

Roaming Around the Countryside

The North Bucks Road Club
Newsletter June/July 2005



In this issue:
Cycle Touring in Scotland
Dieppe Raid

Audax Report
Science of Cycling: Armstrong
vs Indurain



North Bucks Road Club

www.northbucksroadclub.org.uk

Club Newsletter

Volume 2005 Issue 4, June-July

Dieppe Raid

The boys in France - a report
by Alan Lawson

Page 8

Billy Wagglethingie's whatsit

Audax report by Dave Atkinson

Page 9

Club TT League

Latest results, and the club
league standings, prepared
by Gilbert. Find out who's
won what, where, and when!

Page 15

Science of Cycling: Armstrong vs Indurain

Lindsay Edwards presents a
fantasy tour in which Lance
Armstrong is pitted against
Miguel Indurain...

Page 10

Cycle Touring in the Hebrides

Robert took off on a tour of
the Hebrides, with his trusty
stoker Carol. Good
weather? Good food? Read
on...

Page 3



It's a bit different to Buckinghamshire! A view of typical South Uist landscape.

Editorial

A bit of a large issue this time! I had expected summer issues to be bulging with race reports, but I have had no reports of road racing activities, and nothing on open time trials. We have an update on the club evening TT league, complete with an updated league table prepared by Gilbert, which is more accurate and comprehensive than my effort last time.

Apart from that, we have a touring article by me, and a technical article comparing Armstrong and Indurain by Lindsay. Remember, if you don't want this newsletter to turn into a Saunders vanity press magazine, send me in

some articles to include!

I have managed to keep reasonably on top of the club website. This seems able to attract new participants for the club league, which is good, and I hope many of these people will join the club.

Finally, an apology for the late arrival of the newsletter - initially due to my touring holiday, then to other unpredictable events - it is unfortunately about two weeks late. However, I am now collecting material for the next issue, which should be out at the end of August.

Chairman's Ramblings

With the season in full flow and good results coming in it may seem a little premature to turn our attention to the club dinner already. But this we have had to do to ensure our booking.

This year's dinner will be held at the Wavendon Golf Club in the upstairs dining area. The space will be all ours for the evening and I was thinking we may even have a small disco in the separate room. There will, of course, be a full bar and the food will comprise a

3 course carvery with vegetarian options. More details on that when we have had our next Committee Meeting and a meeting with the Events Manager at Wavendon. Cost will be under £15 a head - a more precise amount will be available shortly.

One of the agenda items at the next Committee Meeting will be the selection of a suitable guest speaker. Please let me know if you have any

ideas (preferably sensible ones) on who we might approach.

We hope to continue Phil's success with the Open 10 at our next major promotion, Ian Stokes' event on the Botolph Claydon circuit starting at 2 pm on 23 July. Although the course can be marshalled by a minimum number of people, it would be excellent if we can match the turnout achieved at Phil's event. Not only does this relieve pressure on the organiser - it makes NBRC look good. Please let Ian have all your offers of support and assistance.

Our evening events continue to grow in popularity with both club members and visitors taking part and riding personal best times on all our usual courses. Well done Tony Farmborough for your organising and results service.

I don't know if Gilbert realises how much he has bitten off in offering to organise the TT league tables. But I

know he has a strong constitution and will chew as much as possible before resorting to swallowing the rest whole. A large round of applause to Gilbert for volunteering for this job (albeit under just a little pressure).

That's about all I have to say in this issue. I look forward to seeing you at club events, either racing, spectating or helping, and possibly at the Bowl.

Bryan

June 2005

Robert and Carol's Hebridean Odyssey

Day 1: Tayport to Killin, 82.06 miles

The first day of our tour began sunny and bright, though a little cool at first. We left Tayport at about 8.30 am. Because this was the first day riding with full panniers, we decided on a brief detour for a bit of bike practice, which turned out to be a good idea. Unfortunately the roads were quite busy at times as rush hour approached. Rather than traverse Dundee's new traffic system, after crossing the Tay Bridge, we headed out along Riverside, and out through Invergowrie, Kingoodie and Longforgan, where we crossed the main A90 at the Longforgan underpass.

Carrying on into the Sidlaw Hills, we were rewarded with splendid views of distant mountains. Once over the Sidlaws, we carried on through roads made familiar through years of Dundee Wheelers club runs to Birnam, where we stopped at Katie's Tearoom, one of our old favourite club run tea stops. Lunch was soup and bacon and egg rolls. Katie remembered us from our many visits when we lived in Dundee!

Thus fortified, we turned onto the A9 briefly, before turning onto a B road for Aberfeldy via Grandtully. This section of the route was pretty uneventful, and was by and large a pleasant ride - the

sun was still shining, and it had warmed up considerably. The last four miles before Kenmore were pretty hard going, but a teastop (with serious carrot cake) there put us to rights, and energised us for the 17 miles along the north side of Loch Tay. There is a cycle route beside the loch, but it takes the minor road on the south side, which is severely undulating, and has a poor surface, so we avoided it. We reached Killin at about 4.30pm. After finding a B&B and getting cleaned up, we went out for a couple of beers and a reasonable seafood chowder.

Day 2: Killin to Oban, ferry to Lochboisdale, South Uist, 58.71 miles

We slept well, but got going early to ensure we wouldn't miss the ferry from Oban to Lochboisdale in South Uist. It was another gloriously sunny morning, and a little warmer than the day before. We made good progress along the main trunk road through Crianlarich and Tyndrum, but didn't stop until after the Cruachan Power Station (this is apparently an enormous hydroelectric power station carved inside a mountain - a bit like the base of one of those megalomaniac villains in a James Bond movie). At a cafe we packed in soup, egg and bacon rolls and apple pie, before pressing onwards. Although the roads were quite quiet, at one point as we rode alongside Loch Awe, a pair of

RAF jets came howling by at low level, very alarming, and not the only time this would happen during this holiday!

From here on, the traffic levels built up a bit, and the road undulated more severely, making it all rather heavy going into Oban. Still, we rolled through Oban to the ferry port with plenty of time to spare. We bought our tickets and had a stroll about. There was a fair amount of publicity for the BBC childrens' programme "Balamory", which is filmed in Tobermory on Mull, one of the islands not far from Oban.

The ferry departed at 3.30pm. Unusually, there were few birdwatchers on board - normally they afford considerable amusement as they chase from one side of the boat to the other, brandishing binoculars. This ferry crossing was the longest of our tour at over 5h. The quality of ferry catering is pretty basic, but while and it's basically fish and chips, I managed to have herring fried in oatmeal (albeit with chips!). The Tourist Information office open when the ferry arrives, and they efficiently found us a B&B about two miles down the road.

Lochboisdale is a curious and rather bleak place, consisting of a scattered collection of houses, the CalMac jetty, a few shops, a hotel, and not much else. As we cycled out of

Lochboisedale, the familiar settlement pattern of South Uist could be seen ahead - rather than discrete villages and settlements, the houses tend to be evenly distributed near the roads

Ferries in the Outer Hebrides are run by Caledonian Macbrayne, popularly known as CalMac. For many reasons, these services are subsidised, and represent good value, particularly for cyclists. We bought one of the Island Hopscotch tickets, which covers the four principal crossings for £35 each, with the bike carried free.

Day Three: Lochboisedale to Lochmaddy and Berneray, 61.81 miles

After a really good sleep, we woke to find the morning dry but overcast. After a hearty full fried breakfast, we set off northwards, with a gentle tail wind. Some miles up the road, we took a detour via Stonybridge, to walk on the famous silver sand beach. We were surprised to find large defences of boulders and shingle had been piled up between the sandy grass and fields and the beach, and it was a fair old scramble to get over them. Later on, we found out why these had been put in place. Still, we walked for a while on the beach, scaring some Eider ducks. It was a shame that it was such a gloomy day, but the sands were still a sight to see.

From South Uist, we rode on towards Benbecula, a landscape of small islands with lochs, all linked by causeways. As part of a recurring theme, we noticed that many of these had been damaged, with the embankments (which are made of pretty large boulders) showing sign of considerable damage. Benbecula is

a strange place, seemingly more water than land. There is a considerable variety of bird life, and you can see why the birdwatchers come here (and why there is a program of hedgehog eradication - they were introduced in the 1970s, and are steadily munching their way through the eggs of ground-nesting birds, which is most of them, since there are precious few trees on the Uists). Unfortunately, we don't have a wide knowledge of birds, but we did recognise Eider ducks and ducklings, Greylag geese and goslings and saw a fledgling cuckoo being fed by its tiny foster mother (actually we heard loads of cuckoos though our tour, but this was the only one we saw).

