MOTORCYCLE SPORT

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Law Breakers

MOPEDS and under-50 cc motorcycles ridden on the road by 16-year-old provisional licence holders are restricted by law to 30 mph maximum speed but are being ridden at speeds of up to 60 mph after being fitted with tuning kits brought in from Italy.

The easy-to-bolt-on kits consist of a cylinder barrel, a big-bore carburettor and a high compression head and sell for £80. It is a quirk of law but they are legal both to sell and to fit to machines but it is when the user, usually an inexperienced and untrained rider of 16-17 years, the age group highest in road accidents, takes a machine fitted with "hot" parts on the road that he could run foul of the law for exceeding speed restrictions, having no insurance (as no company issues cover for the tuned tinies), creating noise offence and risking disqualification for up to 12 months for a black stamp conviction on all three offences.

The man importing and selling the kits is Bernie Adey, from his business at Watford, who showed the tuning parts at his shop and at the Earls Court motorcycle show.

Police who have worked hard to improve road safety of motorcyclists are angry that the high-speed components are being sold at all. A spokesman said, "It is totally irresponsible to pretend to sell these tuning parts only to boys who say they will use their machines only in off-road events organised by clubs. Some undoubtedly will, but there are ready made and tuned specialist off-road bikes available and these could not be beaten in a scramble by souping up an ordinary 50 cc road bike or moped, which is what the imported parts are made for".

The police warn that riders using tuning kits render themselves liable for prosecution when caught on the road. Bob Ainsworth, head of Devitt (DA Insurance) Ltd, Britain's leading motorcycle insurance company, has said, "A policy issued for a moped or mini bike is null and void if the machine is made illegal by the fitting of a tuning kit. We could only insure such a bike if it was ridden by the holder of a full motorcycle licence and the bike's technical changes had been declared to us". Devitts have withdrawn their agency from Mr. Adey's motorcycle shop in consequence of his sales of tuning kits.

Manufacturers' guarantees are invalidated if tuning kits are fitted during the guarantee period.

Mr. Adey is unrepentant, however, and says, "We have no control over what buyers do with the kits but I try to warn all boys not to use them on the road". He expects to sell about 100 kits this year. We hope he will be proved wrong.

Mike Hailwood, who seemed to be a special guest on almost every stand during the opening day of the Earls Court Show, poses with Scott on the VMCC display

Front Cover Picture

All-rounder Phil Read moto-crossing in a Super Six competition at Donington. The one-time road-race champion talks about his liking for the "music" of a four-stroke — preferably MV Agusta — in "Some People" in this issue

CHASSIS AND SUSPENSION

Why have we taken so long to arrive at our present stage of development? Have we got it right for the 1980s?

OUR four-wheeled brethren lagged behind the very early two-wheelers with their coil spring, leading- and trailing-link suspension innovations, but cars these days are usually far more sophisticated, with hydroelastic, pneumatic and hydraulic arrangements — even the Vincent three-wheeler of the 50s car had triangulated cantilever monoshock rear suspension five years ahead of the Series D monoshock, which itself was 20 years ahead of its time.

However, just before we arrive in the 80s there appears to be a glimmer of hope for modern (two-wheeler) machinery: gas and air-filled monoshock, cantilever taper-rolling-bearing rear ends and air-filled telescopic forks have arrived. Even mighty Honda have finally gone the same way with their new racer.

Velocette and Vincent, both out of production, featured these systems for many years, Velo's oleomatics being particularly effective, as many readeers will already know.

World championships on road and rough now fall to bikes with these latest revivals of yesteryear's systems.

Why did it take so long to recognise the best way to do things? I will not bore you with the Vincent story, but had they managed to win the TT in the mid-30s the industry might well have got it right 40-odd years ago. It was engines and, with no disrespect, possibly riders (the best jockeys rode Nortons and the other big names) that robbed Vincents of any TT successes; it was nothing to do with the rear suspension.

