Genetic signatures of coancestry within surnames

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Summary

Surnames are cultural markers of shared ancestry within human populations. The Y chromosome, like many surnames, is paternally inherited, so men sharing surnames might be expected to share similar Y chromosomes as a signature of coancestry. Such a relationship could be used to connect branches of family trees [1], to validate population genetic studies based on isonymy [2], and to predict surname from crime-scene samples in forensics [3]. However, the link may be weak or absent due to multiple independent founders for many names, adoptions, name-changes and non-paternities, and mutation of Y haplotypes. Here, rather than focusing on a single name [4], we take a general approach by seeking evidence for a link in a sample of 150 randomly ascertained pairs of males who each share a British surname. We show that sharing a surname significantly elevates the probability of sharing a Y-chromosomal haplotype, and that this probability increases as surname frequency decreases. Within our sample, we estimate that up to 24% of pairs share recent ancestry and that a large surname-based forensic database might contribute to the intelligence-led investigation of up to ~70 rapes and murders per year in the UK. This approach would be applicable to any society using patrilineal surnames of reasonable time-depth.

Results and Discussion

150 men carrying different British surnames were recruited through local and national advertisement. In the 1996 UK electoral registers a total of ~5.75 million people (~13% of the population) carry these 150 surnames, and names of English, Scottish and Welsh origin are represented in the set in approximately

the same proportion as in the national population of Great Britain. A second cohort of 150 men, matching the surnames of the first and chosen randomly from electoral rolls, was also recruited.

We analysed the non-recombining region of the Y chromosomes of the two cohorts using a set of 11 binary markers, defining a maximum number of 12 haplogroups (Figure 1a; Supplementary Table), of which ten were observed (Figure 1b). Under a hypothesis of a perfect surname-Y chromosome correlation the cohorts should have identical haplogroup compositions. Unsurprisingly, this is not so (Figure 1b), although, judged by a population differentiation test, they are not significantly different ($p=0.325\pm0.022$).

The ages of mutations defining the haplogroups greatly predate the time of surname establishment (which is ~700 years [5]) as demonstrated by their widespread geographical distributions [6, 7] and by time-to-most-recent-common-ancestor (TMRCA) estimates [8]. Therefore, if the Y chromosomes of two men sharing a surname belong to different haplogroups, they cannot share recent common paternal ancestry. Of the 150 same-surname pairs, only 43% (65 pairs) fall within different haplogroups, while the average figure when pairs are permuted 1000 times is 57% (85 pairs). Thus, even for randomly ascertained pairs, sharing a surname significantly ($p<0.001$) elevates the probability of sharing a haplogroup.

Since many rare surnames probably had single founders, while common surnames had multiple founders [5], we next asked how surname frequency affects the probability of haplogroup sharing. The 150 surnames can be ranked by frequency from *Smith* (carried by 560,000 people) to *Rivis* (50 people), and

cover a broad range of the frequencies found in the commonest 40,000 British surnames (Figure 2a).

Rare names are strikingly more likely to share haplogroups than are common names (Figure 2b). In the highest-frequency decile, only 7/15 surname pairs share a haplogroup, as opposed to 14/15 for the lowest-frequency decile ($p=0.001$). In the high-frequency half of all surname pairs, 47% share a haplogroup, while in the low-frequency half the figure is 69% ($p<0.01$). Furthermore, a greater proportion of the sharing observed within the high-frequency half probably occurs by chance, since it is overwhelmingly (91%) in hg R1b (Figure 2c), the most prevalent haplogroup in the population (Figure 1). By contrast, in the low-frequency half, only 65% of sharing is within hg R1b, and there are examples of sharing within the rare haplogroups (R1a, G, DE, J2 and K*), which strongly suggests that the sharing is due to common ancestry.

Haplotypes based on multiple Y-specific microsatellites represent more sensitive indicators of recent coancestry. They are highly variable and have much lower average population frequencies than do haplogroups, so chance sharing is less likely. We therefore determined 17-locus microsatellite haplotypes for the two cohorts (Supplementary Table), and compared haplotypes within surname by considering the number of mutational steps between each member of a pair (Figure 2c). As expected, the mean number of mutational steps in the 65 different-haplogroup surname pairs is greater than that in the 85 same-haplogroup pairs (13.67 vs 4.05), although the ranges overlap.

There are 16 examples of same-surname identical haplotype pairs (zero mutational steps difference). All are also same-haplogroup pairs, and all but one (surname *Major*, carried by ~5600 people) lie in the lower-frequency half of the

sample. These are all likely to indicate shared recent coancestry associated with surname: a permutation test in different-surname males (within-cohort) finds no examples of identical haplotype pairs ($p<0.001$).

Haplotype pairs that differ by only a small number of microsatellite steps might also reflect surname-related coancestry, with divergence due to mutation. To estimate what proportion of the sample this represents, we calculated TMRCA [9] for each within-haplogroup pair (Figure 2d; Supplementary Table). Assuming a 35-year generation time (see Methods), and that surnames were established 700 years ago, the maximum expected time to a common surname-ancestor for two men is 20 generations. From the proportion of the probability distribution for each TMRCA estimate lying below 20 generations, we estimate the most probable value for the proportion of surname pairs sharing coancestry as 11%. For the 16 surname pairs having identical haplotypes, the median value for TMRCA (11 generations) lies well within the time of surname establishment. For an additional 20 surname pairs the median lies outside this time, but the lower bound of the TMRCA 95% credible region is less than 20 generations, and so up to 24% of the sample of surname pairs plausibly shares coancestry through shared surname.

We have taken the most conservative possible approach to examining surname-Y chromosome links by choosing the smallest sample size – a pair – and sampling completely randomly. The strong signal of coancestry observed in up to a quarter of the pairs under these conditions suggests that studies of larger samples within surnames (particularly the rarer names) are worthwhile. They should reveal clear associations with Y haplotypes, allowing more precise estimates of TMRCA, and inferences about founder numbers and historical non-

paternity rates. Our findings indicate that inbreeding coefficients estimated from isonymy [2] should be modified to reflect departure from a perfect relationship between surnames and genetics, and that this modification could be made in a surname-frequency-dependent manner. DNA-based genealogical research is a burgeoning area of privately commissioned genetic testing, and this study both validates the general approach, and suggests a caveat: if two randomly ascertained men who share a surname often share a 17-locus microsatellite haplotype, then many more markers will need to be tested to support a more specific historical link.

Finally, this study allows a first judgement to be made about the feasibility of drawing forensically useful conclusions about surnames from Y haplotypes. From our preliminary data we can ask what the chance is of correctly predicting a surname from a Y profile (we ignore haplogroup here, since routine forensic profiling utilises only microsatellites). If we use Cohort 1 to represent a database of surnames and associated Y profiles, and assign each Cohort 2 haplotype the surname(s) of the nearest Cohort 1 match(es), the correct surname is among the predicted names in 28 cases (~19%), with a mean number of only 1.3 predicted names (range 1-6), and a mean of 0.54 microsatellite step difference (range 0-3). The approach is most successful for less common names, with 27/28 correct predictions being made between *Major* (rank 71) and *Rivis* (rank 150), corresponding to a 34% chance of correct prediction in this sub-sample of 80 names. Individuals carrying the ~39,000 names within this frequency range represent ~42% of the population, and if we extrapolate from our estimated success rate to a potential ~25-65 no-suspect murders and ~300-400 no-suspect rapes that include unidentified DNA samples and remain undetected for a

significant period each year in the UK, an idealised database containing the ~39,000 names with associated Y profiles could contribute to the intelligence-led investigation of up to 10 murders and 57 rapes per year. While we do not expect a perfect prediction system to emerge, surnames suggested by a Y-DNA profile could be combined with existing intelligence to allow a pool of suspects to be identified; Bayesian statistical adjustments could also be applied to predictions based on local demographic factors – for example, a requirement for local knowledge in a perpetrator could prioritise local surnames. The approach has additional benefits: it would have deterrent value because it targets individuals whose profiles are not on DNA databases, and it should therefore allow perpetrators to be apprehended early in their criminal careers. Though our sampling was in Great Britain, DNA-based surname prediction is in principle applicable to any society having diverse patrilineal surnames of reasonable time-depth.