We stopped by one of the causeways and fired up the Trangia for lunch. After curry washed down with coffee, we set off again, unfortunately through a few brief flurries of drizzle. The wind got a little stronger, but fortunately remained a tailwind. Navigation on the Hebrides is rather easy, since there aren't many roads to choose from! We turned east at Clachan, and headed for Lochmaddy, over the peat bog moors of North Uist. North Uist isn't what you'd call mountainous, but it's significantly hillier than South Uist and Benbecula, though the cycling is still pretty easy. Lochmaddy is one of the CalMac ports, and ferries leave for Uig on Skye, and other destinations. We rolled in to Lochmaddy in search of a B&B, but none seemed to have vacancies. In fact there didn't seem to be very many B&Bs at all, and the one we'd used on a couple of previous visits was conspicuous by its absence (we later found out that it had burnt down!). We

resorted to the Tourist Information office, who were pretty useless. Next we tried the Lochmaddy Hotel, in desperation, since a double was £95 a night! They had no vacant rooms, but the receptionist was very helpful, and phoned around to find us a room in a B&B about 6 miles north, near the road to Berneray. The downside was that the landlady wouldn't be there until



6pm, and this was at about 3.30pm. We also heard about the tremendous storm of January this year. In fact there are still large diesel generators dotted around the Hebrides, as the power lines haven't been fully replaced. A family crossing one of the causeways was washed away and killed in this storm, in which winds of over 120mph were recorded for 5-6 hours (this is not gusts of 120mph...), and which explained the damaged causeways and the storm defences on the beaches.

We left the Lochmaddy Hotel and went to the Lochmaddy arts centre to look at the exhibitions and eat a snack. Then we set off to investigate the Berneray causeway, which had opened since we were last on the Uists. The ferry to Harris now leaves from Berneray rather than North Uist. By the time we'd trundled there and back, we arrived at the B&B around 6pm. It turned out to be very comfortable, as is usually the case. We were getting a little worried by the difficulty we were having in finding B&Bs in the Hebrides - perhaps this was because we were travelling a few weeks later in the season than usual. We resolved to go back to the Lochmaddy Tourist Information office the next morning to arrange accommodation in Tarbert before we set out for the ferry. And so to bed...

The trusty stoker, the tandem and the new sea defences!



Day Four: Lochmaddy/Berneray to Scalpay, 45.55 miles

We were a little worried about finding accommodation in Tarbert, given the difficulty we'd had in Lochmaddy. So we decided that after breakfast (another full fry-up!) we'd head into Lochmaddy to see if the Tourist Information office could arrange something for us. I was a bit doubtful given our experiences of the day before, but was persuaded. The B&B lady kindly phoned the office to check that they could do this, and to get he ball rolling before we turned up. These arrangements cannot be done solely on the phone, since a payment of 10% (deducted from the B&B) plus a £3 booking fee has to be made.

Off we went, to cover the 5 miles or so to Lochmaddy. About 3 miles in there was a huge bang from the rear tyre. Closer examination revealed a split about a centimetre long just above the bead. This is a problem tandems suffer from, particularly when heavily loaded. It's irritating, though, and necessitated removing all the rear luggage, disconnecting the drum brake, then removing the wheel before replacing the tyre and tube. Having done this, we were faced with the issue of inflation. Our trusty Zefal HPX pump had been pinched in Tayport and replaced by a Blackburn minipump in Killin. Quite frankly, the advertising blurb associated with the typical minipump are barefaced lies! I would dearly love to meet the man who can get any tyre up to the claimed 160psi with one of those things, let alone a 32mm touring tyre to 90-100psi! Anyway, I did the best I could before carrying on to Lochmaddy.

We reached the Tourist Information office and arranged a B&B on Scalpay, a small island off Harris, just east of Tarbert. This took a while, and we were glad to be on our way again to Berneray to catch the ferry to Leverburgh on the south of Harris.

By this time, a stiff breeze had sprung up, and we battled against this to come trundling along the Berneray causeway with about 25 minutes to spare. Since our last visit, when the ferry was a poxy old affair with a small seating lounge smelling faintly of warm vomit, they've upgraded to spanking new ferry with a really nice seating lounge, and nice, clean toilets. The ferry takes just under an hour to cover the very short distance to Leverburgh, since the intervening stretch is liberally populated with small islets and submerged rocks – accordingly, the ferry keeps turning to avoid them. The trip was enlivened by a group of kids who appeared to be in a Scottish folk band – whenever three or more of them

were within a few feet of each other they would break into song (the kind of song you hear on BBC Scotland Hogmanay programmes).

We rolled off the ferry at Leverburgh and made straight for the tearoom/shop, where we first had tea and carrot cake, then shopped for some fruit and things for lunch. Soon after leaving Leverburgh, the road became singletrack again, which slowed us right down, because many cars just won't wait in passing places. Still, the sun came out for us to admire the wonderful golden sands of the Harris beaches. We stopped above one of

unfortunately, I was rather thirsty). Oddly, down in the bay in front of our B&B was a moored or partially sunk concrete ship, being used as a jetty by the fishermen. Our B&B landlady obviously hated it, and said it was a German ship dating from WW2.

Day Five: Scalpay to Scalpay: cycling in Harris, 31.84 miles

We had planned today as an easy day, and while we only covered a little over 31 miles, the roads were far from easy! Our plan was to cycle in to Tarbert (not that there was a great deal of choice in the matter!), then out along a B road to

The Cuillins looming towards us as we cycle through Skye



these to have lunch (see the cover picture), much to the amusement of a seal, which bobbed about in the sea gawping at us. Further on, the road turns inland and starts rising. It takes you up over the rocky interior of the island – very rugged landscape. The last time we cycled this way, it was torrential rain, and we eventually squelched into a now-closed B&B in Tarbert. This time however, it was hot and sunny, and while this made the climbing seem that much easier, it was also quite hot work! The scenery at the top, where the road undulates along was stunning. After a while, the road descends quite steeply into Tarbert, which lies on a narrow isthmus between North and South Harris. We found a tearoom five minutes before it closed (fortunately). Then off along 5 or 6 miles of severely undulating road to reach Scalpay. The Scalpay causeway is actually quite an elevated bridge, and quite fun to cycle over: the B&B was very close. After unloading all our gear and showering, we wandered out for a short evening stroll. There are quite a few houses, a school, no pub (that we could see at least -

the West of Harris, which eventually reaches a place called Huishinish. We realised this might not be a terribly flat road, but were actually quite surprised at how hard it was: it went up in short steps of extremely steep gradient. We stopped to eat a small lunch and admire the view after a bit, but it was a bit cold as the wind had swung round during the night to come in from the north. After 16 miles of slogging up and down, we decided this wasn't the best way to spend a "rest day", and turned back towards Tarbert, where we stopped for some excellent beer (Hebridean breweries' Seaforth Ale), at a newsagent for a paper and at the tearoom for some food. Then back to the B&B in Scalpay. The evening was a gloriously sunny.

Day Six: Scalpay to Tarbert, ferry to Uig (Skye), then to Carbost via Portree, 43.31 miles

Today we were to travel over to Skye where Will and Cath, the friends we had stayed with in Tayport prior to setting out, had rented a cottage for a week of mountaineering. We woke to clear blue skies, and the water in the bay was like a mirror. After breakfast

(when we had an interesting conversation with another guest who'd retired to Lewis from Kent), we loaded up the tandem and set off for Tarbert. Unfortunately, the skies had clouded over by the time we reached the ferry terminal. We checked in and hung around until they'd loaded the cars on the ferry, and we could get on. There were several cyclists on the ferry this time, in contrast to the others. The trip was really very calm, and we could see good views of Harris as it receded, and of Skye as it came closer.

The crossing only takes about two hours, but we had to wait for the cars to disembark before we came rolling down the gangplank. The jetty is quite long, and it's just as well we weren't chased along by cars! We had decided to start by going to Portree to find a rumoured bike shop for some inner tubes. On the way, we saw loads of signs counting down the miles for a triathlon, but we didn't see any competitors. We went to a cafe for some lunch, and got talking to a guy who'd come over from Harris to run a half marathon – they'd borrowed the road signs from the triathlon club, apparently! From Portree we took the road over the moor towards our destination, Carbost. This is quite a steep road at times, but we didn't have too much trouble, and in any case the route was really quite picturesque. It was still rather cold, despite having what appeared to be our own private sunny patch following us along. Near Struan, the road joins the main A road, alongside Loch Harport. This was also quite hilly, but we were rewarded with excellent views of the cloud-capped Cuillins.

