

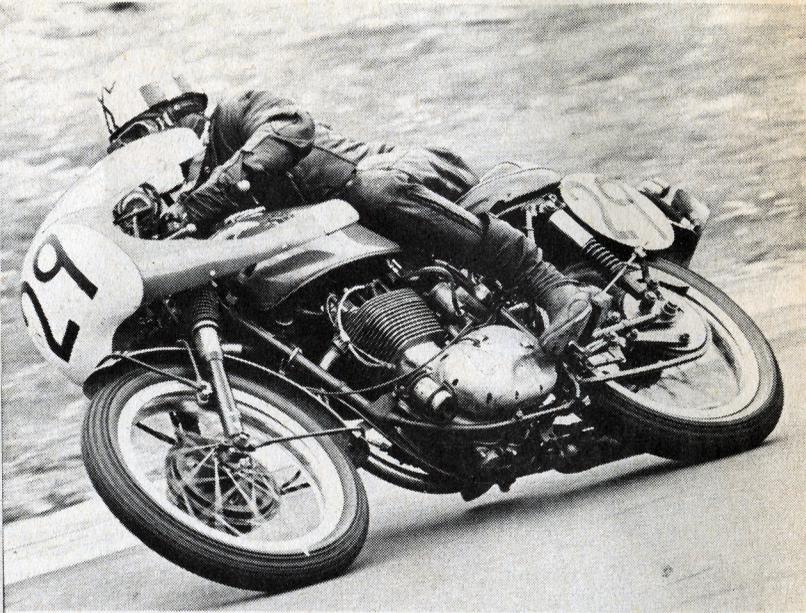
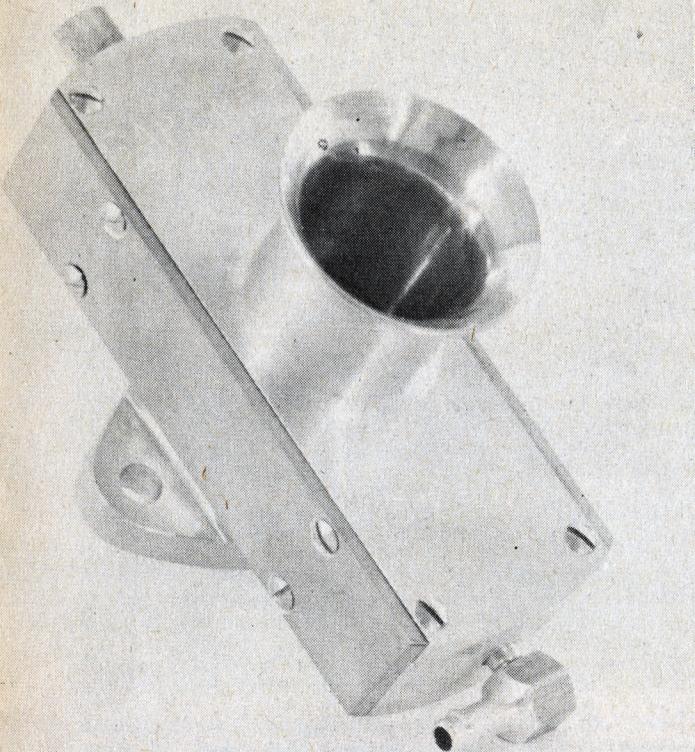
MOTOR CYCLIST

ILLUSTRATED

Three shillings and sixpence

JULY





Author Alan Peck may be remembered for his sterling performance in last year's 500-Miler when, mounted on a 441 cc BSA, he took 28th place overall—singlehanded. For over 6½ hours he circulated his lonely way around Brands Hatch while others rested aching limbs every hour or so.

THE GARDNER CARBURETTER ("... an odd-looking instrument ...")

THE first time I saw a Gardner carburetter was on the way home from a meeting at Snetterton in March last year. We had stopped at a pub for a quick pint in company with John Rollason, who has done a lot of test riding for Gardners, especially in the early stages of road racing development, with a 7R.

