Blown, Not

Two-stroke Enthusiast's Remarkable Scott : A Machine with Forced Induction, Good Road Manners and a Performance Right Out of the Ordinary

By "TORRENS"

While a "bump"-start, such as Mr. Graham Kirk is demonstrating, is the usual practice, there being no kick-starter, the engine can be started quite easily by pulling round the back wheel with second gear engaged and the machine on the rear stand

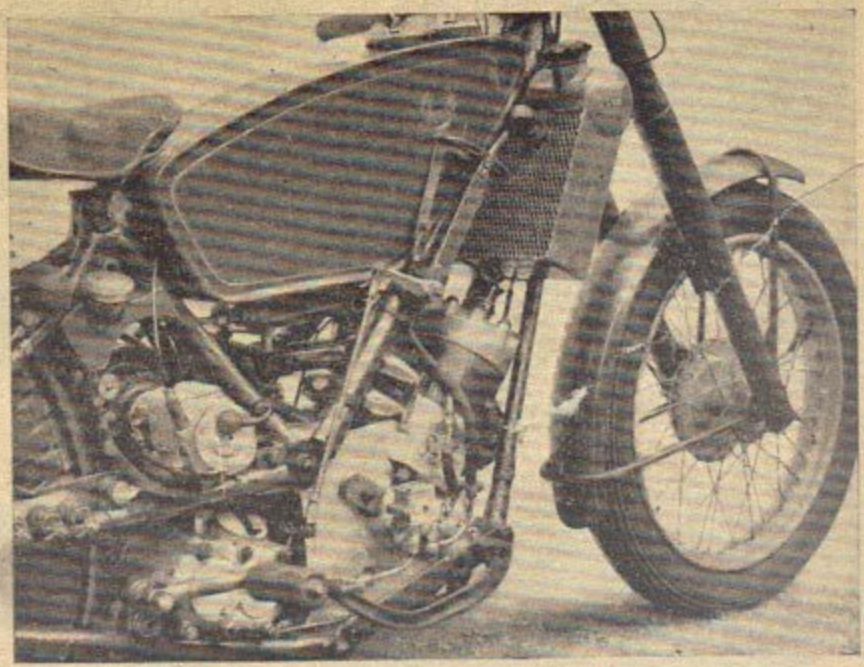
ELEVEN words seemed to stand out from the blue-coloured notepaper. They read: "I wondered if you would be interested in my supercharged Scott." Would I be interested in a blown Scott? Ye gods! Wouldn't you—all of you? And implicit in the invitation was a *ride*.

So a few days ago I could be seen zipping north-eastward bound for the home of the Scott enthusiast, Mr. Graham Kirk. It was arranged that I should pick up another two-stroke lover en route, Mr. Victor Connell, of the two-stroke that never four-strokes fame. I was due to meet the latter in Ipswich just before 11 a.m

Cruising at 65

Such is enthusiasm that well before ten o'clock on this glorious August morn I was there. A cup of coffee and off on the forty-something miles to Norwich, with Mr. Connell leading the way—not on the "Victor," which he sold some time ago, but a brand-new looking 500 c.c. "Luxus" D.K.W., the job with a self-starter. There was plenty of time to get to Mr. Kirk by the appointed hour, he said; cruise a little over fifty and it would be easy. On the open road I noticed, however, that sixty five seemed more his mark.

Waiting for us at his garage was Mr. Graham Kirk, large, beaming, overflowing with enthusiasm. In the garage were a pair of B.M.W.s, the first 1939 Clubman Special which Scott's made, a 344 c.c. Francis-Barnett "Pullman," a 684 c.c. D.K.W. two-stroke-engined car and a couple of those rather spidery autocycles one sees on the Continent. Later I was to be shown 2.5, 6.7 and 10 c.c. two-stroke engines, two 494 c.c. water-cooled D.K.W. two-strokes, another D.K.W. car and a 973 c.c. four-cylinder Elto engine. We talked motor cycles; we talked two-strokes. We lunched talking motor cycles. Then we wended our way to Mr. Kirk's home, he, meantime, telling Mr. Connell that the Scott was not supercharged—that the latter was entirely



The blower and the B.T.-H. T.T.-type magneto are linked by a vernier coupling. The drive is the standard Scott magneto drive