The final leg to Carbost was a B road running back up the other side of the loch. We reached Carbost about 15 minutes after Will and Cath had rolled up in their car! After unpacking the tandem we spent a bit of time chatting about our holiday so far, and Will and Cath's plans for their week of climbing. A bit later on we went to the pub down the road for a couple of beers and some excellent seafood. I had oysters and then langoustines, all excellent.

Day Seven: Rest day in Carbost

After six days in the saddle, this was a very welcome rest day! It was also something of a relief not to have a full fried breakfast as our digestive systems were beginning to rebel against such cruel and unusual punishment. It was very windy, but mostly sunny. We spent the morning driving about the area, visiting art galleries and beaches, mostly in the shadow of the Cuillins, which look absolutely forbidding from

below. In fact, from the cyclist's point of view they look not only unassailable, but positively dangerous! We went to the Sligachan Hotel, which is pretty much at the foot of the Cuillins, for lunch (Cullen Skink).

In the evening, we drove down to Broadford for dinner at the excellent Creelers restaurant (smoked venison, king scallops, chocolate mousse).

Day Eight: Carbost to Armadale, ferry to Mallaig 41.81 miles

I woke at about 6am, but it wasn't until 6.40am that I plucked up the courage to look out of the window. The weather forecast had predicted wall to wall rain. I gritted my teeth and opened the curtains...grey, gloomy, drizzle. Oh well, I thought, could be worse! At least the wind had dropped.

By 7.10am, the rain had got much heavier, and the weather forecast was for several days of rain... Despite this we set off from Carbost at about 9.40am, by which time the rain had eased back to drizzle. In complete contrast to the day before, when the Cuillins were bathed in glorious sunshine, today the clouds were so low that the mountains were well-nigh invisible. Once on the main south road, we made good progress, with a helpful tailwind. We had originally planned to take an old coast road, but we'd checked it out in the car on the way back from dinner in Broadford the night before and found it to be in an extremely bad state of repair, so we stuck to the main road. Will and Cath had decided against climbing in the rain, and they came bowling past us with a cheery toot in the car on the way to Broadford, while we were trundling up a hill. From here it was a rapid ride into Broadford, where we stopped for some food, and to buy some snack bars in the shop.

After this early lunch, we pressed on through Broadford, declined to squelch into the Sepentarium (a reptile centre) in favour of the Armadale road, and carried along the new road, which turned out to be rather quick. During the afternoon, the weather started improving, and by the time we reached Armadale, before 2pm, it was actually quite sunny. We decided to catch the next ferry at 2.25pm. While Carol perused the delights of a knitwear shop, I took it easy in the small ferry terminal, listening to a bunch of loud German tourists, who turned out to be rather bravely driving open top sports cars to some kind of rally. It's a quick crossing to Mallaig, about 30 minutes, and we rolled off in search of a B&B, in brilliant sunshine. We found a B&B right near the harbour, and got the kit

off the bike. We got cleaned up and nipped out to find something for dinner. This of course involved the consumption of beer! Dinner was more seafood – I had a seafood platter, which is always subject to what's been dredged up by the fishermen – it wasn't bad, but not the most exciting example I've had. While Mallaig was a bit bigger than I remembered it, there's not much there apart from the harbour and a rail station. Even the tourist information office closes at an inappropriate time of day.

Day 9: Mallaig to Strontian 49.54 miles

We woke to a perfect sunny morning. So good in fact that it was hard to believe all the weather forecasts predicting heavy rain. Carol managed again to avoid a full fried breakfast, and had some really unctuous local kippers. I succumbed once again to the fry-up temptation. Thus fortified, we set off down the road.

The Mallaig road has been "improved" so that it is straighter so motorists need less skill to avoid careering off the tarmac. It was nice and wide and smooth and nearly deserted. This didn't stop one fat git in a 4x4 hooting, shouting and gesticulating that we should be on the cycle path (a cycle path that is wholly unsuitable for tandems, touring bikes, or indeed anyone using bikes to travel more than a few hundred yards). This was one of the few nasty encounters with motorists (see Day 10 for the other one) and it left a bad feeling. At Lochailort, we turned off towards Moidart, one of our favourite parts of the west of Scotland. This was where we had our first experience of cycle camping, on a weekend trip with some friends, and we've always had a soft spot for it.

We rolled along the shores of Loch Ailort, admiring the views, which were quite stunning in the brilliant sunshine – in fact, we could see the mountains of Skye quite clearly, and hoped Will and Cath were getting some climbing done! The road undulated along the loch, past low woodland on the left with a lot of bright pink flowering rhododendron growing, and fish farms in the loch to the right. Eventually, the road reared up for a stiff climb and fast descent to Loch Moidart. We stopped at this point to heat up some chili for lunch and quaff some tea and coffee. This was a little early for lunch, but it was a nice warm, spot, and we wanted a break before the weather closed in (there were clouds on the horizon...). We set off again after lunch and soon crossed River Moidart where we'd camped on our first visit years ago. A real midgie-trap if ever there was one! Another climb took us over to Loch Shiel, where

the rain started as drizzle, a climb over to Loch Sunart led us to Salen, where there's a turn to a road which leads down to Arndamurchan, a really beautiful peninsula, but unfortunately we didn't have time to visit it. Instead we carried on in rain that became more persistent, or roads that were increasingly switchbacky, finally arriving at Strontian about 3pm. There didn't appear to be any B&B vacancies, so we stopped at the Tourist Information office for help. What is it with Tourist Information offices? They always seem to have staff called Morag with the intellectual capacity of a peanut. This one was useless, and nearly got a good shouting at. In the end we popped into the Strontian Hotel (we got the last room), which turned out to be a lovely 2* hotel with a bar that had a massive window overlooking Loch Sunart. By this time the rain was hammering down, and we spent a very pleasant few hours eating and drinking while admiring the view (and wondering just why that bloke was wandering aimlessly around bay the loch side in the siling rain – we never did figure that out!). Later in the evening Carol entertained herself by slaughtering midgies that had got into the room!

As an afterthought, I was reading Boswell and Johnson's 18th Century account of their tour of the Hebrides while on this cycle tour – I bet they never had to deal with stupidities like Tourist Information office.

Day 10: Strontian to Killin 72.83 miles

7.00am. This might be the wettest day of the tour so far – the forecast looks absolutely diabolical. We were woken at about 3am by an astonishingly torrential downpour coupled with gale force winds. However, by 7am it was dry and sunny. And not very windy.

5.10pm This is written in a cosy B&B in Killin after a very arduous day's cycling. We set off from Strontian in bright conditions, but it soon clouded over. The first stage was to get over to Corran where there is a ferry across the sea loch, and then cycle onwards to reach Killin for the night. We got to the Corran ferry in plenty of time, but as we waited for it, we got our first (and only) midgie attack. Oh, and the rain started. On the bright side, pedestrians and cyclists travel free on this ferry. Once across, we paused to sort out the map and get overshoes etc on, before cycling onwards. Our aim was to go via Glencoe and Crianlarich. So off we went in increasingly wet conditions, down the A82 trunk road through Ballachulish and past Glencoe village. By this stage we were pretty wet, and (stupidly) decided not to stop

for a bite. We carried on, as the road climbed up an up and up and up through Glencoe. Fortunately the gradient isn't too severe, and neither was the amount of traffic. Despite (or even because of) the rain, Glencoe looked stunning, with massive mountain rearing up on either side, with their peaks lost in mist rain and cloud. Unfortunately, near the top there was a set of roadworks, complete with a sign saying pedestrians and cyclists should use an alternative route (like we were willing to turn round and go back...I think not). So we carried on, and made it to the top, despite a lorry's attempts to drive us off the edge of the road with impatience.

At this point I had high hopes of a decent descent, but we were thwarted by Rannoch moor, which just seemed to go on and on, gently undulating, with teeming rain. It was too wet to stop to make a cup of tea or lunch, so we struggled on, barely fortified by our remaining snack bars. We got slower and slower as the energy ran out. The road seemed never-ending. The last few miles before Tyndrum were pretty ghastly, but we zoomed off the moor and into Tyndrum after about 54 miles of cycling, most of it wet. After a brief "animated discussion" about which grotty cafe to go to, we chose a self-service establishment, where we finally ate after a buch of extemely slow Spanish families made their orders. Thus replenished, we carried on through the rain (which was easing off a little) via Crianlarich to Killin. The post-prandial miles seemed to go by very quickly. We chose the first B&B we saw in Killin, and they could not have been more friendly, despite our general dampness. (In fact they put a boot-dryer in our room so we could dry out our shoes). After getting cleaned up, we popped out to look around. The B&B was right by the Falls of Dochart, where the Loch Tay's incoming water arrives. I don't know how big the catchment area is, but there was one heck of a lot of water tumbling along the falls that evening, after all the rain of the previous day or two. We popped into the pub near the falls – last time we visited, this had been a rather basic, old-fashioned pub. This time it had metamorphosed into a rather splendid B&B cum bistro cum restaurant cum pub. The food was excellent (as was the beer – I had a couple of pints of Ossian Ale). I ate risotto cake with goat's cheese followed by a trio of Scottish cheeses, while Carol has salmon followed by some sort of creamy whisky custard confection for dessert. Finally, back to the B&B to conk out, but not before discovering that the forecast for the next day was

pretty damned good.