It was not until the 1948 Clubmans TT that the potential of today's most modern suspension was successfully demonstrated in the Isle of Man, when post-war big twins from Stevenage using pre-war cantiliver rear suspension and front forks cruised round to fill most of the first 10 places. As one of the leader-board jockeys of those days, I could only watch the inch or so travel of the Garden Gate Nortons, as they with their magnificent engines and riders leapt uncomfortably from bump to bump, with amazement as they won race after race. How much quicker they would have been (and were in 1950) if they had gone the Vincent or Velo way.

My consternation was the greater as I had ridden against the works Nortons at Donington in 1938/9 on a swinging-arm Manx, brain child of Geoff Nantes, racer and tuner, with whom I worked in East Leake, Notts. My picture shows how this ex-Jock Forbes 350 Manx rigid frame was cut and spread to carry the spring cases, a 1½ x 1½ in steel pivot member being brazed close to the gearbox, to carry the swinging arm, which pivoted on a gudgeon pin and passed through a slot in the spring case, sandwiched between two springs. With no hydraulics available, it was not up to today's standards but was clearly superior to the normal plunger arrangement of the time.

Geoff, who also welded square fins to the head and barrel, lives in Dorset these days and campaigns a rigid framed (?) MAC Velo in vintage racing, although he is close to retirement age, like our old friend since those early days, Titch Allen.

Sir William Lyons' (racer, sidecar maker, Jaguar chief) choice of front fork for his Harley Davidson

The same Norton finished up with an Aspin rotary valve head during the war . . . but that's another story.

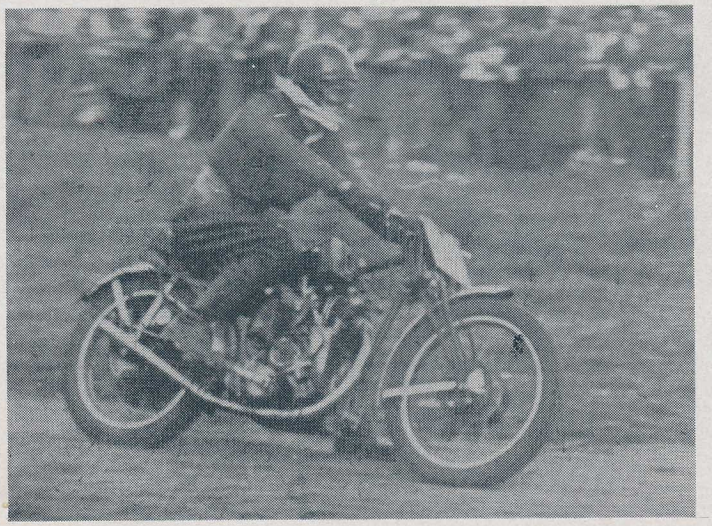
The racing successes of Norton undoubtedly prolonged the life of the highly inefficient "sprung heel" and encouraged BSA and many others to follow suit, before they all went the Velo way; only now are they, which currently means the Japanese, of course, going the whole way to monoshock . . . Velo's lean-down shocks, the "half-way" stage, is retained by the more cautious.

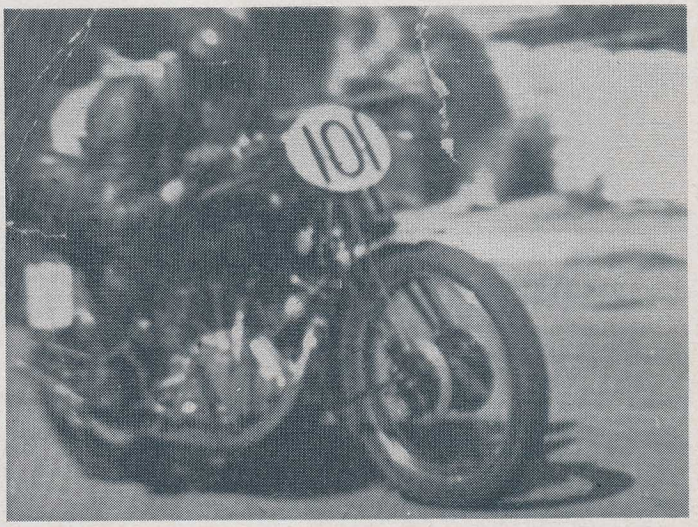
Nineteen-seventy-nine has seen manufacturers across the world unashamedly re-introducing all the features those two magic Vees used for years: chassis utilizing the bower unit as a main structure member; monocoque incorporating the oil tank and fuel tank, à la Ariel Leader and Vincent — there's even the black and gold paint finish to engines as well as chassis.