John produced a Gardner carburetter for us to scrutinise. I had heard vague reports of the carbs but knew very little about them. It was of a most unconventional design with an oblong body, a flat slide with a complete hole in the centre and detachable, screwed-on plates on either side of the body. The throttle cable was connected to the bottom of the slide and pulled the slide downwards. Only one adjuster was fitted; this was at the top, connected to a flat taper needle and by turning the knob clockwise or opposite, the needle was raised or lowered for optimum mixture setting. The needle itself was positioned plumb in the middle of the induction tract. Due to the basic simplicity of the design and the unusual shape of it, I well remember thinking to myself at the time that it was, indeed, an odd looking instrument.

However, after John had told us about the results that had been achieved my interest was thoroughly aroused. "More power, resulting in better acceleration, a much better fuel consumption, clean pick-up from tickover to full throttle—and starting is a dream", John said, adding "... also, I had a good 200 rpm more along the top straight at Brands on the 7R, but Ron doesn't claim to improve top-end performance although in many instances this has happened. However, he can, in most cases, guarantee better fuel consumption, cleaner carburation and faster acceleration."

Naturally, I was extremely impressed, my interest was aroused to the degree of wishing to try one on my 350 cc Manx—so I asked John if it would be possible.

At that time an instrument had not been tried on a Norton, but Ron Gardner wanted to test one on a 350 cc Manx and John agreed to tell him that I would be prepared to use my machine to undergo a comprehensive test outing at Brands Hatch.

Two weeks later at a meeting at Brands, Rowland James—who is one of the four directors of the Gardner Carburetter Company—contacted me and we had a good discussion about the project. He took down the details after quickly running a rule over various parts of the machine in the vicinity of the carburetter, then declared that they would have to make a one-off instrument to get the right angle of downdraught etc. The length of the induction tract had to be spot-on, not only for the carburation effect but also to clear the cambox.

At this stage I had not had the pleasure of meeting the boss and boffin of the enterprise, Ron Gardner. However, a meeting was arranged and one evening the following week I set off with John Rollason for Burgess Hill where Ron lives.

* * *

After spending a very enjoyable evening at the Gardners' home, I was greatly impressed by everyone, especially Ron who never seems to tire of listening or talking about, motorcycling. He's a real enthusiast, having spent many years connected with the sport, and his knowledgeable, dedicated enthusiasm towards his business of carburation is a tonic to all who come in contact with him. A shrewd man when it comes to business—also a very fair one.

Daphne, Ron's wife, assists in every way possible; always busy making coffee and refreshments for the endless stream of visitors besides attending to the secretarial side of things.

by **ALAN PECK**

Arrangements were made for fitting the carb* to my Norton—also a date set for testing at Brands. The following Sunday afternoon was spent fitting the instrument to the bike, then trying a couple of bump starts in the very restricted space of an underground garage. With a cold engine, on the very first attempt at starting, the motor fired instantly when the clutch was dropped; despite starting and stopping the engine several times, there was no sign of the plug (an RL51 hard, racing type) oiling-up as was usual with the original carburetter. Two paces were enough to get the bike going; usually in the past I had had to take four.

The fact that amazed me was that this was the first time Ron had tried one of his carbs on a Norton racer, yet just blipping the throttle in the workshop, carburation felt smoother. Ron can calculate needle profile and settings for an engine just by consulting all the technical data of the motor itself. Frequently, especially from America, all he has to work on are only the details of an engine and a request of what is required from the carburation, yet customers have been delighted with the results. Occasionally, an instrument comes back for a change of needle profile, or some slight alteration, but this is a rare occurrence. (Anyway, it's always right first or second time).

A midweek practice session at Brands Hatch was selected in favour of the track being less crowded than on a Saturday. After thoroughly warming the bike up in the paddock, I went out onto the track for the real test.

Two laps were enough to know that carburation was well on the rich side. Ron had said it would be, his policy being to start testing over-rich, then work gradually back to the optimum setting; that way is on the safe side but to run weak could result in serious damage if the engine locked up.

A quick stop, needle down one setting, plug back in after reading it and I was away again. Several plug-checks later and a couple or more slight alterations to the needle, then all was set for a true assessment.