Experimental procedures

DNA samples

In sampling, we avoided: (i) individuals for whom information collected about their paternal grandfather's surname, first language and birthplace indicated recent name changes, or origin outside the UK; (ii) surnames that represent recognised spelling variants of other names in the set; and (iii) surnames with incidence <50 (of which there are very many), because of the high probability of accidentally sampling closely related men; a specific questionnaire was also used to exclude close patrilineal relatives. Sampling was with informed consent, and followed ethical review by the Leicestershire Research Ethics Committee (ref. 5796). DNA donors self-sampled buccal cells using a cytology brush (Rocket Medical), and suspended them in 0.75ml NDS (0.5M EDTA, 10mM Tris-HCl, 1%[w/v] sodium lauroyl sarkosine, pH9.5). At this stage samples could be stored apparently indefinitely at ambient temperature without loss or degradation of DNA. DNA was extracted from 200μl of suspension using the QiaAmp kit (QiaGen) according to manufacturer's instructions.

Y haplotyping

Binary markers shown in Figure 1a [10] were typed in two multiplexes using the SNaPshot minisequencing procedure (Applied Biosystems) and an ABI3100 Genetic Analyzer (Applied Biosystems). Primer sequences were as described [11]. Note that the five chromosomes classified here as belonging to hg R1* have been previously shown [12] to be derived for the marker M269, and therefore to carry a reversion of the marker P25. Seventeen Y-specific microsatellites (DYS19, DYS388, DYS389I, DYS389II, DYS390, DYS391, DYS392, DYS393, DYS434,

DYS435, DYS436, DYS437, DYS438, DYS439, DYS460, DYS461, DYS462) were typed in three multiplexes as described [13].

Analysis

Surnames were ranked by frequency using information from the 1996 UK electoral registers, covering those aged 18 and over who register themselves to vote, and including 43.776 million persons (a population coverage of ~96%). Geographical origins of surnames were estimated by K.S. from their historical distributions. Population differentiation tests were carried out using Arlequin [14]. Significance testing using permutations was done using programs written in PERL, and a p value of <0.001 assigned when an observed value was not attained in 1000 permutations. TMRCA estimates (median value, and bounds of the 95% credible region) based on microsatellite haplotype differences for within-haplogroup pairs were calculated by the method of Walsh [9], implemented in Mathematica 4.2, using a mean per-locus, per-generation mutation rate of 0.002 [15, 16] and $\lambda=1/5000$ under a single-step mutation model. Mean male generation time for the period after 1550 in England was estimated as 35 years, by adding the mean difference between ages of marriage partners to the mean age at maternity [17]. Generation time prior to 1550 is likely to be lower, but is difficult to estimate [18], so we use the conservative value of 35 years for the entire period since 1300. The approximate number of murders and rapes where unidentified DNA material might benefit from surname prediction analysis was estimated from current offending and laboratory submission rates, and the success rate of the National DNA Database; in practice, the individual circumstances of each case affect whether samples are taken beyond initial database and/or suspect comparison.

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Figure Legends

Figure 1: Y-chromosomal haplogroups in the two surname cohorts

a) Binary marker phylogeny of the Y chromosome, showing the typed mutations on the branches of the tree, and haplogroup names [7, 10] to the right.

b) Haplogroup profiles of surname cohorts 1 and 2. Areas of filled circles are proportional to haplogroup frequency, and unfilled circles indicate unobserved haplogroups. Numbers of individuals are given to the right of circles.

Figure 2: Relationship between Y-chromosomal haplotype and surname frequency

a) Distribution of frequencies of the 150 sampled surnames. Surnames bounding each frequency decile are shown at the top.

b) Haplogroup sharing within surname pairs. The upper panel shows same-haplogroup pairs ranked by frequency, with each symbol representing a pair, and colour indicating haplogroup. The lower panel shows different-haplogroup pairs, with two differently coloured symbols representing each pair. 'hg': haplogroup.

c) Microsatellite mutational steps between haplotypes within surname pairs. Symbols for same-haplogroup pairs are coloured as in (b); different-haplogroup pairs are indicated by unfilled symbols.

d) TMRCA estimates for same-haplogroup surname pairs. Coloured symbols (as in [b]) indicate the median, and bars the limits of the 95%

credible region for each estimate. The grey-shaded area represents approximate time since surname establishment (the past 20 generations).