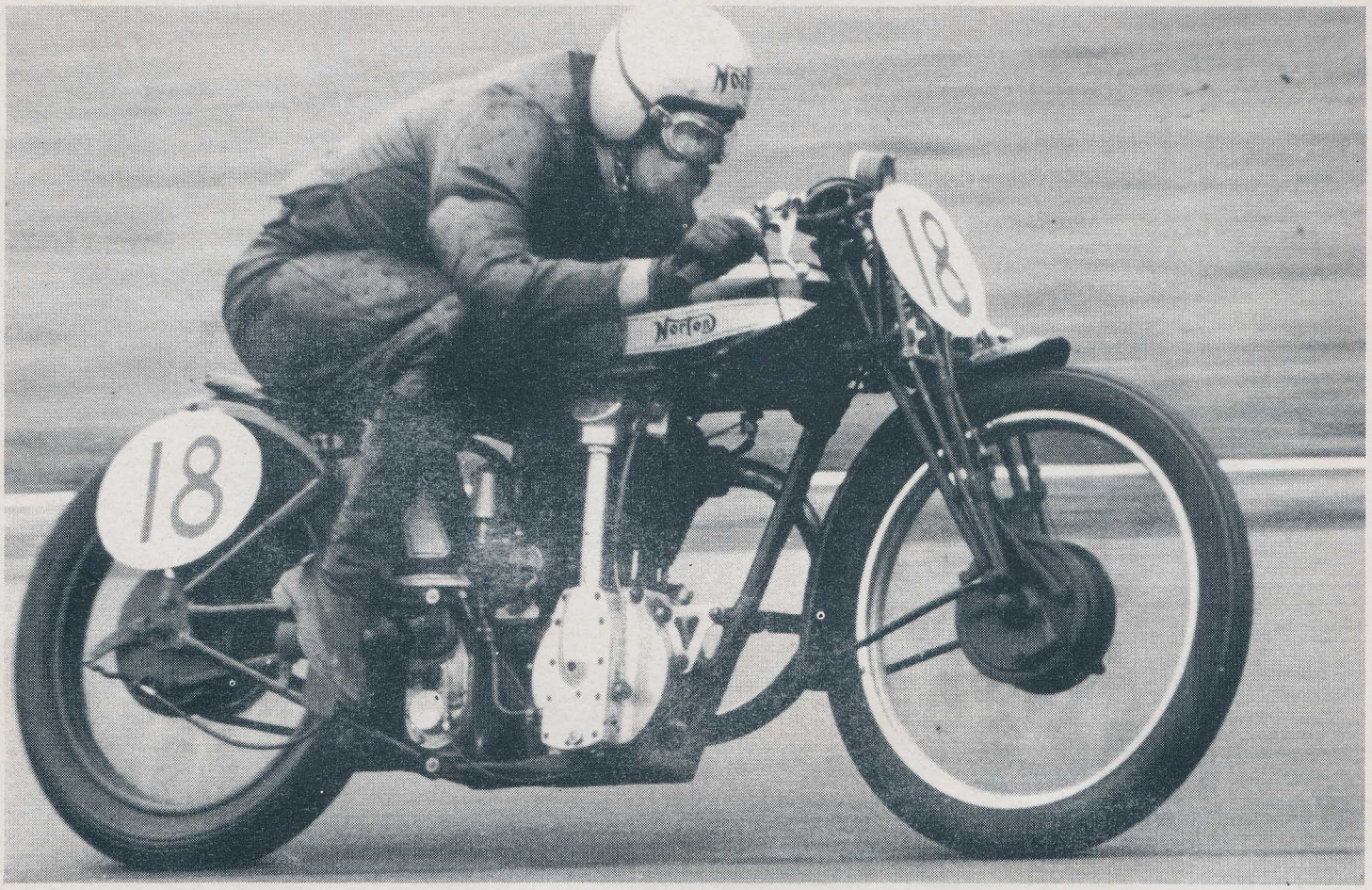
Although it must always be borne in mind that no suspension will rectify a weak chassis, a monocoque is clearly the stiffest set up, the "bolide" referred to later in this article being a good example, some 12 times stiffer than the Triumph Triple's original frame. Any flexing in any part of the running gear of a two-wheeler is extremely undesirable, as is a high centre of gravity — but more about this later.

