Appendices

A How Merit evolved

B Measuring Happiness: An Example

Appendix A. How Merit Evolved

Contents:

Before 'merit' - traditional methods of selection

A major move towards 'merit'-Open competitive examinations

'The Rise of the Meritocracy' Michael Young's warning on IQ testing

How tests of ability work: Two examples

- 1. The 11+:School selection using an intelligence test
- 2. Scholastic Aptitude Tests (SATs) in the US

Personality testing:

Before 'merit' - traditional methods of selection

In the past those with power and possession were able to exercise both patronage and nepotism. Some elements of patronage persist to this day: The appointment of some incumbent vicars in the Church of England is in the gift of the local landowner. Appointing members of your extended family is a traditional way that immigrant communities thrive, safe in the knowledge that they should be able to trust their relatives. Of course the counterpart to this form of insider appointment is that the applicant must curry favour with those bestowing gifts.

Inheritance, particularly through primogeniture has been the basis for handing down kingships, titles and the landed estates that go with them. This was based on an instinctive belief in the hereditability of the exceptional talent. It was Francis Galton in his tract on 'Hereditable Genius' (1869) who invented the pseudo-science of Eugenics. By showing that the sons of Lord Chancellors of England were also high achievers seemed to support his case, but later scholars spotted the flaws in his argument.

Strict seniority, awarding the next job or promotion to the oldest eligible candidate has been used in institutions such as monasteries and amongst airline pilots. In the case of monasteries, appointments are based on time elapsed since ordination. For airline pilots, promotion to captain by length of service has a certain logic: All pilots must be competent to fly aeroplanes; regular testing ensures this. It would invidious to suggest that some were better than others, and hence more worthy of promotion. This would imply that the non-promoted, were somehow less competent, yet could still be trusted to take control.

Elections are widely used as part of the democratic process, and can sometimes be found in organisational allocation. Clubs, political parties, even orchestras *elect* their leaders (The Berlin Philharmonic is one example). Honda allowed the workers in a section to elect their section leader.

A major move towards 'merit'-Open competitive examinations

In a move away from the patronage-based appointment systems that went before, the British Civil Service and the Indian Office adopted a novel approach: Selection based solely on the results of examinations which were, in theory, open to anyone. This is Parkinson's (1958) (of 'Parkinson's Law' fame) delightful description of how the system arose:

'The Chinese system was studied by Europeans between 1815 and 1830 and adopted by the East India Company in 1832. The effectiveness of this method was investigated by a committee in 1854, with Macaulay as chairman. The result was that the system of competitive examination was introduced into the Civil Service in 1855. An essential feature of the Chinese examinations had been their literary character. The test was in a knowledge of the classics, in an ability to write elegantly (both prose and verse) and in the stamina necessary to complete the course. All these features were faithfully incorporated in the Trevelyan-Northcote Report, and thereafter in the system it did so much to create. It was assumed that classical learning and literary ability would fit any candidate for any administrative post. It was assumed (no doubt rightly) that a scientific education would fit a candidate for nothing— except, possibly, science. It was known, finally, that it is virtually impossible to find an order of merit among people who have been examined in different subjects. Since it is impracticable to decide whether one man is better in geology than another man in physics, it is at least convenient to be able to rule them both out as useless. When all candidates alike have to write Greek or Latin verse, it is relatively easy to decide which verse is the best. Men thus selected on their classical performance were then sent forth to govern India. Those with lower marks were retained to govern England. Those with still lower marks were rejected altogether or sent to the colonies.'

Parkinson concludes that

'Selection by competitive examination was never therefore more than a moderate success.

but adds sardonically that

'Whatever the faults, however, of the competitive written examination, it certainly produced better results than any method that has been attempted since.'

Open competitive examinations are little used currently, but at least they make the point: That it is possible to allocate benefices based on some form of objective measured merit rather than the corrupt and wasteful systems that went before. The search was now on to find better, more rational methods of selection.

'The Rise of the Meritocracy' Michael Young's warning on IQ testing

Meritocracy is usually employed in the sense of a social system which allows people to achieve success proportionate to their talents and abilities, as opposed to one in which social class or wealth is the controlling factor. But the original coiner of the word meritocracy had a different idea—not an egalitarian utopia, but something far less attractive. As the twentieth century developed, and more advanced technologies were transforming the lives of ordinary people, it was reasonable to ask: What if the testing of people could become as predictable and accurate as say launching a Sputnik? This was the idea developed by Michael Young, who was a highly respected British sociologist. It was his 1958 satire, *The Rise of the Meritocracy 1870-2033*, which offered a prescient critique of how ever-more reliable IQ measurement would create a dangerously smug

ruling class and a demoralised lower class. The book, which was highly influential in its time, is a mixture of known facts, and intelligent speculation about the future.