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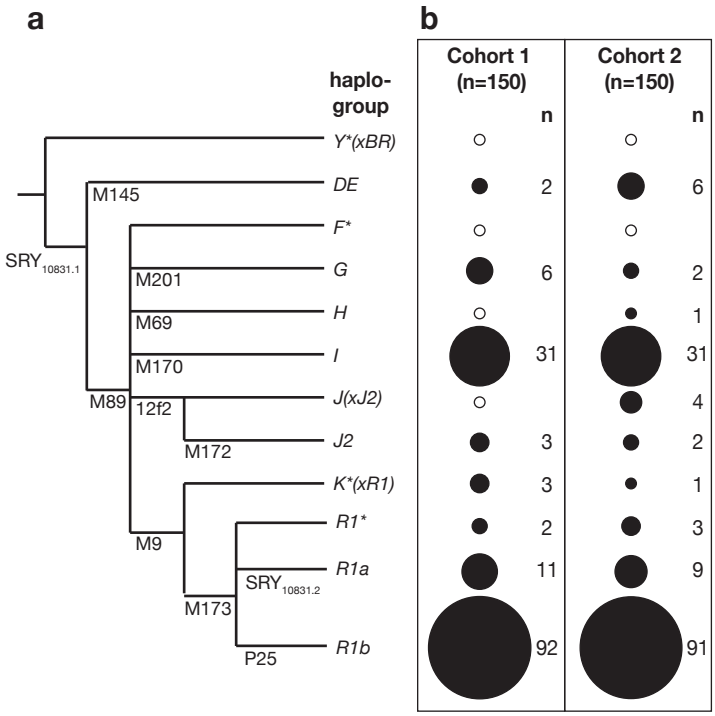
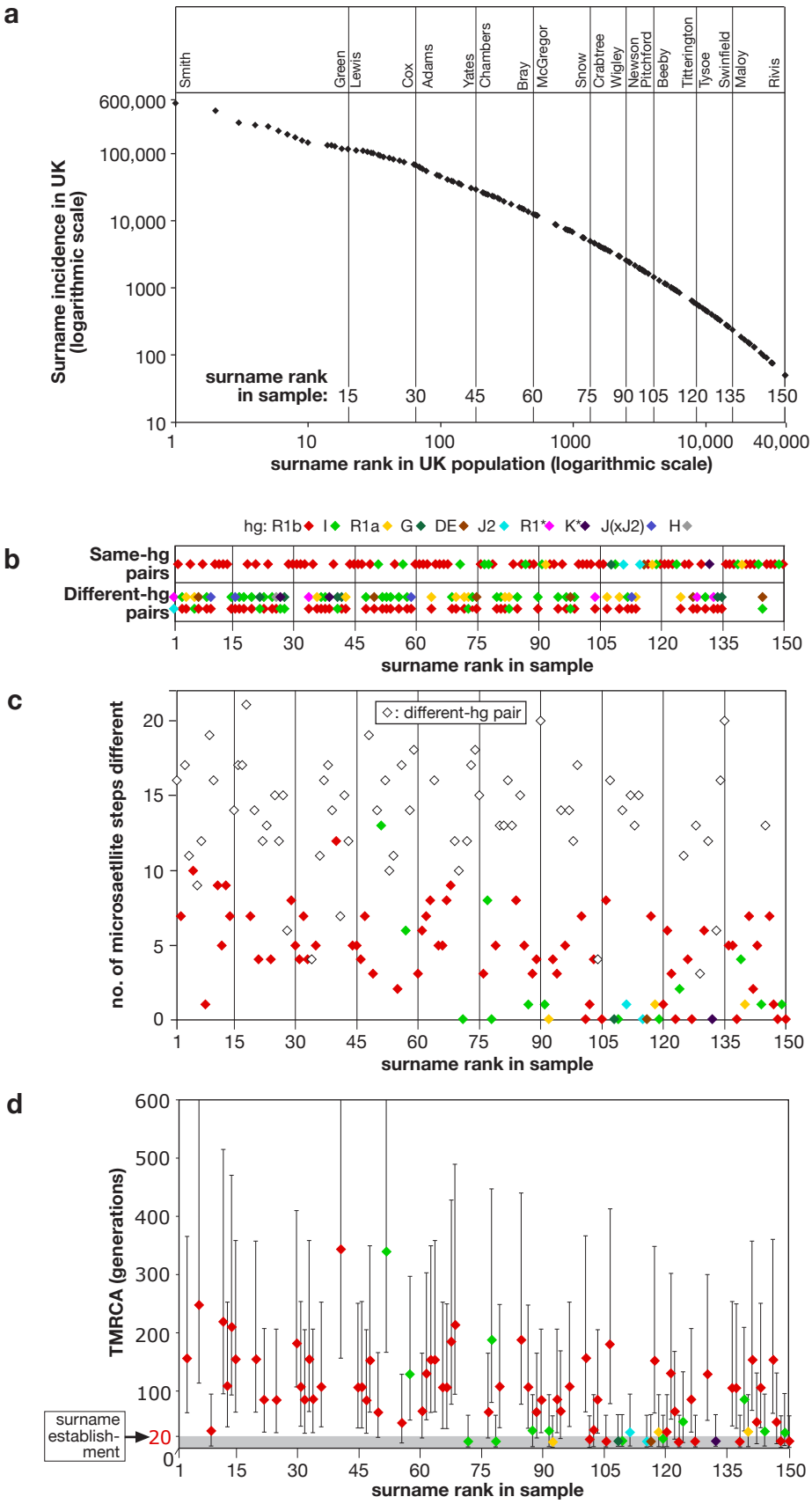


CB-D-05-00754; King et al.; Figure 1



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						microsatellite data																		TMRCA		
Surname	Rank in sample	Incidence 1996	% 1996	Surname	Hg	DYS436	DYS437	DYS438	DYS434	DYS435	DYS439	389I	389II	DYS461	DYS462	DYS460	DYS391	DYS390	DYS393	DYS392	DYS388	DYS19	Hg difft or same	msat steps difft	median	lower bound	upper bound
SMITH	1	560122	1.35156477	Smith	J2	12	15	9	11	11	11	14	17	12	11	10	11	22	12	11	15	14	d	16			
				Smith	R1*	12	15	12	11	11	13	13	17	12	11	11	10	24	13	13	12	14					
JONES	2	431558	1.04134205	Jones	R1b	12	15	11	11	11	12	13	16	12	11	11	13	24	13	13	12	14	s	7	154	63	366
				Jones	R1b	12	15	12	11	11	13	13	16	12	11	11	11	25	13	11	12	14					
WILLIAMS	3	285836	0.68971736	Williams	I	12	16	10	11	11	11	12	16	12	12	11	10	22	13	11	16	14	d	17			
				Williams	R1b	12	15	12	11	11	13	12	17	11	11	12	11	24	13	12	12	14					
BROWN	4	264869	0.63912435	Brown	R1b	12	15	12	11	11	12	13	16	12	11	11	11	23	13	13	12	14	d	11			
				Brown	R1a	12	14	11	11	11	10	13	16	11	11	11	10	25	13	11	12	15					
TAYLOR	5	251567	0.60702685	Taylor	R1b	12	14	12	11	11	13	13	17	12	11	10	11	24	13	13	12	14	s	10	245	110	594
				Taylor	R1b	12	17	12	11	11	11	12	16	12	11	11	11	23	13	14	12	14					
DAVIES	6	216535	0.52249524	Davies	R1a	12	14	11	11	11	10	13	17	11	11	11	10	25	13	11	12	15	d	9			
				Davies	I	12	14	10	11	11	11	14	17	11	12	11	10	23	14	12	13	15					
WILSON	7	192338	0.46410829	Wilson	DE	12	14	10	11	11	12	13	17	13	12	9	10	24	13	11	12	13	d	12			
				Wilson	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14					
EVANS	8	173636	0.41898069	Evans	R1b	12	15	12	11	11	12	13	16	12	11	11	12	24	13	13	12	14	s	1	27	4	95
				Evans	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14					
THOMAS	9	154557	0.37294339	Thomas	R1b	12	15	12	11	11	12	14	16	12	11	11	11	23	13	13	12	14	d	19			
				Thomas	I	12	16	10	11	11	11	12	17	13	12	9	10	22	15	11	14	14					
JOHNSON	10	145459	0.35099007	Johnson	R1b	12	15	12	11	11	12	14	17	12	11	11	11	24	13	13	12	14	d	16			
				Johnson	J	11	14	10	11	11	11	14	16	14	12	11	10	23	12	11	14	14					
THOMPSON	11	132030	0.31858612	Thompson	R1b	14	15	12	11	11	11	13	17	13	11	10	10	23	13	13	12	14	s	9	216	94	516
				Thompson	R1b	12	15	12	11	11	14	13	17	12	11	11	10	24	14	13	12	14					
ROBINSON	12	131532	0.31738446	Robinson	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	13	s	5	104	38	254
				Robinson	R1b	12	15	12	11	11	11	13	14	13	11	11	11	24	13	13	12	14					
WHITE	13	126832	0.30604344	White	R1b	12	15	12	11	11	13	14	16	12	11	11	11	24	13	14	12	14	s	9	207	91	471
				White	R1b	12	14	12	11	11	12	13	16	13	11	10	12	24	13	13	12	16					
EDWARDS	14	116973	0.28225384	Edwards	R1b	12	15	12	11	11	11	13	15	13	11	11	12	24	13	13	12	14	s	7	152	62	356
				Edwards	R1b	12	15	12	11	11	13	14	16	12	11	11	11	24	14	13	12	14					
GREEN	15	116013	0.27993738	Green	R1b	12	14	12	11	11	12	12	17	12	11	11	11	23	13	13	12	14	d	14			
				Green	I	12	16	10	11	11	13	12	17	12	13	10	10	22	13	11	14	14					
LEWIS	16	110710	0.26714133	Lewis	R1b	12	15	12	11	11	11	13	16	12	12	10	12	23	13	13	12	14	d	17			
				Lewis	J	12	15	10	11	11	10	13	18	11	11	10	10	23	12	11	16	15					
JACKSON	17	109428	0.26404789	Jackson	I	12	15	10	11	11	11	12	16	13	12	10	11	26	13	11	13	17	d	17			
				Jackson	R1b	12	15	12	11	11	12	14	15	12	11	11	11	24	13	13	12	14					
TURNER	18	105408	0.25434769	Turner	R1b	12	15	12	14	11	13	13	16	11	11	12	11	24	12	13	12	14	d	21			
				Turner	I	12	16	10	11	11	11	12	16	12	12	10	10	22	13	11	14	14					
HILL	19	102311	0.24687469	Hill	R1b	12	14	12	11	11	12	11	16	12	11	11	10	24	14	13	12	14	s	7	152	62	356
				Hill	R1b	12	15	12	11	11	13	13	16	13	11	11	11	23	14	13	12	14					
MOORE	20	100387	0.24223211	Moore	R1b	12	14	12	11	11	11	13	16	13	11	11	11	23	13	13	12	14	d	14			
				Moore	I	12	15	10	11	11	11	12	17	12	12	11	11	25	13	11	13	16					
WARD	21	95266	0.22987522	Ward	R1b	12	15	12	11	11	11	13	15	12	11	11	10	23	13	13	12	14	s	4	82	27	208
				Ward	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14					
KING	22	92567	0.22336258	King	G	12	16	10	11	11	11	12	17	12	12	10	10	22	14	11	13	15	d	12			