For the super-comfortable tourer of the future, I can see ultra-lightweight unsprung parts controlled by an automatically pumped-up system similar to the Citröen car's. Ground clearance would be preset easily, as would be the load-carrying capacity, again as in the Citröen, which operates well with relatively little

Above: Monoshock for the Silver Dream. Below, left: Grass racing with a spring-frame Vincent HRD Replica (almost unheard of then, in 1947, when rigid frames were established style). Below, right: June 1948 — Rapide in the Island, timed at 126 mph. Brampton forks, undamped rear end







trouble in spite of its complexity.

As front and rear suspension should be designed as a whole, some form of hub-steering would seem desirable, even though aesthetically it is a disaster. Enclosure could be the answer, ultimately.

An early example of hub-steering, the 1920s Ner-a-Car with its low overall centre of gravity, a must on any 1980s bike, could be ridden to a standstill feet up and its handlebars could almost be dispensed with at speed.

Questions remain. One: How do you incorporate reasonable-travel suspension with hub-steering without the whole lot looking like the Forth Bridge?

Alternative front ends come a-plenty: plunger, trailing- and leading-link, Earles type, Castle, Girdraulics and, of course, time-honoured girders with lower link and central springs and, latterly a central spring-and-hydraulic unit, a Webb conversion using a Woodhead Monroe unit. This last arrangement gives nice control at speed on Island-type going while still retaining a Vintage feel and appearance.

For all types of motorcycling except trials and scrambling, where extra-long soft travel excels, I still rate these beautifully light and graceful pre-war forks very highly, light and responsive in traffic and predictable and largely vice free at high speed.

Records close to 200 mph including the world's solo and sidecar, have fallen to machines with girder and Girdraulic forks, a front-wheel suspension which varies trail and head angle the least of most front-end designs.

However, telescopic forks still have some way to go. Stiffer lower legs, possibly linked together, lower and wider-spaced bearing head lugs, with larger-diameter stanchions, together with much stiffer yokes, will all help; even external springs give more scope for improved hydraulics and rapid spring changes for different conditions. My guess is that teles will be with us for many years with their long, soft-travel capability, even it they have little else to commend them apart from their eye appeal.

If, as I think, we must eventually, accept shaft drive as standard, then an inboard disc brake close up to the pivot point would help reduce unsprung weight, as would a single-disc, multiple-caliper front brake.

Solid tyres may well be feasible with improved suspension and synthetic materials, using only

Above: Girder front forks at their very best — as used on racing Nortons in the 1930s (this particular Norton, a CS1, happens to be late 20s) and Velocettes up to the 1950s. Having short, "sharp" travel, girders were no great shakes in the comfort department but gave precise, light steering. Below: The writer on a "short-tele" ex-works plunger-frame Norton fitted with Triumph Grand Prix engine. It was, he recalls, quick but unreliable. A connecting rod broke during this 1949 Cadwell Park outing. Right: T.D. again, this time with Ernie Allan in the 1954 Sidecar TT: the outfit is a Matchless G45 with telescopic fork and pivoted-fork rear end and Canterbury sidecar

half the material and eliminating the possibility of punctures, and not requiring clearance for growth at high speeds.