In Young's famous formulation (p74)

M can be defined as M = I + E

where **I** is IQ—intelligence quotient, as measured by an IQ test, and **E** is Effort, as measured by 'scientific management'.

To make sure that no-one was in any doubt about the importance of IQ, Young listed what was known about IQ and performance (p157):' High scores on IQ tests was correlated with high performance at Grammar School, University and Life. It was also an indicator of many abilities: verbal, numerical, spatial, perceptual, memory, cardriving, digital dexterity, analogising power, mechanical aptitude, clerical aptitude, emotional maturity, sexual attraction, taste sensitivity, accuracy, persistency, powers of observation.'

Young imagined that the testing of IQ would become more precise, and that the abilities listed above would be closely correlated with performance. On the measurement of effort Young was less sure-footed: He referred to the well-known pioneer of scientific management, F W Taylor, whose name is associated with the time-and-motion study movement, which did much to improve the efficiency of both factories and offices.

As a consequence, the cleverer workers would be sorted out into the top jobs, where they would meet like-minded people, marry them and have a new generation of superintelligent offspring. In this way a new aristocracy of merit would arise, which in time would declare itself permanent. It hardly need be added that Young's meritocratic dystopia has not happened. It is worth examining why:

IQ – *intelligence quotient:* Methods of measuring IQ have not improved in either accuracy or reliability. The basic tests developed by Binet and others earlier in the

twentieth century are as good as it gets. As with all measurements they are subject to error, which must cast the first doubts on Young's mechanism—mavericks would still slip through or be failed by the system of testing. Another mistake is to assume that if a strong correlation exists, then a fully determined relationship exists. Even the best predictions—for example 11+ test and GCE results at age 16—only explain about 70% of the variability; the remaining 30% comes from elsewhere. Even the last link in the chain—through 'assortive mating', that clever people would only mix and mate with each other, and hence selectively breed a new super-intelligent species, Young probably knew he was mistaken, but then he never claimed that his book was anything other than a satire. Assortive mating does take place, but instinctual biological drives will often result in a high-status male choosing a dim but attractive female. In any event the wellknown phenomenon of 'regression towards the mean'—that cleverer couples tend to have less bright offspring, and similarly the dim tend to have less dim children, effectively destroys the eugenicists' fantasy.

Effort is clearly important, but measuring it is not scientific, only a matter of valuejudgment. A more recent attempt to measure 'effort' came in a paper by economists in Audas, Barmby & Treble 'Luck, effort and reward' (2003). Effort was identified for a group of workers as lack of absences, plus good supervisor ratings.

How tests of ability work: Two examples

These are tests which have been widely used and which have also been subject to close scrutiny. It is also possible to identify the fudges—subjective adjustments—which have been made by officials in order to keep the tests useable and acceptable.

1. The 11+ :School selection using an intelligence test

(This section draws heavily on Vernon (1957), who reviewed the evidence for the effectiveness of the eleven-plus IQ test. A more recent publication by Gipps and Murphy (1994) covers some of the same ground but does not challenge any of the

earlier figures which were produced concerning the accuracy and reliability of this test.)(This is an extract from Boyle(1998))

The objective of the British eleven-plus test was to measure the IQ of all children in the 11-year-old cohort within each local education authority (LEA). This could involve tens of thousands of school-children in a single authority (borough), so there was plenty of scope to establish fair and efficient procedures. On the basis of their scores on the test, a percentage of the pupils from the cohort, which ranged from 14% in Nottinghamshire to 60% in Merionethshire, were allocated to grammar schools, in the belief that they could benefit from an academic style of education.

The measure of success for the eleven-plus test was very simple: how well did the test predict the performance of the cohort 5 years later at the General Certificate of Education (national, public) examinations? The short answer is very well indeed, especially compared with alternative methods of selection and prediction. These were:— conventional examinations in mathematics and English, ranking by teachers and special entrance examinations set by individual schools. A global figure for the reliability of IQ tests in predicting later examination scores was estimated by Vernon(1957) at a correlation coefficient of 0.70. All other methods showed lower correlations.