Supercharged

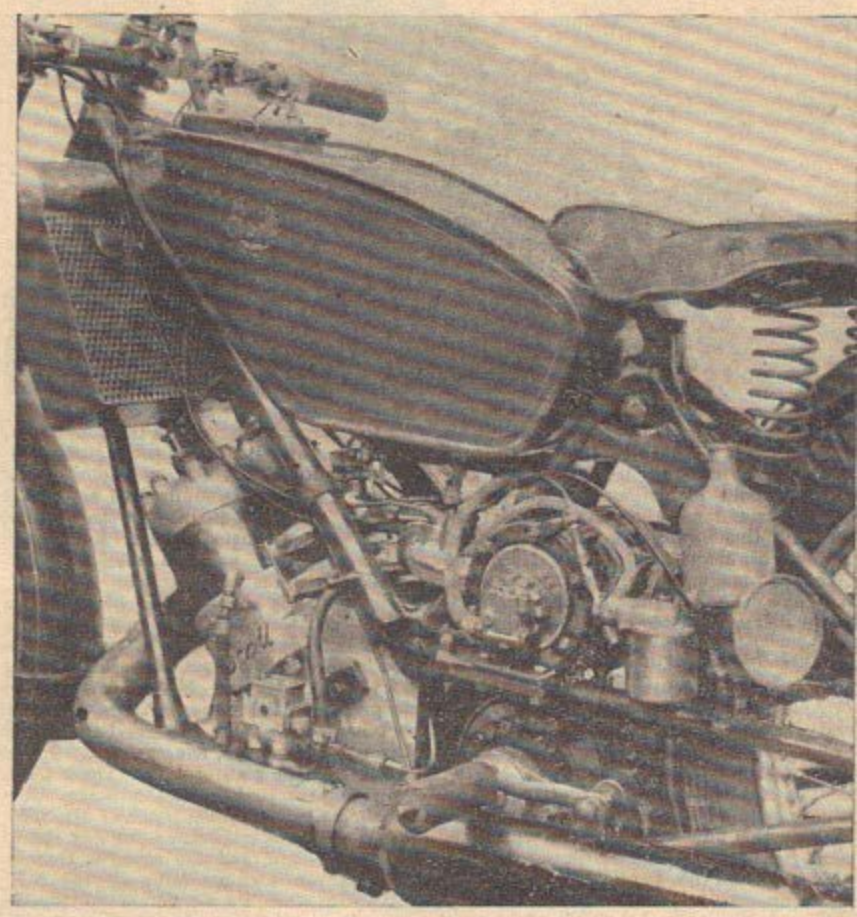
wrong calling it supercharged because the blower had only the same capacity as the engine. Shush! and Mr. Kirk had used the word "supercharged" in that letter to me. I mildly suggested that the word "blown" or the phrase "forced induction" might be employed, and mentally wondered whether the 550 c.c. mentioned as the output of the blower had to be divided between the pair of Scott cylinders—560 c.c. into 596 c.c—or could be construed as all going to one 298 c.c. cylinder. Later I was to find that the Cozette with its output of 560 c.c. per rev. was geared at engine speed and, as a Scott fires twice per revolution, it was a matter of 560 c.c. for 596 c.c. If Mr. Kirk fitted his 498 c.c. pistons and cylinders then there would be a slightly extra dosage!

They Give the Answer

Already Mr. Kirk had been impressing on me that his Scott was no "Victor"—that for the ten years he had had it the machine had been used as an experimental bus and there was not the workmanship and finish of a "Victor." All I am going to say about Mr. Kirk's handiwork is, "Take a close look at the photographs!"

Every picture tells a story? Only the front pair of plugs are "tourers"; the two rear pairs are different types of racing plug

On arrival, we very soon had the rakish red, gold and silver beastie out in the drive. "Rakish" is the word; there is something suggestive of a 100 per cent. dicer about the machine. It looks rorty and naughty. Of course, my eyes went to that row of sparking plugs with attendant spanner mounted neatly, yet firmly, in rubber sheeting just above. Every picture tells a story? I was to find that the forward pair were for normal road use—K.L.G. 583s of standard reach—next long-reach, detachable-centre, copper central-electrode 268 racing K.L.G.s and lastly, a pair of long-reach 356s, "non-detachable" and only suitable for flat-out work. Once, I learnt, the 268s had been used in and around the city—by



How the six-vane Cozette blower and S.U. carburettor are fitted. The little pipe running upwards from the front end of the silencer is for checking back pressure

mistake—and the engine, in addition to starting up on them all right, had not oiled them up.

The machine is a 1928 T.T. model, one of the actual T.T. machines, fitted with a standard 596 c.c. Power Plus long-stroke T.T.-type engine—standard, that is, if we forget the lightened connecting-rods and lightweight gudgeon pins and the fact that the cylinders have been bored out 20 thou. The engine has a 1930 lower half and a cylinder block that was bought over the counter at Scott's. Mr. Kirk has also the original T.T. cylinder block, so can drop to 498 c.c. whenever he wishes.