* * *

After a few laps I felt sufficiently "in the groove" to get my head down and have a bit of a go. The first thing I noticed was a lot more power at hand coming out of bends; this was more noticeable at Druids, Clearways and especially the uphill run from Paddock Bend to Druids where the rev-counter showed a gain of 400 rpm in third. Normally, on the right gearing along the top straight, I could just see 8000 rpm on the clock in top, before shutting off for Paddock. However, with the Gardner carb, it was nearer 8200 rpm.

So there I was, merrily buzzing round and round the circuit, so engrossed in my riding that I forgot all about Ron. However, as I came towards Paddock Bend for the umpteenth time, I saw this figure jumping up and down waving its arms like a windmill. A closer inspection revealed it to be Ron; he obviously wanted me to come in, so feeling a little guilty for having forgotten to pull in and tell him how the bike was going, I stopped on the following lap.

Apparently, Ron had been signalling to me for three laps before I saw him (Roger Hollands who is my mechanic, has often said he reckoned that I wouldn't see his signals if he jumped into the middle of the track with the biggest pit-board he could lay his hand to!) "Look, you're supposed to be testing a carb, not trying to break the lap record", Ron said anxiously, adding—"Anyway, how's it going?" "Superb," I replied, and gave him the details. He grinned his satisfaction—"Good, now do a few laps and get used to the carb. **Don't** go round like a nut-case, I've had enough kittens already!"

With this mild ticking-off in my ear I set off at a more sedate pace, until the end of the session. Afterwards, Ron told me that he's not happy with anyone going at racing speeds while testing for him—only if circumstances demand an all-out test. He would feel responsible if anything happened to a rider who fell off through trying too hard. Anyway, it's the races that count.

An unusual characteristic of the Gardner carburetter is that from tick-over to a little above half-throttle, more movement of the twist-grip is necessary for the amount of power required, in comparison to conventional carburetters. There is a reason for this; in my opinion, a very good one. When a machine is banked over to a great degree of lean (which is usually on the apex of a tight bend) brute power is not required, for obvious reasons, with most racing carburetters response from the twist-grip in the half-throttle range is very critical. A mite too much wrist movement, especially in the wet, would result in a lurid slide or falling off. However, with the Gardner carb,

it is much easier to apply the right amount of power in the lower range. This is where a new technique is needed. One has to remember to use more wrist movement when circumstances demand more acceleration, at the start of a race for instance—then, by using the twist grip to the full, acceleration is fantastic.

Over half throttle is a very different story. The acceleration continues right up to maximum revs. Again, this is where the Gardner set-up is different; on most carbs the last quarter of a turn on the twist grip produces little response.

Ron's theory of this is simple. As already described vicious power on a tight corner, heeled right over, isn't a good thing, but as you leave the middle of the corner the bike is gradually lifted up, tyre adhesion increases and power is needed to get out of the bend as quickly as possible. This is where the Gardner carburetter really comes into its own—good acceleration is available right up to the next gear change.

It's these small advantages which can give you an edge over your rival, especially in short circuit racing. It's the difference between losing or gaining a length or even a wheel from the last bend to the flag.

I have proved to myself that Ron's theory is a fact. Early last season, before I had Ron's carburetter, in a race at Brands, I was involved in a dice with Tom Phillips, who was Aermacchi mounted. I overtook Tom on the outside round Druids, gaining over a length on him. Then, following the racing line, I moved over to the right-hand side of the track, accelerating away from the bend, intending to get as close to the edge as was possible, to peel off for Bottom Bend. I very nearly rammed Tom as he was almost alongside between the verge and myself; due to the livelier acceleration of his machine, he'd pulled back what I had gained, in 50 yards.