After all, having gone back to artillery wheels, why not solid tyres?

Before leaving telescopic forks, I would remind readers that it is only the front-wheel spindle that stops those legs a-walking — so be sure it's tight!

Smaller wheels have many advantages. They are light, stiff and bring down the C of G. Wider-section rims are preferable too, putting more rubber on the road.

I pioneered 16 in wheels in the Island, albeit in a racing chair with sidecar-wheel springing, but it showed little if any benefit, although my comfort-loving passenger was quite impressed. For a touring outfit sidecar suspension is a must, particularly if all three wheels are equipped with brakes.

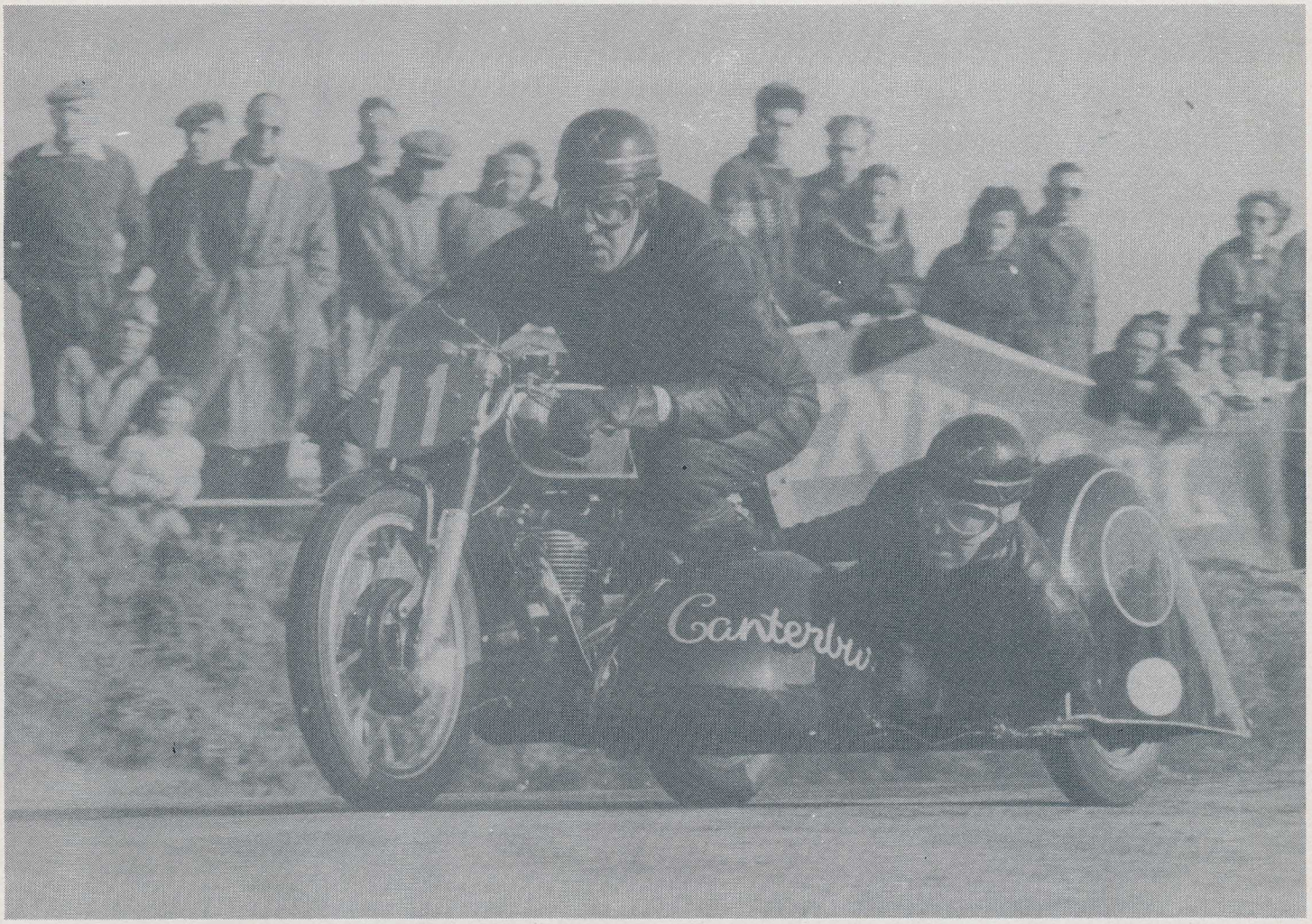
Which brings me to what must surely soon arrive — hydraulic brakes having a tiny hydraulic motor as an integral part of the hub with a built-in anti-skid device. Friction brakes, be they drum, cone or disc, are still primitive, little removed from a wood block pressing on a wagon wheel — some discs even feel like that! Just as friction dampers had to give way to hydraulics, so will friction brakes one day.