				King	I	12	14	10	11	11	11	13	19	12	12	11	11	23	15	12	13	17					
HARRISON	23	88479	0.21349831	Harrison	R1b	12	14	12	11	11	13	13	16	12	11	11	11	23	13	13	12	14	d	13			
				Harrison	I	12	14	10	11	11	11	14	18	12	12	11	10	23	14	12	13	15					
ALLEN	24	85103	0.20535208	Allen	R1b	12	15	12	11	11	12	14	16	12	11	10	11	24	13	13	12	14	s	4	82	27	208
				Allen	R1b	12	15	12	11	11	12	13	17	12	11	11	10	24	13	13	12	14					
JAMES	25	81415	0.196453	James	R1b	12	15	12	11	11	10	13	18	13	11	10	11	24	13	13	12	14	d	15			
				James	I	12	16	10	11	11	11	12	16	12	12	10	10	23	13	11	14	14					
LEE	26	78083	0.18841294	Lee	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	13	12	14	d	12			
				Lee	H	12	14	9	11	11	11	14	16	12	11	11	10	22	12	11	12	15					
BENNETT	27	74203	0.17905057	Bennett	K-R*	13	14	11	11	11	12	12	17	12	12	10	10	23	14	12	12	13	d	15			
				Bennett	I	12	16	10	11	11	11	13	16	12	13	11	10	23	12	11	14	14					
COLLINS	28	67967	0.1640032	Collins	G	12	16	10	11	11	11	12	18	11	12	11	10	22	14	11	13	15	d	6			
				Collins	I	12	16	10	11	11	11	12	16	12	12	11	10	22	13	11	14	14					
BAILEY	19	66627	0.16076981	Bailey	R1b	12	15	12	11	11	11	13	16	13	11	11	11	24	14	13	12	14	s	8	179	76	411
				Bailey	R1b	12	15	12	11	11	13	13	16	12	11	12	10	23	13	13	12	15					
COX	30	62927	0.15184177	Cox	R1b	12	14	12	11	11	11	13	15	12	11	9	11	22	13	13	12	14	s	5	104	38	254
				Cox	R1b	12	14	12	11	11	12	13	16	12	11	11	11	23	13	13	12	14					
ADAMS	31	61753	0.14900893	Adams	R1b	12	15	12	11	11	12	13	16	12	11	12	10	24	13	13	12	14	s	4	82	27	208
				Adams	R1b	12	15	12	11	11	12	13	16	12	11	11	11	23	13	13	12	15					
ELLIS	32	58395	0.14090613	Ellis	R1b	12	15	13	11	11	11	13	16	12	11	11	10	24	13	13	12	14	s	7	152	62	356
				Ellis	R1b	12	15	12	11	11	13	13	16	13	11	10	11	23	13	13	12	14					
CHAPMAN	33	54880	0.1324245	Chapman	R1b	12	15	12	11	11	11	13	17	12	11	11	11	25	13	14	12	14	s	4	82	27	208
				Chapman	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14					
LLOYD	34	47459	0.11451775	Lloyd	R1b	12	15	12	11	11	11	13	16	12	11	10	11	24	13	13	12	15	d	4			
				Lloyd	R1*	12	15	12	11	11	12	13	16	12	11	9	11	23	13	13	12	14					
JENKINS	35	46633	0.11252463	Jenkins	R1b	12	15	12	11	11	11	13	16	12	11	11	11	23	13	13	12	14	s	5	104	38	254
				Jenkins	R1b	12	15	12	11	11	13	13	17	12	11	12	10	23	13	13	12	14					
BUTLER	36	46096	0.11122886	Butler	R1a	12	14	11	11	11	11	13	17	12	11	10	10	25	13	11	10	16	d	11			
				Butler	R1b	12	14	12	11	11	12	13	17	12	11	10	12	24	13	13	12	14					
REYNOLDS	37	40563	0.09787782	Reynolds	I	12	16	10	11	11	11	12	16	12	13	10	10	23	13	11	14	14	d	16			
				Reynolds	R1b	12	15	12	11	11	12	13	17	13	11	12	10	24	13	13	12	14					
WALSH	38	38788	0.09359478	Walsh	I	12	15	10	11	11	11	12	16	14	12	10	11	25	14	11	13	17	d	17			
				Walsh	R1b	12	15	12	11	11	12	14	16	12	11	11	11	24	13	13	12	14					
DAWSON	39	38218	0.09221938	Dawson	K-R*	12	14	10	10	11	9	14	16	12	12	11	11	23	14	14	12	14	d	14			
				Dawson	R1b	12	15	12	11	11	12	13	16	12	11	11	10	25	13	13	12	14					
SPENCER	40	35830	0.08645717	Spencer	R1b	12	15	13	11	11	11	12	13	11	11	11	11	24	13	13	12	14	s	12	342	153	840
				Spencer	R1b	12	15	12	11	11	14	13	16	12	11	11	11	24	13	14	14	14					
BURTON	41	35428	0.08548716	Burton	G	12	16	10	11	11	11	13	17	13	12	11	10	23	14	11	12	15	d	7			
				Burton	I	12	16	10	11	11	11	13	17	12	12	10	10	22	13	11	14	14					
ROSE	42	34372	0.08293905	Rose	R1b	12	15	12	11	11	11	12	16	12	11	12	10	24	13	13	12	15	d	15			
				Rose	G	12	16	10	11	11	11	12	17	11	13	10	10	22	14	11	13	15					
OLIVER	43	30381	0.07330883	Oliver	R1a	12	14	11	11	11	10	13	17	11	11	11	10	25	13	11	12	16	d	12			
				Oliver	R1b	12	15	12	11	11	12	13	18	12	11	11	11	24	13	13	12	14					
HARDING	44	29048	0.07009233	Harding	R1b	12	15	12	11	11	12	13	17	13	11	11	11	25	13	13	12	14	s	5	103	37	250
				Harding	R1b	12	15	12	11	11	11	13	16	12	11	11	12	24	13	13	12	14					
YATES	45	26108	0.06299816	Yates	R1b	12	15	12	11	11	12	13	16	13	11	11	12	23	13	13	12	14	s	5	104	38	254
				Yates	R1b	12	15	12	11	11	12	13	17	12	11	11	10	24	13	13	12	14					