Day 11: Killin to Tayport 70.98 miles

And so we reached the final day of our tour. At breakfast the next morning we met couple who were on a hill-walking trip and another cyclist, who was planning to ride to Crianlarich to meet up with a friend, catch the train to Rannoch Station, then cycle back to Killin, presumably via Schiehallion. At this stage the weather was at least dry, but by the time we set out, the inevitable rain had begun. For some time we managed to stay at the leading edge of the rain, but eventually it got pretty heavy. We set out at about 9am, beginning by climbing over Glen Ogle, which takes you over to Lochearnhead, on Loch Earn. It's actually quite an easy ride heading south, as we did, heading north would be a bit more of a challenge. There's a Sustrans route off to one side of the road – it seems to follow an old railway line, and appears to career off away from Lochearnhead. We never did see where it led to...

From Lochearnhead, we carried on along the north side of Loch Earn, which is quite a pretty road, and a nice level road. Pretty uneventful, except the full magnitude of the BBC's weather forecast lies became clear at this point! We quickly reached St Fillan's (the village at the other end of Loch Earn and carried on to Comrie, where we stopped for tea and scones. Then we stayed on the A85 trunk road (which wasn't really too bust until Crieff, where we turned off towards Auchterarder. Here the landscape is beautifully rural – green fields, lots of livestock, but with some hills in the distance. This is near Gleneagles where the G8 summit together with attendant protests was due to take place. Near Auchterarder, we passed under the A(one of the busiest roads in Scotland, and then through more undulating agricultural scenery, through a succession of delightful villages, until we were in sight of Perth, and our old cycling grounds from our Dundee days.

We cycled along the south side of the River Tay, stopping for a sizable lunch at our favourite café by the round tower at Abernethy (round towers are buildings of unknown purpose, quite common in Scotland and Ireland – maybe defensive, but they do look a little frail for that), then carried on. We were cycling through Wormit, where the Tay rail bridge crosses the Tay, when disaster struck – the replacement rear tyre started to give way. After only 350 miles or so! We debated what to do – we were only 5 miles from Tayport, where we'd left the car, so Carol phoned for a taxi and went to get

the car, while I took refuge in a bus shelter, bodged a partial repair to the tyre, and realised how fortunate we had been that it hadn't happened while crossing Rannoch Moor! Eventually, Carol returned with the car, we loaded up and we set off south to Edinburgh, our cycling trip complete, albeit on a somewhat unfortunate note.

Manchester Velodrome

Last year, Warren & I, plus Kevin and Mark attended Revolution 7, and it was fantastic. Equally good, the next day we rode in the club training session on the very same boards, all as arranged by the A5 Rangers.

I have reserved a place again for the North Bucks Road Club on Sunday 16th October 2005, which follows Revolution 9 the night before. Due to the fact that the World Class Performance Plan riders have a session booked in the morning, we will have a 2 hour session from 3PM until 5PM, so a leisurely morning prior, you can probably watch these guys training!

Book your place now if you're interested - just think, all those British World and Olympic track riders racing on Saturday, you on the same boards the next day.

Don't know cost yet, but it will probably be between £10 & £15 each including track bike hire - transport to be arranged by yourself.

First come first served, maximum 20 people.

Bike for Sale

Look KX Light 53cm (top tube) full carbon frame, Look HSC 4 full carbon forks, Selcof carbon seat pillar NEW 10 speed ULTEGRA, New R550 wheels, NEW Fizik saddle, New bar tape New Tyres, New cassette. Has 3 minor paint chips on top tube, otherwise flawless. Can arrange pictures if needed. (If you're a campag fan CHORUS OR CENTAUR with Used Vento Wheels can be sourced) Ultegra £1450ono Chorus £1650ono Centaur £1450ono Call Heath Jackson on 07841 405 510.

Tips from the Toolbox

Ever wondered how Lance Armstrong and the other pros record such high speeds during races? The answer does not lie in scientific analyses, as shown by Lindsay this issue. *Tips from the Toolbox* can exclusively reveal that the explanation lies in careful wheel-balancing.

Most of you will have noticed that when you spin a bike wheel, it usually jumps a bit. This is caused by an off-centre weight, usually the computer magnet. By balancing your wheel with a second magnet you can make your wheel rotate that bit more smoothly. In fact the effect on your speed can be quite dramatic, even to the extent of doubling the speed you normally achieve.

Marshals Required

Ian Stokes is organising one of the few open time trials the club still runs on a regular basis. The event is a 22 mile time trial run on F5/11, the Claydons circuit. This event is important, as it often forms part of the national Rudy Project series, consequently it is essential this event runs smoothly.

Please try and make time to help with the marshalling and other HQ duties for this event. Make this year's edition another one that the club can be proud of!

Contact Ian Stokes to offer your services. Tel. 01234 240140, email ian.m.stokes@btinternet.com

Ian is organising a Rudy Project event on this course in September 2006.

Dieppe Raid

Report by Alan Lawson

Obviously the hilly & arduous course of the previous year must have faded from our memories, because a previous Wednesday found Swiss Tony & myself putting the final details to the plans for another Raid Dieppe. So with great excitement the team of Swiss Tony, Colnago Tony, Gavin Soden, Police Andy, Dave Atkins, Brian Premitt, Steve, Russell, Dick & Chris Selley was hastily assembled, with a couple of substitutes, notably Big Symon & Les not having the correct stamp on their pass-outs.

Despite my advice to Tony on the previous year the main group still decided to lodge at the (Barbara) Windsor hotel, with Gavin, Brian, Andy & myself opting for the Ibis or Abyss as it was to be called. Not being one for an early Morning the four of us, opted to stay in Brighton on the Friday evening at Brains brothers. The evening at Brighton was quite interesting, made even more so, by the girl who wore the belt instead of a skirt in the pub & the guys who seemed a little disappointed that Police Andy wasn't in uniform.

Saturday morning (6.30am) found us at the port of Newhaven, meeting up with Chris & Dick, we had news of Swiss & the boys via mobile phone, of them

still being in Brighton, perhaps Tony was still dancing on top of the podium from the night before. We eventually managed to get sorted out for the 8am sailing, however the Italian owned French ferry, couldn't actually work out what a bicycle was, so we all hung around for another hour until they let us on. Now I'm not going to say that the boat was a little passed its best, but the back end vibrated so badly that a large number of ladies were sitting in the stern lounge wearing the laminate off of the corner of the tables. We eventually made our way to the respective hotels & agreed to meet up for a training ride a few hours later.

We found the Ibis most welcoming to cyclist's with the offer of the heated conference room to store the bikes or the option of putting them in our rooms, I understand that the facilities at the (Barbara) Windsor was not as accommodating, with a large amount of bikes sharing a small open courtyard, with beer crates etc. This proved quite a novelty for Andy, who's bike is not allowed to cross the threshold at his own stately pile, so photos were taken to educate the bread knife.

The Saturday ride out along the sweeping coastal roads, was a joy for all, except the in the beginning, when no-one was exactly sure where we were going (just like the Sunday club rides). We finished up after a short-ish 10 mile jaunt at a rather pleasant

Continued p9

Audax report - Billy Waggle Dagger's Big One.

By Dave Atkinson

Apparently this is a play on words for William Shakespeare, though I don't know about the "big one" - perhaps Anne Hathaway knew more!

For those of you who don't know about audax, a brief introduction or rough guide. The event is usually entered at least 14 days beforehand, and a route sheet is sent out in time for riders to study it once perhaps follow it on a map. On the day of the event, each rider is issued with a brevet card with their name on it. This has to be stamped at predetermined points along the route and in addition, questions may have to be answered (such as how far does a signpost say to a certain town, or the name of a church).

