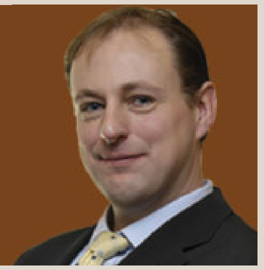
THE JAMES WILLOUGHBY COLUMN



In his first season as sole licence holder, Charlie Johnston produced a training performance out of the top drawer when The Gatekeeper won on Champions Day at Ascot. The four-year-old missed a season and a half with injury after running in the 2021 Coventry Stakes but was produced quite brilliantly by Charlie to win the £200,000 Balmoral Handicap on his 15th start of the season.

TO WIN the Balmoral Handicap, The Gatekeeper had to come through 15 races since a serious injury as a juvenile threatened to finish his career. In total in that career he had reached the frame 11 times before his triumph on Champions' Day, leaving him seemingly exposed to the handicapper who had raised him by a net amount of 11lb in 2023. While similar types have done well in the history of the Balmoral, he was sent off at 25-1 for a reason: a mark of 96 seemed to represent his ability to the maximum.

Several factors enabled The Gatekeeper to prevail. Most of all, he raced with tremendous enthusiasm. While this is a characteristic of all his best performances, it was still amazing to watch given how long he has been on the go. This generosity enabled him to take advantage of both a favourable draw and the tendency of the dead surface at Ascot to favour horses ridden up with the pace.

We can also appreciate the ride given to him by Joe Fanning by looking at the sectional times. The Balmoral was the sixth and last of the races on Champions Day and the track was riding slower than earlier in the meeting. For this reason, it was particularly hard to know the speed of the surface. But this is of little importance in the analysis of sectional times: to understand efficiency, we need to compare a horse only with itself.

This is what I mean. Each race over the straight mile at Ascot leaves a sectional 'footprint'. But the raw sectionals do not correspond with the effort each horse makes unless we allow for several factors. Chief among these is the ability of the horse itself, for Frankel might find it easy to be going at a pace which would exhaust 0-90 handicappers.

Sectionals on different days, or even on the same card, need to be normalised for the differential effect of the going or the wind. The latter is still the most underrated factor which affects race times – it is completely ignored in many quarters when making judgements about the speed of the surface.

So, instead of using the split times as they were recorded, we can express each as a percentage of the total time which, to a certain extent, negates the effect of the going or changes in wind conditions between different days and even different races on the same day.

Here is how it works. Table 1 shows the sectionals (publicly available via attheraces.com) for The Gatekeeper in the top row, with the same numbers expressed as a percentage of his total time of 1m 47.11s (107.11s) in the second row.

The figures in the second row are all smaller than those in the first row because The Gatekeeper's total time was greater than 100 seconds. Now, we have the numbers in a format to compare the way the race was run – and appreciate yet another superb ride by Fanning – with some platonic ideal of how to run the straight mile at Ascot in the fastest possible time.

The underlying physics here is the same Sir Roger Bannister relied upon when breaking the four-minute mile barrier in 1954. Bannister was a very good athlete and exceptionally gifted academically. He knew that the race time an athlete records bears a *sensitive dependence* on the split times around the course. The term in italics is one used in a field of maths known as chaos theory to describe how small perturbations in a dynamic system can cause much larger variations in some outcome of interest. In this case, each deviation from ideal pace weakens the metabolic efficiency of the athlete and causes an increase in the final time of the race.