The implementation of the eleven-plus test varied from one LEA to another. It was appreciated that the test was not perfect, and that a sharp cut-off point would result in the unfairness of candidates being wrongly allocated. For this reason most LEAs adopted a 'border zone' procedure, calling for further reports on candidates who fell just below the cut-off point. As time went on this border zone shrank, mainly for practical reasons. What was needed, according to one shrewd local councillor, was a test which was 'technically sound, administratively feasible and politically defensible' (Vernon (1957), p. 30). The IQ test seemed to be sound. For administrative and political reasons the border zone was progressively shrunk.

A well-known feature of the 11+ test was that girls consistently outperformed boys. This early maturation of cognitive abilities in girls was normally reversed in later schooldays. To allow for this, selectors imposed strict quotas, so that equal numbers of boys and girls would appear in the first year at grammar school.

The 11+ test has been subject to intense scrutiny, and most commentators have found a range of deficiencies.(for example Rose, Lewontin and Kamin, 1984) Their solution—abolish the 11+ and switch to a teacher-based assessment was carried through in the 1950s in South-West Hertfordshire (Gipps, 1994). The result was that fewer working class children were accepted at the Grammar schools, a result not quite in line with the hopes of social reformers.

The question of whether selection 'works' is still an open one—that is to say, if children are creamed off into one of the remaining Grammar schools would they perform better than expected had they gone to the local 'bog-standard' comprehensive. This theory has been tested by the National Audit Office (NAO, 2003). They admit that they cannot fully take into account all of the socio-economic factors which are so significant in modifying school performance: Yet based on research they commissioned they conclude that: 'as a group, selective schools (i.e. those still using the 11+) perform significantly better on average at Key Stage 3, but below average at GCSE level.' Faint praise indeed!

2. Scholastic Aptitude Tests (SAT) in the US

How SATs Work: SAT is the three-hour exam that measures a high school student's chance of academic success in the first year of college. Some colleges consider SAT scores major factors in their admission process, while others view high school academic performance, along with recommendations and extracurricular activities, equally, or even more, important.

The **SAT I** measures **verbal** and **math** reasoning abilities. The multiple-choice test, developed by the not-for-profit <u>Educational Testing Service</u>, is intended to let students demonstrate their verbal and math abilities without regard to the kind of schooling they've had. According to the College Board, the test looks for a student's ability to understand and analyse written material, to draw inferences, to differentiate

shades of meaning, to draw conclusions and solve math problems—all skills that are necessary for success in college and the work world.

SAT II: Subject Tests measure a student's knowledge of a particular subject, such as English (writing or literature), history and social sciences, mathematics (various levels), sciences, and languages (Chinese, French, German, modern Hebrew, Italian, Japanese, Latin, Spanish, English). Some colleges require one or more SAT II tests, but even if they aren't required, SAT II tests scores can help present a more personalized portfolio that illustrates how well you would fit at a particular school. Most colleges use SAT II scores not for admission purposes but for program placement and counselling. (from howstuffworks.com)

There is wide disquiet about the use of SATs as reported in the Guardian (2000) Consistent differences emerge between males who score higher, and females. Yet it is females who generally perform best on their university courses. There are large average differences between ethnic groups. Bob Schaeffer, a critic of the tests, runs the National Center for Fair and Open Testing (FairTest) considers that the top universities' habit of requiring high minimum SAT scores are flagrantly misusing the test scores.

To overcome the differing gender outcomes, it is the practice according to Gipps & Murphy (1994) to modify the questions to ensure equality of outcome between the sexes. This involves taking out questions where boys score well and adding in girl-friendly ones.

Personality testing:

Just like intelligence tests, tests are available to assess personality. It is more difficult to assess personality than it is to assess intelligence. Intelligence is an ability. It is not possible to score higher than your ability lets you. In measuring personality cheating can become a problem. It is less difficult to pretend you are different from the way you really are. There are two ways of assessing personality: by using projective tests and by using self report tests.

Projective tests

The picture on the right is an example of an item in a projective test. You can find it in the Rorschach inkblot test. The person tested will be asked what he sees when he looks at the picture. In other words, he is asked for his interpretation. The interpretation someone gives of an ambiguous picture like this is believed to provide relevant information about the personality of that person. For example, if you see two evil eyes that stare at you, that might mean that you have a somewhat paranoid personality. (Picture of the blot not included.)