And so the day dawned. I know that because we were there as it dawned! 201 km of rolling Northamptonshire and the Cotswolds lay ahead - we actually touched four Counties, Oxfordshire, Gloucestershire and Warwickshire, narrowly missing Buckinghamshire. So there we were, 5 NBRC men - Les White, Tony Farmborough, Russ Page, Tony Brunton and myself. If you cast your mind back to early May, you may remember how cold the wind was at that time. We started at eight and wouldn't finish until late, so I had taken it upon myself to provide willy warmers for the team, kindly provided by my wife Chris.

So then we were off, the front riders

setting a cracking pace, one we couldn't stay with all day (remember, it's not a race). So gradually all the riders are scattered all around the route. The first control was at Towcester, after 57km. At this control, we had to provide a till slip from the shop at the service station as proof we had been there.

The next leg was to Wellesbourne airfield which is 6km from Stratford on Avon, after another 53km into a stiff cold wind. We shared out the work at the front, but I found it very wearing with very little of it on the flat but I was looking forward to lunch at a garden centre at Charlcote. we had been there before, and they not only do good food, but plenty of it! We paid with our order, only to find it would be at least 30 minutes before we got it. We had planned a 30 minute stop, but because of this we didn't leave for over an hour. When we did come out, it was pissing down, so we waited for the worst to pass before setting off to the next control to get our cards stamped and then on to Stratford on Avon. Stratford was very busy as I expect it always is, while there, we had to answer questions for the brevet card: what was the date on a chimney on Anne Hathaway's cottage?, and how many front doors were there on Mary Arden's cottage? Apparently Mary Arden was Shakespeare's mother, something I learnt there!

The next control was at Evesham and we were starting to get a few climbs - nothing serious yet. By Evesham, the weather had brightened up a bit by now and it wasn't as cold. The control was down the narrowest of lanes to a restaurant called Raphael's which nil by the river Avon and a small ferry pulled by a rope - a spot not to be found by the casual observer. We knew the next leg would be hard so we had a decent stop, got the cards stamped and away again. 148 km done.

Leaving Evesham behind, through Weston-sub-Edge, Ashton-sub-Edge, with the Cotswold escarpment

looming in front of us, we had to cross it to get to Chipping Camden - and it was every bit as hard as I had imagined. Just getting the pedals over, we all made it down to Chipping Camden, looking for a left turn to Paxford, which we all missed. Through Chipping and we climbed Dovers Hill - imagine the steepest part of Bow Brickhill for about a mile. I didn't think you could go at 2mph without falling off! Just to add to the agony, and after much deliberation, we found that we were off route and had to go back down the hill again! We did eventually find the turning that we needed for Paxford, so picked up the route again.

We were now encountering a series of short sharp climbs which were very draining. We had to find the distance on a signpost, but somehow we missed it, but no way were we going to retrace our wheelprints. Then through Churchill, a village (one of many) with a VE celebration. The hills kept coming and I was extremely tired and finding it difficult to concentrate on the route sheet - we had already found out the hard way how costly this could be in terms of energy.

At last, a sign for Charlbury, 1 1/2 miles, pure relief!. Back at the Scout hut they even had the lights on. It may be that I have been more tired than this, but I cannot remember when.

In all, we covered 135.44 miles in 9h 27 minutes, for an average of 14.64 mph.

As we were about to leave, Tony Farmborough said he knew a good way home, so he took the lead in his car. A lovely tour of the Glyme valley followed - we saw owls and bats - quite a surprise. We were seeing signs for Evesham and Stow-on-the-Wold, and we were expecting signs for Bicester. Tony's sanity and parentage were definitely being questioned. Eventually, we did a big loop and got on our way home!

beach-side cafe, where our delightful waitress knew just the one word of English (Hi).

This turned into a small problem, as Dave never did find the egg in his egg & chips (a typical French delicacy) & as for the banana crepes, who knows where they went. At the close of this little escapade it became apparent that I had been nominated the NBRC treasurer for the weekend, obviously my experience with BCCI, Bearings Bank & the Maxwell Pension Fund, was the deciding factor for this choice. With our 6 euro a head tariff paid, we

were soon suited & booted on our way back, up the large hill by the golf course, with only the fantastic view to take our minds off the pain in our legs.

With nothing booked & Dieppe crammed full of people, the evening found us, in the sea food restaurant that we had enjoyed the previous year, as it was the only place that was willing to accept the motley crew of eleven at short (or no as the case was) notice. Many tales old & new were relayed, which finished in myself insulting (unintentionally of course) the entire catholic community of France. With an

early start & 140km firmly in our minds we agreed to meet up at the hill at 8am for an 8.30am start.

8.20am saw the Ibis boys arriving ten minutes early & signing on, Andy tried to change the name on the entry form form Symons, only to be told that for the day he would have to ride as Dr Symon Cotton, now if I'd have known that PhD's were that easy to come by I'd have taken steps years ago. After hanging around for a while the lads from the Barbara Windsor arrived

Continued p14

The Science of Cycling: Armstrong vs Indurain

by Lindsay Edwards

Introduction

Every sports fan dreams of pitting the giants of a different era against each other. What would happen if Roger Federer and Bjorn Borg locked-horns? How about Stirling Moss in one of the 600 kg, 900 bhp Formula One cars of 2005? Intriguing, isn't it? How about Armstrong vs. Indurain?

There are many factors that go into creating a champion: determination, hard work, self-sacrifice and occasionally a little luck to name just a few. All of these things comprise a great cyclist, and yet cycling has a few unique qualities which set it apart from other sports and make it especially intriguing, not just to those of us who are fans, but to scientists too. It may seem as if competitive cycling is a war of man against man (or woman against woman) but there is another fight underlying every cycling performance, even a simple Sunday club run. Every time a human being rides a bicycle the result can be described in terms of a fight between the energy supplied by a rider and the forces trying to stop them. Over the years mathematicians, physicists and exercise scientists have tried to build a working model of the war between these opposing factions and to be honest they've got pretty good at it⁴. It's now quite easy to predict performance with some accuracy so long as you have the figures to put into the models, although the old computing adage of GIGO (or 'Garbage-In-Garbage-Out') still applies. There's even a website dedicated to just this job, Tom Compton's excellent 'www.analyticcycling.com'. Adding to all this has been the advent of the SRM power crank. The SRM (and subsequent devices such as the Powertap hub) allow the precise measurement of one side of the war I have just described; put simply, they allow riders, coaches and scientists to accurately measure the energy a cyclist puts into their bicycle. Finally, collaborations between scientists and cyclists have produced an increasing body of data which is available to just about anyone, so long as you know where to look. Of particular interest are three scientific papers released over the last five years: one chronicles Miguel Indurain's assault on the world hour

record⁵. Another is a very recent publication which reports the physiological and anthropometric measurements of Lance Armstrong taken over an 8-year period, from 1992 – 1999¹. The third is a paper by Dr. Daniel Heil, recently published in the European Journal of Applied Physiology². Hopefully this is all starting to make some sense. If we take numbers from the scientific papers I mentioned above and plug them into a model like 'Analytic Cycling' we should, in theory, be able to pit two of the greatest cyclists of all time against each other and see who comes out on top.

In the paragraphs which follow I'm going to be using the word 'assumption' a great deal, so it's worth bearing in mind that what we are about to do is a long way from being a scientific endeavour. This is the way it should be though; to paraphrase a friend of mine, if cycling was only a game of numbers 'they wouldn't have to bother holding the races'. The first thing we need to do is create a 'virtual' Tour route, and here's where the assumptions start. Our Tour will be decided in the mountains and the time trials only. Now I know that this is typically the case anyway, but it means that we will be making some other assumptions too. There will be no team time trial and both teams will be equally strong. Illness, psychology and luck will not influence the result. It will be man against man; we will even give them the same machinery. Both teams will be strong enough that neither man can escape at any time other than the final climb. There will be three individual time trials: a short 'prologue' time trial and two longer ITT stages, one before the mountains and one after. Prologue time trials have been typically less than 10 km in length but ours will be a little longer for reasons I will explain later. In 2000 the Futuroscope prologue was 16.5 km in length, so we will make our prologue 16.1 km (or exactly 10 miles). The two remaining time trials will be 60 km each, but with one of them completely flat and the other containing a moderate climb. There will be five mountain-top finishes with the Alps coming first: the Col de Galibier, L'Alpe d'Huez and finally the mighty Mont Ventoux. There will be two high-mountain finishes in the Pyrenees: Luz Ardiden and the mythical Tourmalet.

The Prologue.