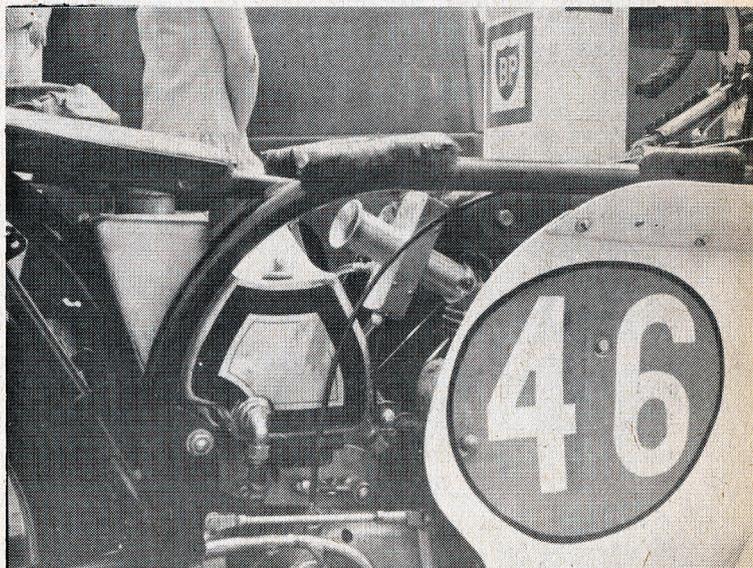
Later in the season, this time with the Gardner fitted, after another Brands "scratch", Mick Andrew told me in the pits after the race that he caught me up going round South Bank, took a slightly different line coming out and expected to draw level with me as we accelerated over the brow, but the Norton left his Aermacchi out of the corner. He admitted that very few Nortons did that. As the saying goes . . . "Proof of the pudding is in the eating!"

* * *

Everyone was pleased with the tests on the Norton and at the Whit Monday Brands International, where I raced the only Norton with a Gardner carb, several people gazed curiously at the unusual instrument. "Funny looking thing, ain't it?", I heard one fellow say to his mate.

Shortly before the 350 cc race, an almighty clap of thunder heralded a torrential downpour. Ron came paddling over to the scrutineers' bay, where I was warming up the bike. He

The first Norton to undergo tests with the Gardner carburetter was, quite naturally, Alan Peck's. Carried away by enthusiasm, he dashed around Brands, totally unseeing the waving arms at Paddock Bend.



passed some remark about the weather being more suited to web-footed fowl than motorcycle racers, when I told him that I was pleased it was raining as I much preferred racing in the wet. He looked amazed and told me to take it easy and not do anything silly. Roger told me after the race that Ron had asked him if I really did like riding in such conditions, or was I "having him on." The former's reply to this did my image no great justice! "Oh! He loves the wet. Still, he's the village idiot, so it's expected of him to be different from others. Don't worry, he never sticks his neck out!"

Grid positions having been determined by practice times, I was fortunate in having a front row position. Down went the flag . . . away went the pack, with Muggins up the front. Having successfully negotiated Paddock Bend I was still in the lead (it was a wonder that I never fell off in surprise). Obviously this was too good to last. Going into the bottom straight, Dave Croxford swept by in a cloud of spray, going through a deep puddle and, obviously not content with "pinching" my short-lived glory, he sent a bow-wave up which caught me broadside and drenched me from head to foot.

In spite of this temporary setback, I was still in second spot at the end of the first lap; a sudden thought struck me. Perhaps everyone else has packed up! This theory was soon to be proved wrong when Kel Carruthers, Gordon Keith, and Pat Mahoney crept past, then displaced Dave Croxford. At the end of the race Carruthers just got the verdict from Keith, Croxford was a lonely third and I managed to get past Pat Mahoney for fourth place, winning £30 in prize money, which bucked me no end. (I hasten to add that Pat had little or no brakes, otherwise it would have been a different tale). Ron was really chuffed with our result even more so because of a good start, a thing I have never, until then, been very good at.

This was the beginning of a very happy association. For the rest of the season we kept the carb on my Norton and the only problem experienced was float-chamber frothing at certain revs, while warming up. This was cured by changing to a larger float chamber.

Several more reasonable results were achieved in spite of retirements through silly things like punctures, clutch slip and oiled plugs on the line (caused by broken piston rings). We had a fifth at the Snetterton International behind Carruthers, John Cooper, Peter Williams and Tony Smith. Again a good start, only being led by Cooper and Williams. Then two wins at a Brands Hatch regional restricted meeting, followed by what I regard to be my best result last season—fourth place at the Brands Hatch national meeting on the short circuit. In a blanket finish with Ron Chandler, Croxford and Ray Pickrell we annexed fourth spot; also, one or two other reasonable places.