Self report tests

Self reports test are completely different from projective tests. Let's take a look at a possible item of a self report test:

You have nothing to do this evening. You've been looking forward to relaxing, because you've worked very hard the last few days. At 20.00 PM the phone rings. You pick it up and you are invited by a friend to go out to the cinema. The movie begins at 20.30 PM. What would you do?

A You react very positively and leave right away

- B You say you like the idea but don't feel like it right now
- C You don't know what to do at first, but eventually you let your friend talk you into it

This situations may say something about just how introvert or extravert you are. You will understand that it is easy to see what this item measures. Therefore, it is also relatively easy to cheat.

(from www.psyonline.nl/en-presoon.htm)

An academic view of the topic can be found at: <u>http://pmc.psych.nwu.edu/personality.html</u>

Appendix B. Measuring Happiness: An Example

MEASURING HAPPINESS: A pilot study

This Appendix serves two functions in relation to this thesis:

-it provides an example of a valid questionnaire which measures the abstract concept 'happiness'. Earlier, in chapter 1, the idea of elicitation using similar questionnaires was introduced, primarily to test if respondents thought that random allocation would be 'fair'. I criticised the methodology, especially in relation to identifying consumers feelings, so I include this example to show how it should be done.

-it provides some evidence (in chapter 3) for the 'rent-dissipation' involved in winning the prize of a university place.

Originally I had hoped to use measured happiness (Subjective Well-Being in the jargon) as a basis for identifying satisfaction with selection mechanisms for university students. Measuring 'happiness' would subsume all the motives of individual satisfaction, interpersonal comparison, and broader feelings of fairness and justice, without having to get involved in the messy business of what each contributed to overall happiness. To this end in September 2003 I conducted a pilot 'happiness survey' on first year (newly arrived) Economics students at University of Wales, Swansea. Full details of the questionnaire and the results are given later in this appendix.

The Questionnaire I used to measure 'happiness' was: GHQ-12 – General Household Questionnaire, which I obtained from the ESRC Archive Essex. This has been widely used, tested and validated, for example by Oswald at Warwick University. In addition I posed some factual questions which I hoped would correlate with measured happiness.

The results proved interesting, but also showed up the fundamental flaw as far as any proposed research of mine was concerned. Because measured happiness is so variable from one individual to another, it is difficult to make valid inferences between small groups. It is possible to detect small but significant differences when samples are very large: For example van Praag & Baarsma (2005) were able to use large-scale happiness surveys to establish reactions to airport noise. My sample of about 80 students was far

too small to establish comparisons with another group subject to a different admission procedure.

What follows is

- The Questionnaire as applied to 87 students (82 used, 5 unusable) present on Friday afternoon, 26th September 2003.
- A brief Report, summarising the conclusions from my analysis of their responses.
 The original data from the completed questionnaires

Feedback on the 'happiness' questionnaire:

(as posted to students who responded)

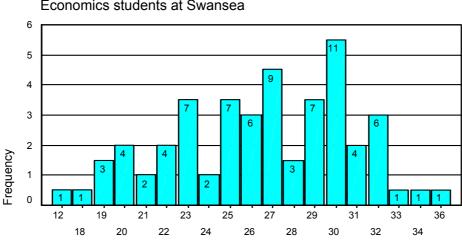
First year Economics students at Swansea 2003

Thanks for helping me with your responses, and answering so many strange questions so reliably, late in the afternoon on Monday, 29th September.

Your happiness scores based on the 12 questions: Overall you are a cheerful group, significantly happier than the population at large:

Economics students at Swansea: Mean score 26.6/36 Major survey of the population: Mean score 25.0/36

Of course, individual scores varied quite a lot as shown by this histogram



Happiness score

Economics students at Swansea

Score (max 36)

Individual happiness questions also varied quite a bit

-the happiest response was for: 'do you think your worthless?' A: 'not at all' and-the least happy: 'have you been able to concentrate?' A: 'better than usual'

There were three questions about the amount of extra effort you put in to get here:

- 1. Repeat subjects to improve grades? ¹/₄ said yes, with 1,2 or 3 subjects repeated. The supplementary question on extra time spent on these repeated grades averages out at about 4 months per repeating student.
- 2. Extra time for better grades? $\frac{1}{4}$ said yes with an average of 2 hours per week spent by each student who spent the extra hours
- 3. Time spent on the application process: The median value was about 10 full days per student spent on form-filling, interviews.