It's the opening day of our virtual Tour and expectation is running high. The reason that our prologue is a little longer than normal is actually physiological. We have data indicating both Armstrong and Indurain's power outputs over longer time periods, but we have no data regarding their performance over shorter ones (such as the 10 minutes or so typical of a Tour prologue). Unfortunately the shorter the distance is, the more difficult it becomes to accurately predict performance based on performance in longer events. Rather than just guess, it's probably better to extend the length of our virtual prologue, particularly as there is a precedent from 2000. If you remember we mentioned earlier that cycling performance can always be expressed in terms of a war between the energy put into the system by the cyclist and the forces trying to slow them down (or stop them). In a flat time trial the vast majority of the forces that a rider needs to overcome are aerodynamic. Of the many factors which affect aerodynamic drag, two are down to the rider: their frontal area (A) and their coefficient of drag (C_d). These two figures are often distilled into one: C_dA or coefficient of drag area, expressed in m^2 (as C_d is essentially 'unit-less'). Therefore in order to predict performance in a flat time trial we primarily need two pieces of information: a rider's power output and their C_dA . Although many other factors such as wind speed and air density will affect the actual outcome, we are going to assume that two giants such as these will be scheduled to ride one after the other and environmental conditions are going to be the same. On 2nd September 1994 Miguel Indurain set a new world hour record of 53.040 km. Fortunately for us the attempt was chronicled by a number of scientists and the results were later published in the Journal of Applied Physiology³. Indurain had recently won the Tour de France by over five minutes from Piotr Ugrumov, so we can consider him to have been at the peak of his powers. 1 hour but also his C_dA . Indurain's power at OBLA ('onset of blood lactate accumulation'), which is an excellent measure of an athlete's sustainable power output, was recorded in the laboratory at an unbelievable 505 W! During his subsequent Hour record his power was calculated as being 510 W which is entirely consistent with his

lab-measured power considering the additional motivation of a record attempt and the fact that most athletes can ride a little above their OBLA for around an hour. In the same article Indurain's C_dA is reported as having been 0.24 m^2 .

My original plan was to also use data taken from Dr. Edward Coyle's article (also in JAP) reporting lab measurements made of Lance Armstrong from 1992 - 1999. However this paper presents us with some very real problems. Firstly there are no data whatever regarding Armstrong's C_dA . Secondly, although the information presented makes fascinating reading there is an obvious lack of data collected during a race season, at least after Armstrong started to win the Tour. The nearest measurements we have to an actual Tour win were taken in November 1999, some 4 months after his first extraordinary victory. It seems we will have to look elsewhere for our numbers and this is where Dr. Dan Heil comes to the rescue. In his article (examining the effect of body size on the world hour record²) Dr. Heil reports that Armstrong's power output for an hour record attempt would be close to 500 W, an incredible figure for someone of Armstrong's size and build. This is still an anecdotal number, but unfortunately it's the best we can do. We will test our predictions along the way against known results; hopefully this might add a little more credence to the numbers we generate. Unfortunately we have even less data regarding Armstrong's C_dA . It has been estimated to be in the region of 0.26 m^2 ; as we have no more information than this we will simply give both riders the same C_dA (0.26 m^2), meaning that the time trials will basically become a battle of power. Now that we appear to have what we need to get started let's plug the numbers into 'Analytic Cycling' and see what we get.

Firstly we're going to add a few Watts to both riders' 'hour power' as this is a short race. Most riders can generate around 5% more power over 20 minutes than they can over an hour. For Lance that gives a power output of 525W. If we enter that into 'Analytic Cycling' along with a C_dA of 0.26 m^2 we get an average speed of $51.876 \text{ km}\cdot\text{h}^{-1}$, giving us a time over our 16.1 km course of $18''37.28$. Let's see what happens when we make the course a little longer (16.5 km) and compare Armstrong's modelled time with the one he recorded in 2000 at Futuroscope. Our model gave us an average speed of $51.876 \text{ km}\cdot\text{h}^{-1}$ which in turn gives a time of $19''05$ over 16.5 km. Armstrong's actual

time..... $19''05$! So we're in pretty good shape, considering the amount of assumptions we've had to make. We'll try and make another of these little 'checks' a bit later. The other reason I made it 16.1 km was because that is exactly 10 miles (just curious to see what these guys would do in a '10')! Now Indurain: the same C_dA (0.26 m^2) but this time we use 510 W plus another 5% giving us 536 W. Stick that into Analytic Cycling and we get an average speed of $52.2 \text{ km}\cdot\text{h}^{-1}$, and a time of $18''30.34$. So it's close, but first blood goes to 'Big Mig'.

Results- Prologue TT (16.1 km)

1. Miguel Indurain (SPA) $18''30.34$
2. Lance Armstrong (USA) @ 6.97 seconds

The First Week

So Indurain carries a slight advantage into the first week. Now it's the turn of the sprinters and our two giants can rest in the pack, protected by their (equally strong) teams. Breaks go out and come back, lots of crashes happen but in this race, luck doesn't enter into it. However the first long ITT looms large on the horizon and Lance knows that he's probably in for a beating. It's a 60 km, pan-flat time trial and it's sure to be decisive. We already know that Indurain has the edge in a time trial like this, but the big question is this: how much time can he put into Armstrong, and how will he cope against the lighter man in the mountains? Let's go back to Analytic Cycling and do some more number-crunching. We have Lance's power over one hour as being 500 W; however this stage will take a little longer than that so we're going to dock both men 5 W, giving us 495 W for Lance. C_dA is still 0.26 m^2 so this time we get an average speed of $50.94 \text{ km}\cdot\text{h}^{-1}$, and a time over 60 km of $1'10''40.28$. For Miguel we take his hour power of 510 W, dock him 5 W (505 W) and get an average speed of $51.12 \text{ km}\cdot\text{h}^{-1}$, and a time over 60 km of $1'10''25.35$. So as we expected it's another slender win to Miguel; but is it enough? At first glance I thought these speeds looked a little high; however bear in mind that these stages are absolutely flat and windless. A look back at last year's Vuelta shows that Tyler Hamilton's average speed on a flat windless 40 km course was $50.96 \text{ km}\cdot\text{h}^{-1}$, so we still appear to getting some realistic results.

Results- Stage 8 First ITT (60 km)

1. Miguel Indurain (SPA) $1'10''25.35$

2. Lance Armstrong (USA) @ 14.93 seconds

General Classification

1. Miguel Indurain (SPA) $32'58''55.65$
2. Lance Armstrong (USA) @ 21.9 seconds

The Mountains

Looking at the GC after the first week it would appear that Miguel Indurain's greater power output (partly due to his greater body mass) has given him the upper hand. However the Alps are here and that extra mass is going to start to become a liability. Remember we said that only the last climb of each day was going to be counted? The first big mountain stage of our virtual Tour finishes on the mighty Col de Galibier. Now I know a real Tour stage would never finish on top of the Galibier, but this is a virtual Tour so we can do what we like. Approached from Valloire this monster climbs from 1401 m to 2646 m at an average gradient of 6.9%, and lasts for 18.1 km. On climbs like these the main force which is trying to slow or stop a rider ceases to be aerodynamic drag and becomes gravity. Dan Heil reports that Lance's ideal racing mass is around 71 kg, although this is once again an anecdotal figure. We have another data point for this one: in the Coyle paper, Ed Coyle notes that Lance submitted a mass of 72 kg as his 'racing' weight. As this is seemingly one step nearer the source let's use that number rather than Heil's (although they are similar enough to each other to lend pretty serious credence to both). Once again our data for Miguel is a little better: weighed in the lab, Indurain's mass was recorded as 81 kg. How much difference does 9 kg make? For the sake of our virtual Tour we are going to give both riders state-of-the-art climbing bikes, both at the UCI minimum weight limit of 6.7 kg. We are also going to assume that they both throw away their bidons at the bottom of the final climb of the day and that the weight of their clothes and shoes is negligible (or equal).

Until now both men have been playing a waiting game. However Armstrong has time to make up. As they hit the lower slopes of the Galibier he glances over his shoulder at the opposition.....and goes! Let's plug our figures into the model and see what might happen. Both men are tired after a long day in the saddle so we're going to dock them each 10 W. Also C_dA changes markedly as both men are now

riding standard road bikes, most likely with their hands on the 'tops'. A typical C_dA under these conditions might be $\sim 0.4 \text{ m}^2$ ³. Taking all these things into account, Armstrong's average speed on a 6.9% climb comes out as $25.632 \text{ km}\cdot\text{h}^{-1}$ and his time up the Galibier comes out at 42''22.14. What about Indurain? How much will that extra 9 kg cost him? Well he can still climb a gradient such as this at an impressive $24.336 \text{ km}\cdot\text{h}^{-1}$ but it's not enough to stay on terms with Armstrong. Indurain's time up the Galibier is 44''37.52. Remember I said that we would try another little 'check' at some point to make sure we were on the right track. I have some times for both Armstrong and Indurain up an identical stretch of Alpe d'Huez⁶. These show that Lance climbed this section in $\sim 94\%$ of the time it took Miguel a few years earlier. Looking at our modelled times up the Galibier, 94% of Mig's time of 44''37.52 is 42''23.64. It seems as though our results are plausible. At the end of the first day in the mountains Lance has pulled back a whopping two and a quarter minutes, and turned a 22 second deficit into nearly a two minute lead. With four more days in the mountains things are looking good for 'The Clockwork Texan'!

