

The Next Hurrah

By Phil Schilling

● The Norton vertical twin should have died and gone to legend a generation ago. In world of perfect logic, engine designs should never maunder on for decades and finally be crushed by onrushing technology. Good ideas deserve better. Good engines should go to harvest in the fullness of their autumn; most mechanical things which struggle on simply die cold and wretched in December.

Seasons do not cover England in perfect symmetry. Spring is cold and damp, and so is fall and winter. Onrushing technology there slows; the present walks in cadence with the past. And mechanical things like the Norton twin soldier on and

on . . . through the Fifties . . . into the Sixties . . . and reach the mid-Seventies. In other places, someone would have raised the last hurrah at an earlier stage—when the original 500 twin turned to a 600, or 650, or 750, or 850. But somehow, no matter how deep Norton reaches into December, the final cheer never comes. There's only the next hurrah.

The Norton twin was the handicraft of Bert Hopwood, a name now covered by shadows. Mention British motorcycles and Americans think Triumph. When the past releases one old standard-bearer in British engineering, that ghostly figure belongs to Edward Turner. Turner and the Triumph

Speed Twin, man and machine are linked, one and inseparable. Yet Turner did not act alone in shaping British vertical twins. He was one member of a triumvirate; the others were Bert Hopwood and Valentine Page. Hopwood, Turner and Page all worked together in the early 1930s at the old Ariel factory. In the following years, these three men played a game of musical chairs through the drawing rooms and engineering departments of the British motorcycle industry.

The first Triumph vertical twin bore the stamp of Valentine Page, not Edward Turner. Introduced in 1933 when the world lay scattered in economic ruin,



Page's twin was star-crossed from the beginning. Shortly thereafter, the Triumph motorcycle works changed ownership, and the new regime brought in Edward Turner as the chief designer. Turner snuffed out the Page-engineered bike and created a completely new 500cc vertical twin. His Speed Twin debuted in 1937, a year filled with more prosperity than 1933. Light, elegant and quick, the Turner twin established a thirty-year pattern in motorcycle design.

Valentine Page's name came off the door at Triumph and went back up at Ariel. Bert Hopwood was no longer at Ariel—he had gone to BSA. Eventually Turner showed up at BSA too.

There Turner drew up another vertical twin which reached production after World War II. But the Turner-devised BSA 500 wasn't nearly as successful as the 650 BSA—the A10 Golden Flash—which Hopwood had designed. Finally, BSA phased out Turner's 500, replacing it with a Hopwood brainchild. Meanwhile Valentine Page hadn't been dozing in the Ariel design room—he had engineered the Ariel KH Hunter twin. Then Hopwood bailed out of BSA and moved over to Norton where he became Managing Director. There, on Bracebridge Street in Birmingham, Hopwood laid out the 500 Norton Dominator twin.

And now a quarter-century later, the BSA vertical twins belong to the past and so does the nameplate. The Triumph twin, with its long pedigree reaching back to 1937, has fallen ill to industrial euthanasia. Only the Hopwood twin is alive and well in December.

Backstepping to 1950, you'd recognize the Norton twin in a moment. The engine was different to be sure, but it looks the same. The cylinder head says Norton in every line and form. The pattern is familiar: a single camshaft at the front of the engine drives all the pushrods; the lower-end with center flywheel is a built-up assembly; a separate Norton gearbox with four speeds tucks behind the engine.

The Dominator belonged to the postwar era. The cylinder head, as well as the

cylinder, was cast iron. The Lucas generator sat atop the engine cases in front of the cylinder. The engine displaced 497cc; each 66mm piston ran through 72.6mm strokes. Compression was a gentle 6.7:1—in deference to postwar gasoline, which the Norton mixed with air in a single one-inch carburetor.

The 500 Dominator housed its engine in a plunger frame with "Roadholder" telescopic front forks—a piece of hardware already established in motorcycling history. The 500 Norton twin hardly taxed the running gear. The quarter-mile passed by in 18.25 seconds; later the model would be cracking right along at full bellow in fourth—88 mph.