Glancing over the machine I automatically noted three neat little transfers, two on the engine and another on the steering head—"SUPERCHARGED!"

How has he arranged the blower and how does it "blow?" Originally, Mr. Kirk tried coupling the blower to the crankcases, but the results were only so-so. The final arrangement is to pass the mixture straight into the combustion chambers via a U-shaped manifold and the upper transfer ports—the ports through which, with the engine in crankcase-compression form, the gas enters the cylinders. By cutting out crankcase compression and aspiration Mr. Kirk imagines that he has very nearly balanced the power absorbed by the Cozette No. 4 vane-type blower.

What It Has Cost

The whole arrangement is delightfully simple, but the results, of course, have only been achieved after considerable experiment and much money. The original machine cost £14 10s, but if time as well as outgoings were counted, the total cost, he estimates, would be some twenty times this—somewhere around £300.

As will be seen from the photographs, the blower is mounted on the near side roughly over the gear box and lies between the rear mudguard and the twin seat stays. The platform is fashioned

The engine warmed up, "Torrens" waits while Mr. Kirk changes the plugs for a racing type

out of ¼in. mild-steel plate, cut away for lightness. The advantages of using such thick material were rigidity and that it could be drilled and tapped to take the standard Scott magneto-platform screws, thus retaining the standard method of chain adjusment. Even the standard magneto drive is employed, but now the ½ × ¼in. Renold "Elite" chain drives both blower and magneto.

Not Recommended, but Works

It is not, of course, the size of chain that is officially recommended for such duty, but there is a snag about employing a wider chain in that it would be necessary to reduce the width of the Scott's central flywheel, cutting away some of its off-side. One day Mr. Kirk may do this and have a pair of sprockets made up, but the fact is that so far the chain, for all its small dimensions, has stood up.

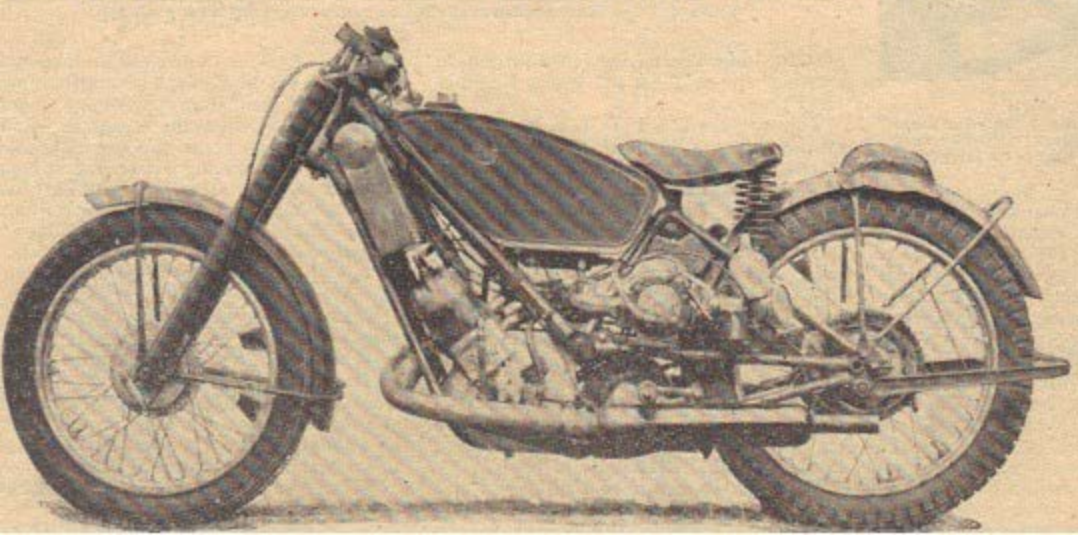
The driving sprocket is fixed directly on the blower spindle by a taper and key, while in line with the blower, on the off-side, is the B.T-H. T.T. magneto, driven through a vernier coupling off an Austin Seven. Over the chain goes the original Scott magneto-chain shield. As already inferred, there are the standard 20T driving and driven sprockets.

Immediately behind the blower is a mighty S.U. carburetter, one of a trio off a 1920 Speed Twenty Alvis. This is too large for its present purpose according to the makers, and Mr. Kirk considers it probable that better results would be obtained with a smaller carburettor of the same make, say, one with a 1¼in. bore instead of the present 1⅜in. There were, however, two reasons for the choice. One, of course, was availability, and Mr. Kirk has a pair of carburettors for any spares he may desire, and the other is that he wanted the vacuum valve of the S.U. never to reach its maximum position so that he would be sure of a constantly variable mixture over the total range of revs. per minute.