Results- Stage 9 Col de Galibier (18.1 km)

1. Lance Armstrong (USA) 42''22.14
2. Miguel Indurain (SPA) @ 2''15.38

General Classification

1. Lance Armstrong (USA) 33'41''39.69
2. Miguel Indurain (SPA) @ 1''53.48

Over the next 10 days or so we have four more decisive climbs: Alpe d'Huez and Mont Ventoux followed by a short break, and then Luz Ardiden and the Tourmalet. Adding these four climbs together gives us a massive 5127 m of climbing spread out over 72.1 km at an average gradient of 7.1%. This Herculean task takes Lance Armstrong just 2'51''25.31 seconds. Miguel on the other hand, whilst still an awesome climber, is starting to suffer. The same feat takes him 3'00''58.43, a combined loss of nearly ten minutes to the lighter man. By the time we leave the Pyrenees, Lance leads the Tour convincingly.

General Classification (after the high mountains)

1. Lance Armstrong (USA) 36'31''40.91
2. Miguel Indurain (SPA) @ 11''26.6

The Final Time Trial

So with the mountains behind us, Lance leads our virtual Tour with just the final time trial to go. He has a huge advantage (eleven and a half minutes) over the mighty Spaniard, and although Armstrong has already been beaten twice in the individual time trials there is no hope that even Miguel Indurain could make up such a huge gap in a single day. There are questions we can never hope to answer: for example, would Lance have attacked every day in the mountains (probably not). Knowing that Indurain would probably be able to beat him in the final time trial, what sort of advantage would Armstrong have considered safe? It's clear by now that the route itself would be a decisive factor, with mountain-top finishes favouring the American and flat time trials giving an advantage to the Spaniard. Unfortunately for Miguel our virtual route has too many of the former and not enough of the latter, and Lance is comfortable going into the last few days.

Getting back to the action there is still the small matter of pride at stake. The final time trial includes a small climb which I've modelled on the last hill in the Galliac – Cap Decouverte stage of the 2003 Tour, the time trial stage where Jan Ullrich handed Armstrong possibly the most convincing beating of his Tour time trial career. This section (from Monesties to Blayes Les Mines) rose 111 m in 5.5 km, an average gradient of 4.9 %. Otherwise our time trial will be flat. As Lance is currently leading, Miguel goes off first. How much time can he pull back from the Texan in the final time trial? Don't forget that our men are back on their TT machines, so C_dA drops back to 0.26 m^2 . For the ultimate test we're going to dock both men 10 W: 5 W for the length of the stage and another 5 W because they've been racing for three weeks. The opening, flat section is 54.5 km long; Indurain covers it in an astonishing 1'04''11.59. Armstrong is off second; his time at the first checkpoint: 1'04''25.25! It's incredibly close; Indurain is 14 seconds ahead as they hit the final climb. The Spaniard thunders up the short hill. He finally rolls across the line with a time of

1'14''45.23. Will it be enough? Everyone holds their breath as Lance pounds up the climb which punished him so badly in 2003 and comes in with a time of..... 1'14''32.2. Lance has won the stage and the Tour!

Results- Final ITT (60 km)

1. Lance Armstrong (USA) 1'14''32.2
2. Miguel Indurain (SPA) @ 13.03 seconds

Final Standings

1. Lance Armstrong (USA) 37'14''03.92
2. Miguel Indurain (SPA) @ 11''39.63

Conclusion

Hopefully this piece has helped give you some insight into what performance modelling is and why it can be so useful. It should have gone some way to explaining why British time-trialist Michael Hutchinson decided to attempt the world hour record last year, and probably why he so valiantly failed. It might also have helped you to understand why power meters have become ubiquitous in the pro peloton (and perhaps why their potential might still be being underexploited). When I wrote the first draft of this article I sent a few copies to friends of mine in the cycling and scientific communities. The feedback I got was uniformly positive (after I'd reminded them that this was only supposed to be a bit of fun!), although many of them questioned the numbers I've chosen to use. However it was my intention from the very beginning to use published figures only, even though strong arguments can be made that these numbers might be slightly wrong. Interestingly when I first started working out the results I made a mistake in my calculations which led me to use a value of 490 W (10 W less) as Lance Armstrong's 'hour power'. Guess what happened? He still won the Tour, but this time by less than a minute. Funnily enough this figure (490 W) has been suggested elsewhere as Armstrong's actual power output. One friend who responded also reminded me that Miguel Indurain's mass was recorded in September, at least a month after he had last won the Tour; he almost certainly would have weighed somewhat less during the race itself. Add that to the entirely plausible figure quoted above for LA's power

and the outcome of the whole 'race' would almost certainly have been different. At the end of the day the real take-home message of this whole article is this: 10 W here, a kilogram or two there. It is by margins such as this that the Greatest Race on Earth is won or lost.

© Lindsay Edwards 2005

You can contact Lindsay via his website: www.science4sport.com.

References:

1. Coyle, E. F. Improved muscular efficiency displayed as 'Tour de France' champion matures. *J Appl Physiol*, 2005.
2. Heil, D. P. Body size as a determinant of the 1-h cycling record at sea level and altitude. *Eur J Appl Physiol*. 93:547-554, 2005.
3. Martin, J. and J. Cobb. Body position and aerodynamics. In: High-Performance Cycling. A. Jeukendrup (Ed.) Champaign, IL.: Human Kinetics, 2002, pp. 103-112.
4. Martin, J., D. Milliken, J. Cobb, K. McFadden, and A. Coggan. Validation of a Mathematical Model for Road Cycling Power. *J Appl Biomech*:276-291, 1998.
5. Padilla, S., I. Mujika, F. Angulo, and J. J. Goiriena. Scientific approach to the 1-h cycling world record: a case study. *J Appl Physiol*. 89:1522-1527, 2000.
6. Siohan, F. Unpublished observations, 2004.

Club Racing

Report by Robert

Saunders

I haven't received too much in the way of reports of open racing events. However, here is a synopsis of what's been going on.

Club evening time trials

Our series of evening events continue to be well-supported - some 10s having upwards of 28 riders, many of whom are new to club cycling. Tony Farmborough is still working hard at the time-keeping, with a lot of help from Bryan. In fact two of them aren't enough for some of the events, and additional help has had to be drafted in!

The club championships were run at Astwood (2 laps) on 6th July. Leigh Smith was the clear winner with 46:59 on a blustery evening. Full results are available on the club website.

Open Time Trials

Several of us have been making regular outings at open time trials. Ian Stokes got within a whisker of

an all-time PB for 25 miles at a recent event on the F20/25. Robert Saunders struggled painfully round the North Midds '100', finishing with 4:19:56 after battling against cramp. In the Norlond '50' both Robert and Tony Parks struggled against a horrendous head wind, finishing well outside 2 hrs, on a day which saw about half the field pack/

But enough of Robert's horrendous season: the big news is that Tony Parks is going from strength to strength. His triumphs include just narrowly failing to go under the hour on a medium gear 25, in so doing set a new club record.

Track

Tony forwarded an email from Rob Gregory:

Just in case anyone was interested, I sprinted home to 5th place at the national masters track champs on friday. with a bike replaced two days before for the work bike I had to ride and a 84 inch gear I was totally unprepared for the whole event but through some lucky tactics came out better than expected.

Club Clothing

Wayne advises he will be placing an order for club clothing. In future we will only obtain clothing for which members have placed firm orders. There are some items in stock, ask Wayne for further details.