Naturally, fitting a Gardner carburetter doesn't transform a rider from mediocrity to a star performer, but it helped me gain results which by my own standards were satisfactory. In fact, until last season I had never broken the 60-second barrier on Brands short circuit, on a 350 cc machine. Then, suddenly, I knocked 1.2 seconds off, to record 58.8 seconds, with more poke out of bends and up Pilgrims Rise provided by the new carb which helped to knock off those vital tenths of a second.

Until now I have related my own experiences with the Gardner Carburetter Company; there are many others who have had a helping hand, resulting in success. In fact there is an intriguing story behind the whole set-up; so, like all stories; as told by Ron Gardner himself, let's start at . . . the beginning.

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"In 1946, my first interest in carburation arose through pool petrol being in use. My father, Alf Gardner, had experimented with positive feed devices; I concentrated on water injection, to try and improve performance but mainly for economy. The results achieved were encouraging. Then I decided to convert a water injector into a petrol injector, for using this gave a noticeable improvement.

"Some time after, I lost interest in carburation, through studying desmodromics. For several months I experimented by converting standard valve gear into desmodromic (when the valves are pushed down and up mechanically and do not rely on springs, as is usual practice for closing) on a variety of road machines.

"One of these was a standard 1938 500 cc Speed Twin. I reversed the head and installed desmo' valve operation. This machine was most successful—in road trim with silencers, maximum speed was 108 mph on 72 octane petrol.

"Petrol rationing came to an end in September of 1947. No petrol was available for private motoring until mid-1948. During this slump period, I built two electric motorcycles and 'an infernal steam contraption' (the latter eventually blew up and the project was abandoned). The electric models were slightly more successful. The big drawback was the weight of the machines, which were too heavy for the power produced, so they were confined to short journeys.

"One of these was a converted Corgi. Top speed 15 mph with maximum mileage fifteen before a recharge of the battery was necessary. A large, heavy-duty battery was sited where the petrol tank had been; this powered a converted car starter-motor which in turn drove the rear wheel.

"The other model was a Douglas. This had four batteries mounted transversely, a three-speed gearbox and would do 25 miles before a recharge. Flat-out speed was 35 mph, quick enough to outspeed the dogs in the neighbourhood, which frequently gave chase!

"Petrol once again available, desmo' valve development re-started; the electrically powered projects left the roads, never to be used again. This work continued into the early 1960s; the most successful of a number of models was a Benelli.

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"During this interest in desmodromics, a problem arose concerning carburation. Using hard cams of a very high lift, which shut so quickly that they caused a pressure wave in the induction (this produced substantial fluctuation in the carburation at certain revs), prompted a thorough investigation of carburation in general to overcome the problem.

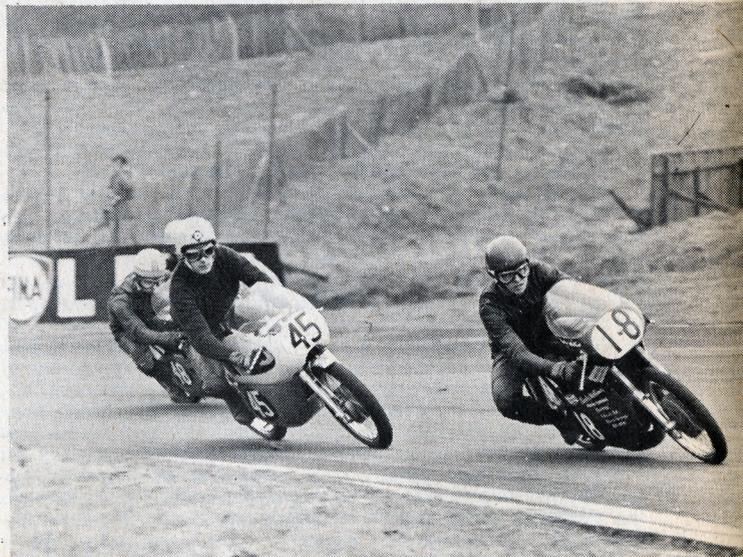
"Then I made a comprehensive study of carburetters, both practical and theoretical; every kind of carb on the market, including car types, obsolete ones, in fact anything which could be of use was carefully investigated.