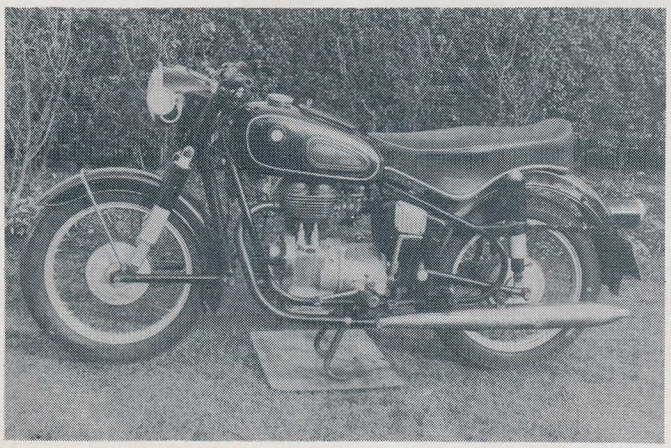
Hydraulic retarders have, of course, been used for years in many applications. A chassis and rear-suspension layout that justifies inclusion here is that employed on the "bolide", Edward Mathews' brainchild, which is of monocoque construction. The cantilever rear-end compresses a rubber cone, sited under the gearbox, with two gas-filled dampers in tension similarly positioned.

The rubber cone is very progressive, soft initially, hard finally, the legs are, as is the whole construction, in box-section steel and are immensely rigid.

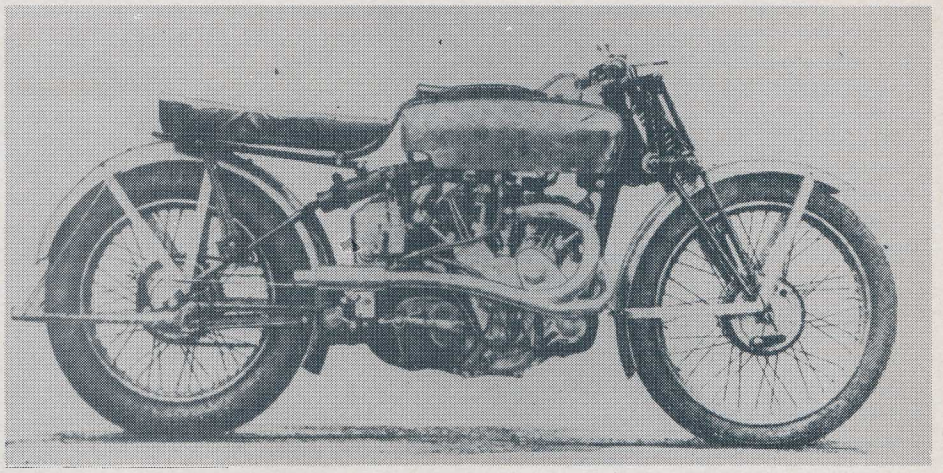
Riding impressions of this Ceriani-forked Triumph Triple-powered device at Silverstone and in City driving were most impressive (more of the machine in a later article).