North Bucks Clothing Price List for 2005 (updated 050205)

Check www.impsport.co.uk for further details

Code	Item	Style	2005 Price (£)
A1	S/S SKINSUIT	N/A	68.80
A2	L/S SKINSUIT		71.10
A9	BIBSHORTS		54.70
A11	ARMWARMERS		13.00
B1	S/S ROAD JERSEY	NORM ZIP	41.20
B1	S/S ROAD JERSEY	FULL ZIP	42.30
B2	L/S ROAD JERSEY	FULL ZIP	44.70
B11	SLEEVELESS RAIN JKT (GILLET)	FULL ZIP	36.50
C1	THERMAL TRAIN JKT	N/A	55.90
E1	TRACK MITTS	N/A	12.40
E6	RACE CAP		5.30

OTHER ITEMS PLEASE CALL FOR 2005 PRICE

(late), although i did hear it was something to do with a fracure over who had the last slice of bacon.

Anyway 8.45am saw the jolly boys swooping (well sort of swooping) through the French countryside, within 3 miles we were braving the steep descent down to the beach. This high point was soon overshadowed, with the long climb up from the beach. Colnago Tony was working admirably at the front with Brian & Chris setting a quick pace up the hill. After a few miles of rolling hills we soon settled into the pace, which was pretty constant for the rest of the day. A long twisting descent early on, almost saw our first casualty when Tony braked from 40mph in a corner, lost the back end of his Colnago & how he managed to not drop the thing, no-one knows. Despite the route following in an opposite direction from last year, the route markings were clear, the (relatively few) car drivers courteous & everyone's spirits were high.

What a sight to behold, with French villagers stopping from their daily routine to cheer on the mighty NBRC train. One woman (of mature years) we even saw again in a village a few miles on, however on her second appearance she seemed to be holding what looked like a French CSA form & was gesturing towards Swiss Tony, not sure what that was about.

With a pace of around 16.7mph, we made the 45 miles to the half way Chateau stop in good time. The only blight in our copy book, being Dick, who disappeared down a short cut, to re-appear a little way further on, we will be stripping him of his points jersey later this week, after the UCI investigations are complete, unless he wishes to return & complete the course correctly that is..

Life at the Chateau was fine, where our 6 Euro ride entry fee, also bestowed upon us a banquet fit for a king, all free of charge. Our French hosts were most hospitable & accommodating with nothing too much trouble. The lunchtime photo shoot (not sure if it was for the official NBRC 2006 calendar) saw a young girl rush over & give Swiss Tony her teddy bear for the pic (I'm told that this was in no way connected with the CSA incident of earlier).

Upon leaving the Chateau after our 30 minute stop, we found ourselves travelling along a ten mile cycle track on what was the old railway line. We soon reached & maintained a steady pace of 18 - 20mph, with comparative ease. However upon leaving the track, we found ourselves on a steady climb

into the woods. The road soon darkened as we were surrounded by trees & the 11 strong pack (yes we had all managed to stay together) soon settled into a couple of groups. After what seemed an eternity we made the false flat, checking the computer the hill was just over 2 miles long, with at least another half a mile of false flat. Upon reaching the end of hill, Swiss had punctured (amazingly the only mechanical incident of the entire weekend), still at least it gave him the opportunity to use his Campagnolo tyre levers (are all of his possessions branded by the Italian master).

After a few descents on deserted French roads, with the absence of the usual English pot holes, we found ourselves in the valley on the final leg with a stiff headwind. We soon organised ourselves into the NBRC train (only to be rivalled by the Seaco train of TDF fame) with the Russell & Tony show going on at the front end. The pace soon got moving & we stayed as a smooth finely oiled machine for the entire length of the valley, which finished in another long steep climb.

The run from the top of the climb into Dieppe, became a little dis-jointed with the directions becoming a little vague. So after 87 miles together we split into two groups for the last three miles, with the groupo Swiss Tony going up the east side of the town & the gruppo Brian, going up the west . This & Tony's almost horrific crash became the only minor blights on what was a very exhausting, but enjoyable 90 miles, for a group of riders who stayed together (well almost) for the course.

Unfortunately the calling by Mr Kronenburg proved too much of a distraction for the young folk, leaving, Swiss Tony , Chris, Dick & Dave to collect the award for Les being the oldest competitor, despite the fact he was still tucked up safely in blighty.

For the evening we headed into town, when Swiss showed us why he was called Dr Doolittle in a previous life, by catching a pigeon in his bare hands. The local pizza restaurant, saw us assemble on mass. Where the pretty waitress, captured the hearts of many & left them dribbling down their old skool (not a spelling mistake) cycling jerseys.

The return journey the following day, went without incident, apart from the ferry almost colliding with a container ship. Russell even managed to keep his lunch down, unlike last year.

On the whole everyone came away

from this experience having learnt something about themselves & their fellow cycling buddies. Andy the fact that bicycles are meant to be kept in the bedroom, Colnago Tony learnt the stopping power of the Dura-Ace rear brake, Brian learnt that *tournez a droite* means to turn right & was not me calling him a twat, although the two do sound very similar & i think everyone agreed to give the Barbara Windsor a miss next year.

NBRC Club League

Name	Cat	L	Overall Points to date	LR1 6/4/05 SS		LR2 20/4/05 A5		LR3 4/5/05 Astwood		LR4 25/5/05 Astwood		LR5 8/6/05 SS		LR6 22/6/05 A5					
				Time	Pos	Points	Time	Pos	Points	Time	Pos	Points	Time	Pos	Points	Time	Pos	Points	
Lindsay Edwards	S	1	510					26.13	4	120	26.22	4	120	28.30	1	150	22.18	4	120
Ian Marshall	S	1	420	29.49	3	130		23.48	1	150							21.49	2	140
Rob Saunders	V	1	410					24.47	3	130	23.42	1	150				21.54	3	130
Leigh Smith	S	1	300	28.25	1	150		24.35	2	140	DNF						21.03	1	150
Phil Sinnett	S	1	240								25.20	2	140				22.33	6	100
Ian Stokes	V	1	230														23.19	7	90
Tony Parks	V	1	140	29.27	2	140					25.27	3	130						
Wayne Maguire	V	1	130																
Kevin Stokes	V	1	110																
Chris Hartley	V	2	475	34.26	4	120		28.22	6=	95	28.11	8	80	31.53	3	130	25.00	11	50
Gilbert Wheelwright	V	2	475	36.44	5	110		28.22	6=	95	26.58	7	90	32.02	4	120	24.55	10	60
Brian Premmit	S	2	380					29.20	9	70	26.36	6	100	30.27	2	140	24.45	9	70
Dave Garrard	V	2	350	38.08	7	90		30.04	10	60	28.49	11	50	33.56	5	110	29.21	16	40
Andy Lambeth	V	2	268					26.53	5	110	26.34	5	110				25.15	12	48
Alan Lawson	S	2	238					32.00	12	48	29.36	12	48	34.45	6	100	26.56	15	42
Dick Selley	V	2	194	38.07	6	100		30.43	11	50							26.40	14	44
Gordon Batcock	V	2	150					29.04	8	80	28.13	9	70						
Russell Page	V	2	106								28.18	10	60						
Julian Hall	V	2	80																
Peter Forster	V	2	46					34.03	13	46									
Warren Stokes	J	2	0								DNF								

This is the current League table very kindly prepared by **Gilbert**, and shows the total points accrued by each rider in the League events held to date. Note that one round was abandoned - it may be replaced with a later event.
Robert

Result of the NBRC *Club Championship* time trial on Wednesday 6th of July 2005. Held over two laps, (20miles) of the F5V/10 Astwood course.

place	name	Club	time	split
1 st	Leigh Smith	NBRC	46.59	22.51
2 nd	Jason Gurney	TeamMK	47.56	23.17
3 rd	Rob Saunders	NBRC	51.28	24.51
4 th	Steve Holfeld	TeamMK	52.50	25.13
5 th	Heath Jackson	NBRC	54.52	26.27
6 th	Daren Haseldine	Team Tri-uk	55.16	26.54
7 th	Jason Whittam	Unattached	55.50	27.37
8 th	Andy Lambeth	NBRC	55.51	27.34
9 th	Brian Premmitt	NBRC	56.04	27.15
10 th	Clive Faine	TeamMK	57.12	27.44
11 th	Tracey Haseldine	Team Tri-uk	58.06	28.19
12 th	Gilbert Wheelwright	NBRC	58.11	27.43
13 th	Louise Prole	TeamMK	58.35	28.31
14 th	Chris Hartley	NBRC	59.02	28.50
15 th	Stuart Jardine	Unattached	59.06	28.49
16 th	Russell Page	NBRC	1.00.37	29.03
17 th	Richard Stanton	Unattached	1.02.27	30.02
18 th	Alan Lawson	NBRC	1.02.49	30.39
19 th	Dick Selley	NBRC	1.04.27	31.47
20 th	Al Nisbit	TeamMK	DNF (punctured)	