In following years Norton reframed the 500 Dominator, improved the engine, and dubbed it Dominator 88. In 1956 Norton introduced the Dominator 99—a larger 597cc version of the 88. The 600 engine lived inside the acclaimed Featherbed frame, a duplex design which, like the Roadholder fork, was another spin-off from roadracing. The sales brochures barked out a series of improvements: "engines of higher compression to take full advantage of modern fuels; high lift cams; softer front springing; improved riding position; increased steering lock; better mudguarding; full width hubs on all models; adjustable rear damping units" and "numerous other features which modern technique and fashion demand."

The bore and stroke of the Dominator 88 grew fashionably larger to make the Dominator 99. Norton created an extra 100ccs by opening the bores to 68mm and stroking to 82mm. The 99 worked with 7.4:1 compression while the 88 pressured fuel and air with 7.8:1 ratio. Both were fast motorcycles, and both could stop hard. At the time the brakes were marvels; the 8-inch front brake and the 7-inch rear both had shoes a full 1.25-inch wide.

In 1956 *Cycle* testers found those full width brakes impressive on a test Model 99. But the 600 twin's straight-line performance held the staff's open-mouthed attention; the testers clucked from one column to the next about the top speed—a

dazzling, eye-popping 114.64 mph. By 1956 standards, the 99's quarter-mile performance also rated sideline hand-clapping: 14.71 seconds.

The Featherbed frame wasn't the only home for the 600 twin. In 1957 Norton introduced the Model 77 which used the 600 twin in a simple cradle frame. Intended for sidecar use, the 77 shared its running gear with the more mundane, utilitarian motorcycles in the Norton line-up: the overhead valve 500 and 600cc singles. The 77 was an economy model: magneto ignition, dynamo lighting and very ordinary framing.

The Hopwood twin developed its final Classic Fifties shape in 1958. The headliner twins—the 88 and 99—lost their unsightly Lucas generator bulge. Norton brochures proudly pointed to the "enhanced appearance . . . resulting from electrical improvements." The large tank, shaped like a wide teardrop, blended into the rounded-off saddle; the cigar-shaped mufflers accented the basic curvilinear shapes. Finished off in "polychromatic" gray, the motorcycle possessed just enough brightwork to highlight its quiet elegance. The bikes looked tight, controlled, and powerful. And they were.

Two important things happened to the Hopwood vertical twin in 1961. Norton pumped the engine up to 650cc, dropped it into an export-only "Manxman," and packed the thing off to the United States. The Manxman, calculated to meet the Triumph and BSA 650s head-on in America, arrived resplendent in chrome, cowhorn handlebars and bright blue paint. The Norton engine had not grown with an ounce of grace. Though the 88 (500cc) and 99 (600cc) had been smooth runners, the 650 bared its teeth shaking.

British customers got a better deal. Not only were they spared the Manxman (at least for a while), home-island enthusiasts saw the first 500 Norton racing twin in 1961. Tom Phillis, an Australian rider, tough and gritty and nervy as only Australians can be, flew Norton's "Domiracer 500" around the Island of Man to a third place finish in the Senior. The best thing

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on this street-to-island racer was its new cylinder head, with parallel intake tracts and splayed exhaust ports. The new head, far better than older designs, found its way to the British marketplace in 1962. The new head capped the Dominator 650, which in its Sports Special trim sported twin carburetors.

In America, the 650 Manxman bowed out to the 750 Atlas in 1962. The Atlas was simply a Dominator 99 grown absurd. The bore had gone from 68mm to 73mm; the stroke, already 82mm in the 600, extended to 89mm.

The Atlas was an unhappy motorcycle. If the 650 bared its teeth shaking, the 750 snapped its jaws open in angry vibration and clenched and shook any rider to submission. The Atlas did not merely vibrate nuts and bolts loose. It quaked down highways, seeding the berms with metal. Nor was the Atlas any model of reliability, assuming anyone could steel himself to the task for a long journey.

Bad motorcycles leave permanent bloodstains. Associated Motorcycles, of which Norton was a part, fell down dying in the late 1960s. The Japanese hadn't killed them, much less the Americans or Continentals. AMC managed it all by themselves. Yes, AMC had problems of financing, personnel, distribution, and supply. But fundamentally, AMC's bad motorcycles left the most serious wound, open, bleeding and terminal.

The Hopwood engine survived the death of AMC. Manganese-Bronze cradled the limp body, brought in a rescue team, and revived the Hopwood engine under the Norton-Villiers standards.