CHAMBERS	46	25752	0.06213913	Chambers	R1b	12	15	12	11	11	12	13	16	11	11	11	11	25	13	13	12	14	s	4	82	27	208
				Chambers	R1b	12	15	12	11	11	11	13	16	12	11	11	10	24	13	13	12	14					
CAMERON	47	25003	0.06033181	Cameron	R1b	12	15	12	11	11	12	13	16	12	11	11	12	24	13	13	12	15	s	7	151	62	347
				Cameron	R1b	12	15	12	11	11	11	13	15	12	11	10	11	25	13	14	12	14					
OSBORNE	48	24327	0.05870063	Osborne	R1b	12	15	13	12	11	14	13	16	13	11	11	10	25	13	13	12	14	d	19			
				Osborne	I	12	16	10	11	11	12	12	16	12	12	10	10	22	13	11	14	15					
LAWSON	49	23306	0.05623698	Lawson	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14	s	3	62	18	168
				Lawson	R1b	12	15	12	11	11	13	14	16	13	11	11	11	24	13	13	12	14					
ARNOLD	50	22686	0.05474093	Arnold	R1b	12	15	13	11	11	12	13	16	12	11	11	10	25	13	13	12	14	d	14			
				Arnold	DE	12	14	10	10	11	13	13	17	12	12	9	10	24	13	11	12	13					
LAMBERT	51	21560	0.05202391	Lambert	I	12	15	10	11	11	11	12	18	12	12	10	11	25	13	11	13	16	s	17	337	161	749
				Lambert	I	12	14	10	11	11	11	13	17	13	12	11	10	23	14	12	12	14					
CLAYTON	52	20841	0.05028898	Clayton	I	12	16	10	11	11	11	12	16	11	13	10	10	23	13	11	14	14	d	16			
				Clayton	R1b	11	15	12	11	11	12	13	17	12	11	10	11	24	13	13	12	14					
KIRK	53	19344	0.04667674	Kirk	I	12	16	10	11	11	11	12	16	12	13	11	10	23	13	11	14	14	d	10			
				Kirk	R1b	12	15	11	11	11	11	13	16	12	11	11	10	24	13	13	12	14					
GLOVER	54	17460	0.04213068	Glover	I	12	15	10	11	11	12	13	16	11	12	10	11	24	13	11	13	15	d	11			
				Glover	R1b	12	15	12	11	11	12	13	17	12	11	11	10	24	13	13	12	14					
COATES	55	15695	0.03787177	Coates	R1b	12	15	12	11	11	12	13	16	12	11	12	11	24	13	13	12	14	s	2	44	10	130
				Coates	R1b	12	15	12	11	11	11	13	16	12	11	11	11	24	13	13	12	14					
GARDINER	56	15279	0.03686796	Gardiner	I	12	16	10	11	11	11	12	16	13	12	10	10	22	13	11	14	14	d	17			
				Gardiner	R1b	12	14	12	11	11	12	13	14	13	11	11	11	24	13	13	12	14					
HOUGHTON	57	14675	0.03541052	Houghton	I	12	16	10	11	11	12	12	16	12	12	10	10	22	13	11	14	14	s	6	126	49	296
				Houghton	I	12	16	10	11	11	11	12	17	12	13	10	10	23	14	11	15	14					
DENNIS	58	13488	0.03254631	Dennis	R1b	12	15	12	11	11	10	13	17	12	11	10	11	24	13	13	12	14	d	14			
				Dennis	I	12	16	11	11	11	12	12	16	12	13	10	10	23	13	11	14	14					
BLAIR	59	12473	0.03009713	Blair	R1b	12	15	12	11	11	11	13	16	11	11	12	11	26	13	13	12	14	d	18			
				Blair	J	12	14	10	11	11	12	13	14	11	11	11	10	23	12	11	16	14					
BRAY	60	12195	0.02942633	Bray	R1b	12	15	12	11	11	12	14	16	12	11	11	11	24	13	13	12	14	s	3	62	18	168
				Bray	R1b	12	15	12	11	11	11	13	16	12	11	11	11	23	13	13	12	14					
MCGREGOR	61	12072	0.02912953	McGregor	R1b	12	15	12	11	11	13	13	16	14	11	11	11	23	13	13	12	14	s	6	128	49	302
				McGregor	R1b	12	15	12	12	11	13	13	16	12	11	12	10	24	13	13	12	14					
FRY	62	11863	0.02862522	Fry	R1b	12	15	13	11	11	12	14	16	12	11	10	11	23	13	13	12	14	s	7	151	62	347
				Fry	R1b	12	15	12	11	11	11	13	16	13	11	11	10	23	13	14	12	14					
HUMPHRIES	63	11852	0.02859867	Humphries	R1b	12	15	12	11	11	11	13	15	11	11	10	10	23	13	13	12	14	s	8	152	62	356
				Humphries	R1b	12	15	12	11	11	13	13	16	12	11	11	11	24	13	13	13	14					
HODGE	64	8795	0.02122218	Hodge	R1b	12	15	9	11	11	13	13	16	12	11	11	10	24	13	13	12	15	d	16			
				Hodge	R1a	12	14	11	11	11	10	14	18	12	12	12	10	25	13	11	10	15					
LOVELL	65	8601	0.02075407	Lovell	R1b	12	15	12	11	11	13	13	16	12	11	11	11	24	13	14	14	14	s	5	104	38	254
				Lovell	R1b	12	15	12	11	11	12	13	17	12	11	11	11	24	13	13	12	14					
LYON	66	7485	0.01806118	Lyon	R1b	12	14	12	11	11	13	13	16	12	11	11	11	24	13	13	13	14	s	5	103	37	250
				Lyon	R1b	12	15	12	11	11	12	13	16	12	11	11	11	25	13	14	12	14					
BARRON	67	7314	0.01764856	Barron	R1b	12	15	12	11	11	12	13	17	14	11	11	10	25	13	13	12	14	s	8	182	77	425
				Barron	R1b	12	14	12	11	11	12	14	16	12	11	11	11	23	13	13	12	14					
RANKIN	68	7207	0.01739037	Rankin	R1b	12	15	12	11	11	12	13	16	13	11	12	10	24	13	14	12	14	s	9	211	92	488
				Rankin	R1b	12	15	10	11	11	11	12	16	13	12	10	11	24	13	13	12	14					
STEAD	69	7066	0.01705014	Stead	R1b	12	15	12	11	11	12	13	16	13	11	11	10	26	13	13	12	14	d	12			
				Stead	I	12	15	10	11	11	12	13	16	12	12	11	10	23	14	12	13	16					