With horses as with humans. The dynamical system in horse racing is much more complicated to analyse because

	Start - 7f	7f - 6f	6f - 5f	5f - 4f	4f - 3f	3f - 2f	2f - 1f	1f - Finish
Actual	15.70	12.76	13.00	12.95	12.53	12.20	13.21	14.76
% of total time	14.66	11.91	12.14	12.09	11.70	11.39	12.33	13.78

Figure 1: The Gatekeeper's split times for the Balmoral Handicap over the straight mile at Ascot

	Start - 7f	7f - 6f	6f - 5f	5f - 4f	4f - 3f	3f - 2f	2f - 1f	1f - Finish
Actual	15.70	12.76	13.00	12.95	12.53	12.20	13.21	14.76
% of total time	14.66	11.91	12.14	12.09	11.70	11.39	12.33	13.78
Ideal	15.04	11.75	11.75	11.87	11.92	11.87	12.58	13.23
Deviation	-0.38	+0.16	+0.39	+0.22	-0.22	-0.48	-0.24	+0.55

Figure 2: The Gatekeeper's split times compared with the notional 'ideal' over the straight mile

of the variation in conditions, even within a race. But, unlike the public reputation of science, the point of mathematical abstraction is to make better guesses. If a new drug is being tested for use on humans, we set a high threshold on the accuracy of our guesswork; if we are trying to understand horses running round a field, the margin of error for making useful discoveries is greater.

The age of incuriosity

TO MY mind, racing loses a lot of its magic if the action on the track is not quantified, contextualised, subject to objective analysis. "Don't believe half of what you see and none of what you hear," says Lou Reed in The Last Great American Whale. He was talking about hypocrisy, but he could have been talking to the television viewer nowadays.

Seeing was believing in the case of the Balmoral Handicap. Fanning really was as good as he looked, but to understand why exactly his ride was so effective requires second-level understanding.

First, let's contextualise how The Gatekeeper ran. To do this, we need to use the performances of every horse that has run the straight mile at Ascot in recent seasons, using sectional footprints – just like The Gatekeeper's in Figure 1 – of those who have achieved fast times to find out how to do a 'Roger Bannister' and run the fastest possible time.

Figure 2 builds on the information contained in Figure 1. The third row has the so-called 'ideal fractions' according to my calculations, scaled as a percentage just like The Gatekeepers are in the second row. The bottom row is then the difference between the two rows above – how close The Gatekeeper came to the ideal. Red squares are sectionals when the horse ran harder than the ideal, while green squares denote the opposite.

By means of the bottom row of Figure 2, we can see that Fanning asked The Gatekeeper early to get a prominent position; it had seemed an advantage to position horses forwardly all day. Once there, Fanning rationed the Gatekeeper's speed to halfway, as the three consecutive green squares show.

Pressed all around, especially by other favourably drawn horses, Fanning squeezed the accelerator gently to get down to the three-pole before making his race-winning move over the next quarter mile. With the race in the bag and a clear advantage, The Gatekeeper had enough in hand to hold on, despite a slow final furlong.

What made Fanning's ride so good

NO JOCKEY can ever guide a horse through perfect fractions, but those described by Fanning on The Gatekeeper come close. What made his ride most effective was the state of conditions, which seemed cloying and appeared to favour horses ridden prominently. It paid to try to build up a cushion before the closing stages, and Fanning did this to great effect.

What AI can do to understand pace

NOWADAYS, Artificial Intelligence is becoming increasingly tractable for learning problems such as racing throws up. Indeed, exactly this led researcher Pierre Colle to release a paper called What AI Can Do For Horse Racing (https://arxiv.org/pdf/2207.04981.pdf) in 2022.

A neural network can detect the differences the sectionals of winning and losing horses by finding the best combination of all their sectionals. This can answer the question of which furlong is the best one for a horse to make its move. And anyone who conducts this exercise will immediately find that the general answer: either very early in a race or very late.

In the early stages, the field often take too long to reach their cruising speed. So, any lengths gained tend to be cheaply acquired. And this is also true at the end of the race, for the final furlong is both the easiest place to make ground and the most dangerous in terms of leaving a run too late.

But each meeting, each set of conditions, provides a different context. At Ascot, lengths gained in the first part of the race were cheaper than at the end because the surface was tiring – if a jockey saved a horse's energy early it was not returned late. The winners tended to finish slower than would normally be expected on fast ground, and Fanning's ride was an almost perfect match for what was required. ■