There were some "new" parts, such as the new diaphragm clutch pinched off Austin's Mini. And there was a new determination: to use better materials and screw the product together far more carefully. No matter how fettle, the engine was still the child of the 1940s. Summer had passed for the Hopwood twin.

If the engine endured, the Featherbed frame did not. Norton-Villiers couldn't scrap the old engine because they couldn't afford to build a truly new one. So came the ironic part: a new frame to salvage an old engine. The new Norton Commando 750 with its Isolastic system al-

lowed the engine to jitter-bug on its mounts. Only at idle did the vibration attack the rest of the motorcycle; above 2000 rpm the engine vibration was left in splendid isolation. Bob Trigg, who devised the Isolastic system, saved the 20-year-old engine in a single master-stroke of engineering.

The peculiar Norton blend of old and new produced an astonishing vehicle. *Cycle Magazine's* Superbike Comparison Test 1970 revealed that. From a standing start, the Norton Commando blew past the quarter mile marker in 12.69 seconds at 103.68 mph. And the Commando handled too. Even Anglophile die-hards who couldn't mention handling or cornering without launching off into "Featherbed" frames and "Roadholder" forks, applauded the Commando.

In one way, Superbike stars blinded that first Commando generation. The Commando walked a narrow line out the factory gates. Performance—in its reliable, dependable form—had been maximized on the production line. Squeezing more power out of the twin would upset the balance. The 89mm engine, without a center main bearing in its family, would not tolerate 7000-rpm plus. At the seven-level a very short fuse would sparkle in grim anticipation. Standard Commando compression was 8.9:1 to 1; the high-compression pistons elevated the pressure to 10:1 or higher. Fuses shortened. And when a really strung-out 750 Norton hooked up with the optional five-speed gearbox gear teeth would break, or the shells would cultivate hairline cracks, or the rear hubs would develop sympathetic failures. Even Nortons hopped-up at the factory had their woes.

Norton Production Racers, built at the shortlived Andover Performance Shop, earned sheets of epithets: Yellow Submarines, Yellow Perils, Yellow Threshers. On paper, these factory-built cafe racers were marvelous machines. If you got a good one, they did their pedigree justice. If not, you first recalibrated your expectations and then, shortly thereafter, you had the opportunity to rebuild your engine.

Racing the Norton twin was a task best left to Norton-Villiers, and much to their credit, the company quickly realized this. In production racing events in England and on the Continent, Norton marshalled

its full resources against works Tridents, Japautos, Laverdas and host of other competitors. It took Peter Williams—or his first-string cohorts—to keep Nortons near the front and close to victory. The factory could only refine and modify, coaxing and cajoling more horsepower out of the twin in small snitches. Other factories, working with newer designs, could, by comparison, simply dial up more power as needed.

In Formula 750 Norton faced the same problems in the same way. From their beginning in 1972, the John Player bikes surrounded the ancient twin with innovative running gear. Horsepower could not be spent frivolously; that meant weight-conscious construction and wind-cheating streamlining. The machines had to handle, for the twin lacked horsepower to regain lost ground on straightaways.

The old engine, ten horsepower short in 1972, dropped fifteen horsepower short in 1973. Sometimes winners' circles would yield to sheer finesse, and perhaps 1973 was the best year for the John Player F750s. But in 1974 the deficit bulged to thirty hp. Cleverness has its limits.

On the street the Norton seemingly has no limits at all. Norton re-engineered the 750 into the 850. The pistons took one final stretch to 83mm which bumped the capacity to 828cc. A stronger lower end assembly turning on German "Superblend" roller bearings underpinned the increased displacement. The last 750s with "Combat" engines had run 10:1 pistons and so-called SS cams. The 850 returned to milder S cams for a long life under a 6500-rpm ceiling. The Norton twin entered its final era in softer tune, a kind of mature gentleness that befits the engine's age.

So beneath the white fiberglass of the 850 John Player Norton is a cut of history: bits and pieces of the 88 and 99 lie inside; the Manxman and 650 Sports Special remain there; traces of the Atlas and Production Racer still run through the 850. The Hopwood engine outlasted the men who first built it, survived the downfall of AMC, lived on in the Isolastic Commando, and raced head-to-head with modern Superbikes. That Norton engine is so confoundedly *England*—where one generation builds something new, the next two generations develop it, and the sun hangs long on a chilly December day. ©