My tentative conclusion about your 'Rent-seeking' (the economists' term for effort spent trying to win a prize—effort which isn't useful in itself) Combining the three time-spending items and spreading the times over all students gives an average value of about TWO months spent over and above the basic requirement to be adequately qualified for entry.

Am I on the right course and at the right university? 85% said 'yes' and 'yes'. Hope you still feel so positive at the end of the year!

Now for a bit of fancy Analysis: Can your Happiness score be explained in terms of any of the other factors identified?

Using a standard linear multivariate regression model where Y is the Happiness score, which is to be explained in terms of

Variable X	in units of	Regress coeff	t-value	Interpretation as expe	cted?
Age	in years	-1.188	1.34	older->glummer	?
Sex	M=1 F=2	-2.32	1.85	M happier than F	?
UCAS tariff	actual score/100	-0.825	.57	More pts->glummer	×
Repeat subjects	N=0 Y=1	0.905	.47	repeat = happier ©	×
Extra study time	N=0 Y=1	-0.577	.32	spend extra time->glum	\checkmark
Days on applic	days	-0.007	.68	more days-> glum	\checkmark
Right course	1=yy 2=yn 3=nn	-0.340	.25	wrong-er -> glum	\checkmark

<u>BUT</u>—none of these factors gives much of an explanation, a result which is shows up on the Index of Determination of just 3.3%. So the reasons why you are more or less happy than others in your group is due far more due to your own personality, and not whether you are a bit older than the rest, or scored fewer UCAS points, or spent an extra year repeating subjects.

Many thanks for your help.

Conall Boyle

Comments or questions to 301380@swansea.ac.uk

RAW DATA FROM THE COMPLETED QUESTIONNAIRES:

(on the following two pages)