A short elbow is mounted between the carburettor and the blower in order to set the former out at an angle of about 40 degrees; thereby it clears the rear-wheel assembly, yet is tucked in as far as possible. The float chamber had to be set at an angle, too—at an angle to the body of the carburettor so that the chamber was vertical. From the blower there is a curved pipe running forwards and connected to the U-shaped induction manifold by rubber hose and radiator-hose clips. This enables ready adjustment of the chain, it being merely a matter of slackening off one of the clips, setting back the blower-cum-magneto assembly and, finally, tightening up the clip.

A Real Job

Copper tubes are employed for the manifold and for the tract attached to the blower. These are plated, beautifully made and are brazed in the case of the "U" and silver-soldered in the case of that attached to the blower. This pipe-work is one of the very few tasks which Mr. Kirk did not undertake himself; instead he stood over the craftsmen who made them—"got in the way" is the term he used! Counting the further U-manifold which links the two crankcases via the lower pair of transfer ports, thus taking care of the pumping action of the two pistons, one travelling up and the other down, the cost of this side alone was some £10. However, the fact remains that they are a real job. The pipe is of 1⅜in. diameter, and the total distance from blower outlet to cylinder port is approximately 14½in. A blow-off valve is fitted in the U that feeds the cylinders in order to take care of any backfire, though there has been no bother in this regard, I gather. From the rear portion of this induction system there is a little pipe leading to a gauge mounted on the top of the off-side leg of the Matchless "Teledraulic" front forks. This, and its opposite number—the similar gauge mounted on the other leg and connected to the front



Mr. Graham Kirk's "blown" Scott in all its glory. Thanks to the blower it is possible to run with an extremely rich carburettor setting without any four-stroking. The cooling effect of a rich mixture Mr. Kirk adduces as the reason why the engine does not—apparently, will not—seize

portion of the Burgess silencer to check back pressure—are Eureka oil-pressure gauges. Mr. Kirk was not able to obtain a boost gauge. They give a positive reading, of course, and show up to 10 lb./sq. in. Almost needless to say, a plate has been fitted to blank off the flanged inlet port of the engine in its standard form.

A Cocktail Mixture!

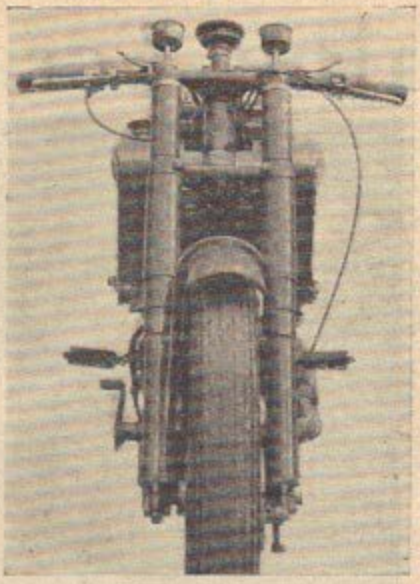
A point which may surprise many is that the power unit runs on both Castrol R—the castor-base racing oil—and Mobiloil D, using both at the same time. Mobiloil D is employed in the proportion of a quarter of a pint to a gallon of petrol in order to lubricate the vanes of the blower, while Castrol R is fed to the engine *via* the twin duplex Pilgrim pumps, which are mounted one on each crankcase door, and to the blower by the little Best and Lloyd oil pump that is fixed on the end of the blower casing. One other task for which "D" is used is that of drip-feed for the chain which drives the blower and the magneto; there is a little tank for this beneath the saddle, in the vee between the chain and seat stays. How does the R and D cocktail work out in practice? Perfectly, says Mr. Kirk.

By employing two duplex Pilgrims, one on each side of the power unit, which is the practice on the latest Clubman Special, Mr. Kirk has been able to avoid having an oil pipe crossing from one side of the engine to the other and crossing, en route, the chains. One feed of each pump goes to the cylinder walls and the other to the main bearings, in the normal manner. Only a small oil feed is found necessary and, as I was to note later, the exhaust is pleasantly free from smoke or smell. I will not argue whether the odour of "R" is nectar or not!