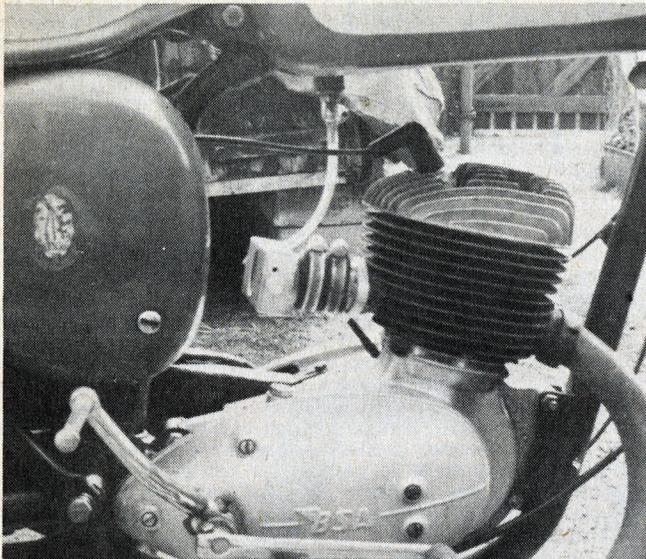
"The conclusions of this exhausting survey, which took a considerable time, was that all the carburetters had some kind of limitations. One of the main conclusions reached was that if certain conditions required a change of main jet, it was possible that a change of needle or a different needle setting or changing the throttle slide cutaway, was also required for optimum performance throughout the rev range; general practice was to change the main jet, then tune the pilot in to suit, ignoring the slide and needle. Our argument was that if it was right for one set of conditions, then it couldn't be right for another, leaving the needle and slide unaltered. Practical testing with racing machines along these lines of thought proved this theory to be correct.

"An idea was then born—to design a carburetter to control the mixture throughout the range, by a needle alone.

"Ablly assisted by Bill Blackbourne throughout all these experiments, we designed and made several types of carbs

" . . . the proof of the pudding is in the eating . . ." Here, gnawing his way around Brands Hatch (where else?), Charles Mortimer, his "Bogull Special" Gardner equipped, leads Dave Browning (Villa) and John Ringwood (MZ) in a March 125 cc race.





Ron Gardner's own Bantam fitted with a very early unit. Simple, when you know how!

and injectors, the outcome of which was a low-pressure fuel injector, fitted to a 125 cc Honda Benly Sports, converted to racing trim and fitted with our own desmo valve operation. This machine was raced very successfully by Mike Cook, whom I sponsored in 1961. Maximum revs of this machine were 14000 rpm—this was a good 2000 more than normal.

"Incidentally, I organised a trip for Mike to race in Russia. He was the first British rider to race there.

"The conclusion reached at the end of the 1961 racing season was that more benefit had been obtained by carburation development than any other single factor. A decision was made to pursue this course and drop all other interests. In 1962, we made even more instruments which were mainly tested on road machines.

"Another important conclusion was reached. The design of our carburetter relied on the needle controlling the mixture, the problem being how to adjust the acceleration compensation accurately and quickly.

"Two more years of hard work, developing, designing and testing followed, culminating in the flat taper needle being used as opposed to a concentric taper needle. This is the basic factor in the design of the Gardner carburetter in its present stage of development. A distinct advantage gained through using this type of needle was the excellent mixing of fuel and air. Proprietary carbs fitted with Gardner needles and jets were tried on a 250 cc Cotton racer with excellent results.

"Towards the end of 1965, Rowland James took over the machining and production side of the project, which resulted in the first 'all Gardner' carb, completely of our own design, which embodied all the lessons learnt from previous experiments. In fact, the carb looked simplicity itself; the outcome of a lot of complicated thinking.

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"We fitted one of these instruments on a 50 cc Honda, ridden by Ray Smith. Tests at Brands Hatch showed such an improvement that Ray had to gear up to avoid over-revving. Reverting back to the original carb, still using the higher gearing, the bike just wouldn't reach peak revs.

"At the last meeting of the 1965 season at Brands, Ray did a little wheelie off the grid and won the race by a convincing margin from George Ashton (who was the recognised 'king' of the fifties at that time).