Appendices

Re	1.1	1.	1	1.3	2.1	2.1	2.1	2.2	2.2	2.3	2.4	3.	4	4	4	4	4	4f	4	4	4i	4j	4	41
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2	18	2		200	0			0		10	0	1	2	2	2	2	2	2	2	2	2	2	2	2
4	18	2		280	0			0		14	0	1	3	3	2	2	3	3	2	2	3	2	2	2
5	19	1		240	0			0		10	0	1	2	1	1	2	2	4	1	2	1	1	1	1
6	19	1		ABE	0			0		10	0	1	2	1	1	1	2	1	2	2	1	1	1	2
7	19	1		BCC	0			0		3	0	3	3	3	2	3	2	3	1	2	3	2	2	3
8	19	1		280	1	3	0	1	4	30	0	1	2	1	2	1	3	2	2	1	3	3	1	2
9	19	1		280	0			0		20	0	1	2	1	2	3	2	1	2	2	1	2	1	2
10 11	18 19	2		200 260	0 1	2	0	0	2	10 10	0	2 1	2	2	2	2	3 3	2	3	2	2	2	2 2	2 2
12	19	2		200	0	2	0	0	2	7	0	1	4	3 1	2	<u> </u>	2	2	<u> </u>	2	2	2 1	2	2
13	17	2		0	0			0		2	0	2	1		'	-	2	2	1	2	2	-	_	-
14	18	1		240	0			0		2	0	1	2	1	2	2	1	1	2	1	1	1	1	1
15	18	2		260	0			0		3	0	1	2	1	2	2	2	1	2	2	1	1	1	2
16	20	2		280	1	1	12	1	10	14	0	1	2	1	2	2	1	1	2	2	1	1	1	2
17	19	2		0	0			0			0	2	3	2	3	2	3	2	3	2	2	1	1	3
18	18	1		220	0			0			0	1	1	1	2	2	2	1	1	2	1	2	1	1
19	18	2		200	1	3		1	30	20	0	1	2	1	2	3	2	1	2	2	2	1	1	1
20	18	1		240	0			0	5	10	0	1	2	2	2	2	1	2	3	2	1	2	1	2
21 22	18 18	1		280 280	0 0			1 0	5	10 5	0	1 1	2	2	2	2	2	1	2	2	2	1	1	2
22	20	2		200	0			0		30	0	2	2	2	2	2	2	1	1	2	2	2	1	2
24	23	1		0	0			0		14	0	1	2	2	2	2	1	3	3	1	1	1	1	2
25	19	1		0	0			0		50	0	1	1	1	1	1	1	1	1	1	1	1	1	1
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27	19	1		0	0			0		10	0	1	2	2	2	3	2	2	3	2	2	1	1	1
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31 32	21 18	1		0 280	0			0		180 4	0 0	1 1	2	2	2	2	2	1	3	3	3 1	2	1	2
33	10	2		280	1	2	12	1	7	4 14	0	1	2	<u> </u>	2	1	2	1	<u> </u>	2	1	2 1	1	1
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35	18	1		0	1	3	0	1	10	7	0	1	1	1	2	1	2	3	1	2	4	3	4	2
36	19	1		280	1	1	0	1	4	10	0	1	1	1	2	2	2	1	2	3	3	2	1	1
37	19	1		220	0			0		100	0	1	2	1	2	1	2	2	2	1	2	2	2	2
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51	18	2	240	1			0		2	0	1	1	3	3	3	2	3	2	1	3	1	1	3
52	18	2	240	0			0		8	0	1	2	3	2	3	4	3	2	2	2	2	2	2
53	19	1	140	0			1	3	30	0	1	1	3	1	1	2	2	1	1	1	1	1	1
54	18	1	120	0			0		150	0	1	1	3	1	1	2	2	1	1	1	1	1	1
55	20	2	120	0			1	20	7	0	1	2	2	3	2	2	3	2	3	3	2	2	2
56	20	2	120	0			0		7	0	1	2	2	3	3	2	3	2	2	3	3	2	3
57	18	1	260	0			0		7	0	1	2	2	2	1	2	2	2	1	2	1	2	2
58	18	1	0	1	1	0	0		5	0	1	2	1	2	2	2	2	3	1	1	1	1	1
59	18	1	240	0			0		5	0	1	2	2	2	2	2	2	2	2	2	2	1	1
60	18	1	300	1	1	12	1	5	20	0	1	2	1	2	1	2	1	2	1	1	1	1	2
61	18	1	280	0			0		30	0	1	2	2	1	2	3	3	2	2	3	3	1	1
62	19	2	bbb	0			0		3	0	1	2	2	3	2	1	1	2	2	1	1	1	1
63	18	1	280	0			0		5	0	1	2	2	2	2	3	2	1	2	2	2	3	1
64	19	1	280	0			0		2	0	1	1	1	1	1	2	1	4	2	2	1	1	1
65	18	1	280	0			0		100	0	1	1	3	4	2	4	2	1	1	3	1	1	2
66	19	1	0	1	2	4	0		5	0	3	1	1	2	2	2	1	2	2	1	1	1	2
67	19	2	0	0			0		2	0	1	2	2	2	2	1	1	2	1	2	1	1	2
68	18	1	240	0			1	10	10	0	1	2	3	3	2	3	1	2	2	2	2	1	2
69	20	1	280	0			0		30	0	1	2	2	1	2	3	3	1	2	2	3	4	1
70	18	1	300	0			1	50	180	0	1												
71	18	1	260	0			0		3	0	1	2	1	2	2	1	2	2	2	1	1	1	2
72	18	2	280	0			0		3	0	1	2	1	1	1	1	1	1	2	1	1	1	1
73	19	1	220	0			0		4	0	1	2	1	2	2	1	1	2	2	1	1	1	2
74	18	1	240	0			0		4	0	2	2	1	2	2	2	2	3	2	1	1	1	2
75	18	1	220	0			0		5	0	2	2	1	2	2	1	1	2	2	1	1	1	2
76	18	2	260	0			0		10	0	3	2	1	2	1	1	1	2	2	1	1	1	1
77	18	1	300	1	1	0	1	12	20	0	1	2	2	2	2	2	1	2	2	2	1	1	1
78	18	2	260	0			0		10	0	1	3	4	4	3	2	2	3	3	3	3	3	3
79	18	1	300	0			0		20	0	1	2	1	1	2	2	1	1	2	2	1	2	1
80	19	2	300	1		12	1	15	60	0	1	2	3	2	2	2	2	3	2	3	1	2	1
81	19	2	280	1	1	12	1	8	100	0	1	2	2	2	2	2	2	2	2	3	2	2	2
82	18	2	280	1	1	12	1	6	30	0	1	2	2	2	2	2	2	2	2	3	2	2	2
83	18									0	1												
84	18									0	1												
85	18									0	1												
86	18									0	1												
87	18									0	1												
88																							

Conall Boyle random distribution

Appendices 19