The low centre of gravity, and the single-disc, magnesium wheels helping to keep weight down to less that 400 lb made for a taut, confidence-inspiring motorcycle with a lot of potential.

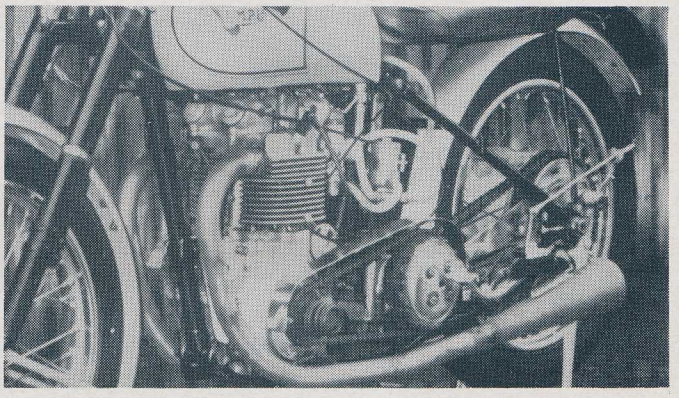




Lower pictures show BMW with Earles-type front fork and short-movement rear pivoted fork, and the writer's 11-year-old grandson starting his riding career on a monoshock Z80 Yamaha. His brothers have conventionally sprung Suzuki and Honda and get a much rougher ride



Above: Pre-war spring-frame road-racing 998 Vincent-HRD as prepared for the Dublin 100; later this machine, ridden by Ginger Wood, became a Donington lap-record-holder. Left: Long-travel rear suspension on 1979 moto-cross Honda ridden by Andre Malherbe. Below: Runner-up for the rear springing booby prize — Triumph's early post-war sprung hub. Bottom: Monoshock style as shown on Yamaha TZ350



A visit to any scramble circuit, even a schoolboy event, will disclose the increasing use of box-section alloy rear suspension arms, gas- and air-filled shocks, mono or "laydown," wheel travel of up to 10 in, with anything up to four differently sited and types of chain guide all on one machine . . . such are the antics of the poor old chain with huge travel and whippy frames!

A runner-up for the booby prize for rear suspension design was the Triumph sprung hub, again propogated by an Isle of Man success, this time with Fearless Ernie up. I mean, Ernie Lyons, Triumph twin winner of the wet Senior Manx in 1948. This was its first and last major race success, (although, in all fairness, it never had a reliable power unit to help it out). Most GP Triumphs, as they had grown into after Ernie's success, blew up — mine certainly did. Although it was not saddled with the hub, my substitute frame, an ex-works plunger Norton, was nearly as bad, compared with my Series A TT replica Vincent.

Finally, if Triumph were runner-up, who got the booby prize? It was the huge, sky-blue Indian Chief of 1948 vintage with car-size tyres, 1 in-travel plunger rear end, and 6 in-travel buddy seat, complete with tassels. Vincents were commissioned to install a Rapide motor in this monster in 1949 — and how unhappy it looked, compared to its rightful place!

The finished apparition* which I just managed to screw 100 mph out of down hill, down wind, before being apprehend by the arm of the law (the ton being Indian's requirments), felt like a huge jelly with 50 per cent concrete on a silent-night mattress.

This particular activity had government backing as part of the "Export or Die" campaign. As it turned out, Vincents, along with most of the other famous names, did both. T.D.

*If you have an inclination to own one of these travesties, sorry, but it never got into production — fortunately.