"After this race, we discovered that the Honda had considerably more fuel left in the tank than usual and a survey on fuel consumption showed a vast improvement in mpg.

"At the start of the 1966 racing season tests were carried out on Frank Higley's Merlin-engined specials, with encouraging results, using our carbs. Rod Scivyer raced one of these models in the Ulster GP. During the first practice session at the Ulster, the Merlin was fitted with a conventional carburetter. Rod failed to qualify and fuel consumption was measured at 28 mpg.

"However, for the second session we fitted one of our carbs with astonishing results. Lap times were 2½ mph quicker, just inside qualifying time. But the amazing fact was the fuel consumption—37 mpg—a gain of 9 mpg and the useable power-band had widened, an important asset on a racing two-stroke.

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"It was at around this time that Kevin Cass accepted a lift on the back of my old Ariel Red Hunter. I forget the circumstances; anyway, the bike was, of course, using one of our carbs. Like most motorcyclists, Kevin wasn't too keen on pillion riding; he told me to take it easy and not to frighten him! So, very sedately, we set off. However, after a short while a remark was passed about the bike being rather a 'gutless wonder' which prompted me to show off the acceleration. Taking a large fistful of twistgrip, I snapped open the throttle. This rapid, unexpected manoeuvre caught my intrepid passenger well and truly unawares, as the formerly docile Ariel was given its head. Poor Kevin finished up sitting on the back mudguard, hanging on to the end of my jacket and shouting for all his worth!

"The outcome of this little escapade so impressed Kevin that he asked if he could try a couple of carburetters on his Bultacos. 'If they could make an old banger go like that, then surely they'll make my racers fly', he reasoned.

"A testing date was arranged; Kevin was delighted with the outcome and a very successful partnership was born. Kevin Cass used our carbs exclusively in 1967 on both his 125 cc and 250 cc machines, with outstanding results. He won at circuits all over the country, setting several lap and race records in the process. In the Ulster GP his machine was the fastest timed of the privately entered bikes in the 125 cc class.

"It was then decided, after 12 years of carburetter development, to form the Gardner Carburetter Company and go into production. There are three other directors of the company: Rowland James, Alan Tancred and Geoff Tancred—all are active motorcyclists.

"Production commenced in April last year; we have sold our products all over the world—the USA, Sweden, Holland, Germany, Australia and many other countries. Successes are being notched up in racing at short circuits in most countries; Kevin Cass is still winning races in his native Australia, and he's the main importer for Aussie. Reg Pridmore won the American 500 cc AFM championship. Power Research Team, also in the USA, have chalked up numerous wins and places, using our carbs on all their bikes. They handle the main importing in America. Hugh Anderson is the main agent in Holland and he uses a Gardner carb on his grass bike.

"Users in Great Britain include Grant Gibson (who was runner-up in the 125 cc British championship); Ron Chandler, who helped us a great deal test riding; Dave Simmonds, who is testing them on his Kawasaki; Bernard Judd and Ian Dyson who both did well in club meetings; Geoff Monty is another who is impressed—he has one on his Greeves Silverstone, ridden by Roy Francis; Charles Mortimer is at present leading the British championship in the 125 cc class, and so the list grows longer. Races have been won at go-karting, scrambling etc., and units are in production ready for trials machines.

"Comprehensive development is at present under way with cars. Gardners have been fitted to Minis, a Bedford van, Vauxhall Victor and other popular models. Several units are under test with motorcycle and car companies.

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That is the story of how it all started, in Ron's own words. It brings us more or less up-to-date.

Ron Gardner admits to having little interest in the administration side of the business. "I leave that to the other directors of the company, except when they need help or advice. My main interest is in design and development. Once you get ahead of your contemporaries it's no good standing still and congratulating yourself. Only hard work and constant testing of new ideas can keep you in front."

"These are the words of a man who means what he says, the type of person who does something first and tells people afterwards. His unflagging enthusiasm never fails where lesser men, in the face of seemingly insurmountable technical problems, would throw in the towel. Backed up by the others who have formed the company with Ron, they deserve to succeed. I think we're going to hear a lot more of Gardner carburetters.

Already, Ron has gone much further into the development of carburation than has been described in this article, but for the present, that's a secret—and probably another story . . .