Cylinder Block Details

Two other points must be mentioned before I pass on from matters concerning the power plant. One is that the old 2in. diameter exhaust pipe is retained, and the other is that, the cylinder block being in a poor state, Mr. Kirk has indulged in the convenience of screws, in place of studs, for fixing the cylinder-head casting, which means that the latter can be removed without disturbing the radiator. The screws are of high-tensile variety. With a perfect cylinder block he would have kept the standard studs so as not to wear the threads cut in the block. Incidentally, by plugging the oil pipe that runs to the near-side pump he can detach the inlet manifold—do so without removing the fuel tank.

A hand gear change has been retained. Foot change was fitted for a period, but, like many another Scott owner, Mr. Kirk takes delight in slipping his left hand across the tank and snicking in the desired gear, doing so on the throttle. A magneto cut-out is fitted. This is operated by a Bosch horn push mounted beside the twist-grip throttle and neatly built into the clip of the front brake lever; it is there in



A frontal view showing the "Teledraulic" forks and the extent to which the magneto and supercharger protrude

case the throttle jams owing to, say, ice in cold weather. The gears are standard. A 22T. driving sprocket is fitted, giving ratios of 4.4, 5.5, and 7.75 to 1. The stronger T.T.-type clutch springs are employed.

Handlebars are of the almost-straight, Vincent-H.R.D. type (than which I know none better). On the off-side bar there is a single lever of air-lever type opening outwards to operate the variable jet. The rear brake pedal is on the right, so, the brake itself being on the right, there is straight-line operation. Another not very obvious feature is a Dunlop "Drilastic" saddle supplied specially to fit the model.

Fitting the "Teledraulics"

The forks are the standard "Teledraulics" such as are fitted to the Matchless W.D. three-fifty, but with heavier oil in the legs. The weight of the Scott is much the same as the Matchless—it is 364 lb. with radiator filled and two gallons in the tank—but there is a fair weight on the front wheel in the case of this Scott. Mr. Kirk is large and weighs nearly 19 stone. Recently he checked the weight on the front wheel and found it to be, with him aboard, 287 lb. The only modifications that proved necessary in order to fit the forks to the Scott and at the same time retain the standard Scott taper-roller steering-head bearings, was machining away the flange at the bottom of the head stem and a little off the top member so that it would drop over the Scott head. The standard Matchless wheel is employed, but with a 3.25-19 ribbed front tyre. The wheels are finished in silver so the *tout ensemble*, as I say, is red lined in gold, plus silver. The wheels have been balanced; previous to doing this the handling over 70 m.p.h., Mr. Kirk says, was not too good.

What is the performance of the machine like? I did ten or a dozen miles on it. Mr. Victor Connell also had a flip on it. His comment was, "Do about 45 on it; then it runs away with you!" He said various other things—in regard to the many children about and the almost frightening power. My comment is, "What a marvellous beastie!" Never have I ridden anything quite like it. At small throttle openings it remains a gentle potter-bus, and I was not at all surprised that its owner takes it through the City of Norwich. It is a most mannerly machine, and its two-stroking is excellent.

Almost "Devilish" Power

Open up in bottom, second or even top, however, and the way the engine builds up is extraordinary. The power does not come in all of a sudden, like a megaphone, equipped T.T. four-stroke—the arrival of a dozen horses which were not there a few revs down the scale—but there is ever more power as the revs mount; I almost said devilish power. There is a lot of devil about this machine, and I would love to see an actual power curve taken from the blown engine. Mr. Kirk, you have developed a very remarkable job and, I feel, point a way in which, so far as sports models are concerned, many will trend.

My trio of short runs—or was it a quartet?—were only sufficient to learn a little. What is needed with a machine so fast is a long run, such as to Donington and back, which was a trip Mr. Kirk undertook when he was blowing the engine *via* the crankcases—anyhow a good distance and roads that are traffic-free and "known."

Engine Likes the Mixture

Starting was easy—a bump start, for there is no kick-starter—and there were no tricks of the trade. The exhaust was very much that of a Scott in the Island. My legs, I found, came against the blower end in one case and the magneto in the other; the new T.T.-type magneto is longer than the one it has just replaced. The mixture, a little on the rich side apparently, was such that there was absolutely clean opening up. It seemed obvious that the blower gives a homogeneous mixture very much to the engine's liking. Except for the power, one would not know that a blower is fitted. There is no noticeable noise from it. The handling of the machine is good, barring that the brakes did not come up to scratch; the rear one had obviously got oil on its linings.

Maybe one day it will be possible to have a really extended run on the machine. What will she do to the gallon if and when that time arrives? Mr. Kirk tells me that cruising at about 60 m.p.h. it covers approximately 45 miles to the gallon. What is the maximum? He believes a full 100 m.p.h. So do I!