GOLDSMITH	70	6790	0.01638415	Goldsmith	R1a	12	14	11	11	11	10	13	18	11	11	12	11	25	13	11	10	17	d	10			
				Goldsmith	R1b	12	16	12	11	11	11	13	18	11	11	12	11	25	13	13	12	15					
MAJOR	71	5608	0.01353201	Major	I	12	15	10	11	11	10	12	19	12	12	11	10	23	15	12	14	16	s	0	11	0.4	60
				Major	I	12	15	10	11	11	10	12	19	12	12	11	10	23	15	12	14	16					
NEILL	72	5525	0.01333173	Neill	R1a	12	14	11	11	11	10	14	18	11	11	12	11	25	13	11	12	16	d	12			
				Neill	R1b	12	15	12	11	11	11	13	17	12	11	11	11	24	13	13	12	14					
HAGUE	73	5478	0.01321832	Hague	I	12	16	10	11	11	12	12	17	12	12	10	10	22	13	11	14	14	d	17			
				Hague	R1a	12	14	11	11	11	10	13	17	12	11	11	11	25	13	11	12	17					
SHEARER	74	4962	0.01197322	Shearer	I	12	16	10	11	11	11	12	17	11	13	9	10	23	13	11	14	14	d	18			
				Shearer	R1b	12	15	12	11	12	12	13	16	13	11	10	11	24	13	13	12	14					
SNOW	75	4592	0.01108042	Snow	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14	d	15			
				Snow	DE	12	14	11	11	11	12	13	18	13	12	10	10	21	14	11	12	15					
CRABTREE	76	4576	0.01104181	Crabtree	R1b	12	15	12	11	11	10	14	16	12	11	13	11	24	13	13	12	14	s	3	62	18	168
				Crabtree	R1b	12	15	12	11	11	11	14	16	12	11	12	12	24	13	13	12	14					
BUTTERFIELD	77	4251	0.01025759	Butterfield	I	12	14	10	11	11	11	12	17	12	12	11	10	23	14	13	13	15	s	8	186	78	445
				Butterfield	I	12	14	10	11	11	11	14	17	12	12	10	10	20	14	12	12	15					
JEFFERSON	78	4179	0.01008386	Jefferson	I	12	15	10	11	11	12	12	17	12	12	9	11	23	13	11	13	16	s	0	11	0.4	60
				Jefferson	I	12	15	10	11	11	12	12	17	12	12	9	11	23	13	11	13	16					
WADSWORTH	79	4059	0.0097943	Wadsworth	R1b	12	15	12	11	11	12	13	17	11	11	11	10	24	13	13	12	15	s	5	103	37	250
				Wadsworth	R1b	12	15	12	11	11	13	13	16	12	11	11	11	24	13	13	12	14					
PICKETT	80	3909	0.00943235	Pickett	I	12	15	10	11	11	13	13	15	11	12	11	10	22	13	11	13	16	d	13			
				Pickett	R1b	12	15	12	11	11	11	13	15	12	11	11	11	23	13	13	12	14					
BRYSON	81	3836	0.0092562	Bryson	R1b	12	15	12	11	11	12	13	16	12	11	11	11	23	13	13	12	14	d	13			
				Bryson	I	12	16	11	11	11	11	12	19	12	12	11	10	23	13	11	14	14					
WORTH	82	3818	0.00921277	Worth	R1b	12	15	12	11	11	12	14	16	12	11	11	11	23	13	13	13	15	d	16			
				Worth	R1a	12	14	11	11	11	10	13	18	11	11	12	10	24	13	11	10	15					
POULTON	83	3781	0.00912349	Poulton	R1a	12	14	11	11	11	11	13	17	12	11	11	10	24	13	11	10	15	d	13			
				Poulton	I	12	16	10	11	11	11	12	16	12	12	10	11	23	13	11	14	15					
STEADMAN	84	3581	0.00864089	Steadman	R1b	12	15	12	11	11	13	14	16	12	11	10	11	25	13	13	10	14	s	8	185	78	440
				Steadman	R1b	12	15	12	11	11	11	12	16	12	11	11	11	24	13	13	12	14					
PITTS	85	3472	0.00837788	Pitts	I	12	14	10	11	11	11	14	19	12	12	12	10	23	15	13	13	15	d	15			
				Pitts	R1b	12	15	12	11	11	11	12	16	12	11	11	11	24	13	13	12	15					
ROSSER	86	2967	0.00715932	Rosser	R1b	12	15	12	11	11	12	13	16	12	11	11	10	23	13	14	12	14	s	5	103	37	250
				Rosser	R1b	12	15	12	12	11	11	13	16	12	11	11	11	24	13	13	12	14					
MALLINSON	87	2965	0.00715449	Mallinson	I	12	16	10	11	11	11	12	17	12	12	11	10	22	13	11	14	14	s	1	27	4	95
				Mallinson	I	12	16	10	11	11	11	12	17	12	12	11	10	23	13	11	14	14					
TRUEMAN	88	2924	0.00705556	Trueman	R1b	12	15	12	11	11	12	13	16	12	11	10	11	23	13	13	12	14	s	3	62	18	168
				Trueman	R1b	12	15	12	11	11	11	13	16	12	11	11	11	24	13	13	12	14					
TEAGUE	89	2901	0.00700006	Teague	R1b	12	15	12	11	11	11	13	17	12	11	10	10	25	13	14	12	14	s	4	82	27	208
				Teague	R1b	12	15	12	11	11	11	13	16	12	11	11	10	24	13	13	12	14					
WIGLEY	90	2570	0.00620137	Wigley	R1b	12	15	12	11	11	12	13	16	12	11	10	11	25	13	13	12	14	d	20			
				Wigley	I	12	16	10	11	11	8	12	16	12	12	11	10	22	13	11	16	14					
NEWSON	91	2426	0.0058539	Newson	I	12	16	11	11	11	11	12	16	12	13	10	10	23	13	11	14	14	s	1	27	4	95
				Newson	I	12	16	10	11	11	11	12	16	12	13	10	10	23	13	11	14	14					
WIDDOWSON	92	2376	0.00573325	Widdowson	R1a	12	14	11	11	11	10	13	17	11	11	11	11	25	13	11	12	15	s	0	11	0.4	60
				Widdowson	R1a	12	14	11	11	11	10	13	17	11	11	11	11	25	13	11	12	15					
WILLCOX	93	2363	0.00570188	Willcox	R1b	12	14	12	11	11	12	13	16	13	11	11	11	23	13	13	12	14	s	4	82	27	208

				Willcox	R1b	12	15	12	11	11	12	13	16	12	11	10	11	24	13	13	12	14					
PASSMORE	94	2139	0.00516137	Passmore	R1b	12	15	12	11	11	12	13	16	12	11	11	11	22	13	13	12	14	s	3	63	18	169
				Passmore	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	13	12	14					
JOBLING	95	1944	0.00469084	Jobling	I	12	16	10	11	11	11	12	18	12	13	10	10	23	13	11	12	15	d	14			
				Jobling	R1b	12	15	12	11	11	12	14	17	12	11	11	10	24	13	13	12	14					
JEFFREYS	96	1941	0.0046836	Jeffreys	R1b	12	15	12	11	11	11	13	16	12	11	10	11	24	13	13	12	14	s	5	104	38	254
				Jeffreys	R1b	12	14	12	11	11	11	14	16	12	11	9	11	26	13	13	12	14					
LAUDER	97	1931	0.00465947	Lauder	I	12	16	10	11	11	11	12	16	12	12	11	10	22	13	11	14	14	d	14			
				Lauder	R1b	12	15	12	11	11	13	13	16	11	11	11	10	24	13	13	12	14					
HEY	98	1854	0.00447367	Hey	I	12	16	11	11	11	12	12	16	12	13	10	10	23	13	11	14	14	d	12			
				Hey	DE	12	14	10	11	11	12	13	18	12	12	9	10	24	13	11	12	13					
HUGGETT	99	1835	0.00442782	Huggett	R1b	12	15	12	11	11	12	13	16	12	11	10	10	24	13	13	12	15	d	17			
				Huggett	I	12	16	10	11	11	14	14	16	13	12	11	11	23	14	11	9	15					
CHUBB	100	1793	0.00432648	Chubb	R1b	12	15	12	11	11	12	12	16	12	11	11	11	24	13	15	12	14	s	7	154	63	366
				Chubb	R1b	12	15	12	11	11	11	13	16	12	11	11	11	26	13	13	12	15					
JEWITT	101	1755	0.00423478	Jewitt	R1b	12	14	12	11	11	12	13	17	12	11	11	11	24	13	13	12	14	s	0	11	0.4	60
				Jewitt	R1b	12	14	12	11	11	12	13	17	12	11	11	11	24	13	13	12	14					
PETTIGREW	102	1746	0.00421307	Pettigrew	R1b	12	15	12	11	11	13	13	15	11	11	11	11	24	13	14	12	14	s	1	27	4	95
				Pettigrew	R1b	12	15	12	11	11	13	13	15	11	11	10	11	24	13	14	12	14					
RAVENSCROFT	103	1728	0.00416963	Ravenscroft	R1b	12	15	11	11	11	12	13	16	12	11	11	11	24	13	13	12	14	s	4	82	27	208
				Ravenscroft	R1b	12	15	12	11	11	11	13	16	12	11	11	10	24	13	13	12	15					
HOOLEY	104	1614	0.00389455	Hooley	R1*	12	14	12	11	11	11	14	16	12	11	11	12	24	13	13	12	14	d	4			
				Hooley	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	13	13	12	14					
PITCHFORD	105	1441	0.00347711	Pitchford	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	14	13	12	14	s	0	11	0.4	60
				Pitchford	R1b	12	15	12	11	11	12	13	16	12	11	11	11	24	14	13	12	14					
BEEBY	106	1288	0.00310792	Beeby	R1b	12	14	12	11	11	12	13	17	12	11	10	11	24	13	14	12	16	s	8	179	76	411
				Beeby	R1b	12	15	12	11	11	11	14	16	12	11	11	11	24	13	13	12	14					
BOWRING	107	1158	0.00279423	Bowring	R1b	12	14	13	11	11	13	13	16	11	11	11	10	24	13	13	12	14	d	16			
				Bowring	R1a	12	14	11	11	11	10	13	19	11	11	13	10	25	13	11	10	15					
PERROTT	108	1151	0.00277734	Perrott	G	12	16	10	11	11	10	12	17	11	12	10	10	22	14	11	13	15	s	0	11	0.4	60
				Perrott	G	12	16	10	11	11	10	12	17	11	12	10	10	22	14	11	13	15					
WETTON	109	1107	0.00267117	Wetton	I	12	14	10	12	11	11	14	16	12	12	10	10	23	13	11	15	15	s	0	11	0.4	60
				Wetton	I	12	14	10	12	11	11	14	16	12	12	10	10	23	13	11	15	15					
STARBUCK	110	1008	0.00243229	Starbuck	R1b	12	15	12	10	11	12	12	16	12	11	10	12	25	13	13	12	14	d	14			
				Starbuck	R1a	12	14	11	11	11	11	13	16	11	11	11	10	26	13	11	12	16					
DUNCOMBE	111	1005	0.00242505	Duncombe	J2	12	15	9	11	11	12	13	18	12	11	11	11	24	12	11	14	15	s	1	27	4	95
				Duncombe	J2	12	15	9	11	11	12	13	17	12	11	11	11	24	12	11	14	15					
GRACEY	112	967	0.00233335	Gracey	I	12	16	10	11	11	11	13	17	12	12	11	10	22	13	11	14	14	d	15			
				Gracey	R1b	12	15	12	11	11	12	13	16	12	11	12	10	25	13	14	12	14					
WINSTON	113	941	0.00227062	Winston	R1b	12	15	12	11	11	12	13	16	12	11	11	11	23	13	13	12	14	d	13			
				Winston	J	12	14	10	11	11	12	13	17	11	11	11	10	23	12	11	16	14					
SLINGSBY	114	909	0.0021934	Slingsby	R1a	12	14	11	11	11	10	14	17	11	11	10	11	25	13	11	12	16	d	15			
				Slingsby	R1b	12	15	12	11	11	12	13	16	12	11	12	10	24	13	13	12	14					
KETLEY	115	886	0.0021379	Ketley	J2	12	14	9	11	11	12	13	16	13	10	10	9	24	12	11	16	16	s	0	11	0.4	60
				Ketley	J2	12	14	9	11	11	12	13	16	13	10	10	9	24	12	11	16	16					
ATTENBOROUGH	116	839	0.00202449	Attenborough	DE	12	14	10	11	11	12	13	17	12	12	9	10	23	13	11	12	13	s	0	11	0.4	60
				Attenborough	DE	12	14	10	11	11	12	13	17	12	12	9	10	23	13	11	12	13					
NORTHAM	117	638	0.00153948	Northam	R1b	12	14	12	11	11	13	13	16	13	11	12	11	24	13	13	12	14	s	7	151	62	347

				Northam	R1b	12	15	12	11	11	12	13	15	12	11	11	11	23	13	13	12	15					
SWINDLEHURST	118	618	0.00149122	Swindlehurst	R1a	12	14	11	11	11	10	12	17	11	11	10	11	25	13	11	12	15	s	1	27	4	95
				Swindlehurst	R1a	12	14	11	11	11	10	13	17	11	11	10	11	25	13	11	12	15					
HERRICK	119	601	0.0014502	Herrick	I	12	16	10	11	11	12	12	17	13	13	10	10	23	13	11	14	14	s	0	11	0.4	60
				Herrick	I	12	16	10	11	11	12	12	17	13	13	10	10	23	13	11	14	14					
TITTERINGTON	120	568	0.00137057	Titterington	R1b	12	14	12	11	11	12	13	16	12	12	10	12	24	13	13	12	14	s	1	27	4	95
				Titterington	R1b	12	14	12	11	11	12	13	17	12	12	10	12	24	13	13	12	14					
TYSOE	121	535	0.00129095	Tysoe	R1b	12	15	12	11	11	11	14	17	12	11	11	11	25	13	14	12	14	s	6	128	49	302
				Tysoe	R1b	12	15	12	11	11	11	12	16	12	12	11	11	24	13	13	12	14					
TIFFANY	122	530	0.00127888	Tiffany	R1b	12	14	12	11	11	12	13	16	12	11	10	11	24	13	13	12	14	s	3	62	18	168
				Tiffany	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	13	12	14					
GREWCOCK	123	493	0.0011896	Grewcock	R1b	12	14	12	11	11	13	13	16	12	11	10	11	24	14	13	12	13	s	0	11	0.4	60
				Grewcock	R1b	12	14	12	11	11	13	13	16	12	11	10	11	24	14	13	12	13					
TITMUS	124	467	0.00112686	Titmus	I	12	16	10	11	11	11	12	16	13	12	10	10	22	14	11	14	14	s	2	44	10	130
				Titmus	I	12	16	10	11	11	11	12	17	12	12	10	10	22	14	11	14	14					
DUBOIS	125	458	0.00110515	Dubois	R1a	12	14	11	11	11	11	13	17	11	11	11	10	25	13	11	12	16	d	11			
				Dubois	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	14	12	14					
BECKHAM	126	441	0.00106413	Beckham	R1b	12	15	12	11	11	12	13	16	12	11	11	10	25	13	13	12	14	s	4	83	27	210
				Beckham	R1b	12	15	12	11	11	12	13	16	13	11	10	10	23	13	13	12	14					
DALGLIESH	127	402	0.00097002	Dalgliesh	R1b	12	15	12	11	11	12	13	17	12	11	11	11	24	13	13	14	15	s	0	11	0.4	60
				Dalgliesh	R1b	12	15	12	11	11	12	13	17	12	11	11	11	24	13	13	14	15					
MARFLEET	128	366	0.00088315	Marfleet	R1b	12	16	11	11	11	12	14	16	12	11	10	11	24	13	13	12	14	d	13			
				Marfleet	DE	12	15	10	11	11	12	13	17	13	12	9	10	24	13	11	14	13					
TREHERNE	129	350	0.00084454	Treherne	R1*	12	15	12	11	11	12	13	16	12	11	10	12	25	13	13	12	14	d	3			
				Treherne	R1b	12	15	12	11	11	12	14	16	12	11	11	11	25	13	13	12	14					
TITCHMARSH	130	349	0.00084213	Titchmarsh	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	13	12	14	s	6	126	49	296
				Titchmarsh	R1b	12	15	12	11	11	11	13	15	12	11	11	11	25	12	13	12	15					
FIANDER	131	325	0.00078422	Fiander	I	12	16	10	11	11	11	12	16	12	13	11	10	23	13	11	14	14	d	12			
				Fiander	R1b	12	15	12	11	11	12	13	16	12	11	11	10	24	13	13	12	14					
FEAKES	132	278	0.00067081	Feakes	K-R*	12	14	9	11	11	11	14	16	11	12	10	10	22	13	13	12	13	s	0	11	0.4	60
				Feakes	K-R*	12	14	9	11	11	11	14	16	11	12	10	10	22	13	13	12	13					
BOLINGBROKE	133	272	0.0006565	Bolingbroke	R1b	12	14	13	11	11	11	14	16	12	11	11	10	24	13	13	13	14	d	6			
				Bolingbroke	R1*	12	16	12	11	11	11	13	16	12	11	11	11	24	13	13	12	14					
CLAIR	134	262	0.0006322	Clair	G	12	16	10	11	11	12	12	17	11	12	10	10	21	13	11	12	15	d	16			
				Clair	R1b	12	15	12	11	11	12	13	16	12	11	11	11	25	13	14	12	14					
SWINFIELD	135	236	0.00056946	Swinfield	G	12	16	10	11	11	11	12	17	11	12	11	10	22	14	11	15	16	d	20			
				Swinfield	R1b	12	15	12	11	11	11	14	16	12	11	11	11	24	13	14	12	14					
MALOY	136	186	0.00044881	Maloy	R1b	12	15	12	11	11	12	13	16	12	11	12	11	24	13	14	12	14	s	5	104	38	254
				Maloy	R1b	12	15	12	11	11	13	13	16	12	11	10	11	24	12	13	12	14					
GILLER	137	169	0.00040779	Giller	R1b	12	15	12	11	11	11	12	16	12	11	11	10	24	12	14	12	14	s	5	103	37	250
				Giller	R1b	12	15	12	11	11	11	13	17	12	11	11	11	24	13	13	12	14					
HAWTHORNTHWAITE	138	153	0.00036919	Hawthornthwa	R1b	12	15	12	11	11	10	13	16	12	11	11	11	24	13	13	12	15	s	0	11	0.4	60
				Hawthornthwa	R1b	12	15	12	11	11	10	13	16	12	11	11	11	24	13	13	12	15					
WOMBELL	139	148	0.00035712	Wombell	I	12	16	10	11	11	11	12	17	12	12	10	10	22	13	11	14	14	s	4	83	27	210
				Wombell	I	12	16	10	11	11	11	12	16	12	12	11	10	22	13	11	14	16					
SACKER	140	147	0.00035471	Sacker	R1a	12	14	11	11	11	10	13	16	11	11	12	11	25	13	11	12	15	s	1	27	4	95
				Sacker	R1a	12	14	11	11	11	10	13	16	11	11	11	11	25	13	11	12	15					

RUDGLEY	141	131	0.0003161	Rudgley	R1b	12	15	13	11	11	13	13	17	12	11	11	10	24	13	13	12	14	s	7	152	62	356
				Rudgley	R1b	12	15	12	11	11	12	14	16	14	11	11	10	23	13	13	12	14					
WHERRETT	142	130	0.00031369	Wherrett	R1b	12	15	12	11	11	11	13	14	12	11	11	11	23	13	13	12	14	s	2	44	10	131
				Wherrett	R1b	12	15	12	11	11	11	13	16	12	11	11	11	23	13	13	12	14					
HURLES	143	106	0.00025578	Hurles	R1b	12	14	13	11	11	11	13	16	12	11	11	11	24	13	13	12	14	s	5	103	37	250
				Hurles	R1b	12	15	12	11	11	12	13	16	12	11	11	11	25	13	14	12	14					
ADKINSON	144	97	0.00023406	Adkinson	I	12	15	10	11	11	11	12	18	13	12	10	10	24	13	11	13	17	s	1	27	4	95
				Adkinson	I	12	15	10	11	11	11	12	18	13	12	10	10	24	13	11	12	17					
SLYNN	145	90	0.0002172	Slynn	I	12	15	10	11	11	10	12	17	12	12	11	10	23	15	12	13	15	d	13			
				Slynn	DE	12	14	10	11	11	10	12	17	12	12	10	11	25	13	11	12	11					
HAYTHORN	146	77	0.0001858	Haythorn	R1b	12	15	12	11	12	12	14	16	12	11	12	10	24	13	13	12	14	s	7	152	62	356
				Haythorn	R1b	12	15	12	11	11	10	13	16	11	11	11	11	24	13	13	12	14					
BADGE	147	76	0.00018339	Badge	R1b	12	15	12	11	11	12	13	16	12	11	11	12	24	13	13	12	14	s	1	44	10	130
				Badge	R1b	12	15	12	11	11	11	13	16	12	11	11	11	24	13	13	12	14					
STRIBBLING	148	75	0.00018097	Stribbling	R1b	12	15	12	11	11	12	13	16	13	12	11	10	23	13	14	12	14	s	0	11	0.4	60
				Stribbling	R1b	12	15	12	11	11	12	13	16	13	12	11	10	23	13	14	12	14					
FEAKIN	149	50	0.00012065	Feakin	I	12	16	10	11	11	11	12	16	11	13	10	10	23	13	11	15	14	s	1	27	4	95
				Feakin	I	12	16	10	11	11	11	12	16	11	13	10	10	23	13	11	14	14					
RIVIS	150	50	0.00012065	Rivis	R1b	12	15	12	11	11	12	13	16	13	11	11	10	24	13	13	12	14	s	0	11	0.4	60
				Rivis	R1b	12	15	12	11	11	12	13	16	13	11	11	10	24	13	13	12	14					