Mathematical Challenge 2003–2004

Bill Richardson

This major event continues in much the same way as it has over recent years. That it does so is a remarkable tribute to those who set it up and the many volunteers who contribute to its operation.

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*1866*	2325	*3520*	2224
Problems 2	*1643*	1839	*1669*	1006
Problems 3	*1504*	1517		
Number of entries	*5013*	5681	*5189*	3194
Number of entrants	*2178*	2421	*3682*	2292
Number of schools	*331*	355	*219*	199

The table above gives a summary of the two previous years. It shows that uptake in the primary division increased in every way but that in the secondary division it decreased. It is striking that, although the number of secondary entrants fell significantly, the drop in the number of schools was relatively small. The National Committee are very conscious of the pressures there are in schools with Mathematical Challenge having to compete with many other activities. Nevertheless, it does continue to thrive. However, we would very much like to hear from you if you can suggest any reasons why there is such a decline in secondary uptake and what, if anything, can be done to halt or reverse the trend.

The committee for 2004-2005 is:

Section Organisers

1   Dr Colin Maclachlan
1(P) Ms Helen Martin
        (both of the University of Aberdeen)
2   Dr Giles Thomas (University of Dundee)
3   Prof. Jack Carr (Heriot-Watt University)
3(P) Mr Eric Brown (University of Edinburgh)
4   Dr Frances Goldman
                (University of Glasgow)
4(P) Miss Jennifer Moffat
                (University of Strathclyde)
5   Dr Anne Cockroft (University of Paisley)
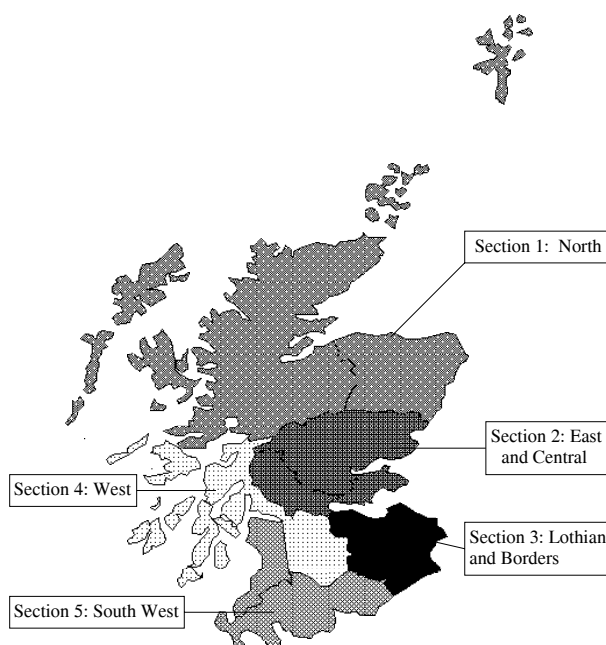
Secretary
Dr Giles Thomas (University of Dundee)

Treasurer
Miss Hannah Fulford (Preston Lodge HS)

Other members
Mr Craig Stewart (Bearsden Academy)
Mr John Thomson (Braidfield HS)

Section 1: North
Section 2: East and Central
Section 3: Lothian and Borders
Section 4: West
Section 5: South West

Once again, I should like to express my gratitude to the members of the National Committee who give of their time to run the competition. I must also thank schools and other employers for allowing the Committee to have time off to attend the three meetings. There have been some changes at the end of 2003–2004. After a three year stint, Adam McBride handed back the running of Section 4 (secondary) to Frances Goldman. After a similar length of time, in

Section 3 (secondary), Diana Mackie has given way to Jack Carr and in Section 2, after many years, Mike Roberts has stepped down and Giles Thomas has taken over. All of these deserve thanks, both the 'old' and the 'new'.

The following reports are from the relevant Section Organisers.

Section 1 (North)

The number of entrants this year in the secondary sections has dropped considerably from last year although the number of schools participating is about the same as in previous years. There was, however, a pleasing increase in the numbers taking part in the senior section. The participants and the prize winners came from all over the region. There was a particularly notable achievement in the middle section where the top mark was achieved by Eilidh O'Neil, an S2 pupil from Portree High School.

In the primary section, the number of entrants has increased from last year although the number of schools remains the same. Out of the 62 schools which entered 29 of these had pupils gaining awards (13 schools had pupils gaining gold awards). Particular congratulations should go to Nicola Stewart (Cullicudden Primary School) and Ross McCallum (Danestone Primary School).

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*228*	289	*388*	303
Problems 2	*204*	214	*199*	141
Problems 3	*151*	155	–	–
Number of entries	*583*	658	*587*	444
Number of entrants	*267*	291	*400*	311
Number of schools	*62*	62	*42*	40
Gold Awards	*15*	22	*45*	27
Silver Awards	*19*	24	*40*	26
Bronze Awards	*22*	27	*25*	13
Total of Awards	*56*	73	*110*	66

The prize-giving ceremony was held at the University of Aberdeen on 7th June 2004. Sixty five of the Gold, Silver and Bronze award winners, accompanied by teachers and parents from all over the North of Scotland attended. They were kept busy with two workshops, one before and one after lunch, on the topic of "Perfect Rectangles" organised by Dr. Colin Maclachlan of Aberdeen University, assisted by some of his colleagues.

Professor John Hubbuck of the Department of Mathematical Sciences at the University of Aberdeen presented the prizes to the award winners.

As always, we are very grateful to our team of markers for their assistance throughout the year.

Colin Maclachlan and Helen Martin

Section 2 (East and Central)

The total number of Primary entries was considerably more than that of last year and was comparable to 2001-2002. In contrast there was a decrease in the number of Secondary entries mainly due to the Middle division for which the total was 123 compared with 241 last year.

The prize-giving was held in the Bonar Hall of the University of Dundee. The guest lecture was delivered by Dr Ian Anderson, of the University of Glasgow, who is also the chair of the Scottish Mathematical Council. Ian's talk was entitled "Mathematics in the supermarket – the arithmetic of barcodes" and he gave interesting examples of ISBN codes, credit cards and

library books. The audience were very appreciative and thoroughly enjoyed the interactive nature of the delivery.

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*315*	428	*775*	645
Problems 2	*243*	378	*357*	302
Problems 3	*227*	296	-	-
Number of entries	*785*	1102	*1132*	947
Number of entrants	*335*	486	*828*	670
Number of schools	*60*	81	*56*	55
Gold Awards	*26*	33	*55*	40
Silver Awards	*36*	37	*56*	40
Bronze Awards	*32*	34	*74*	39
Total of Awards	*94*	104	*185*	119

The presentations were followed by refreshments and the award winners had their photographs taken by the local press, by teachers and, especially the Primary winners, by proud parents and even grandparents!

I received many comments of appreciation for the event from the participants and I would like to take this opportunity to thank Ian Anderson for his inspiring talk and Giles Thomas for the effectiveness of the local organisation.

Mike Roberts

Section 3 (Lothian and Borders)

The Primary and Secondary sections were organised separately with Eric Brown of the School of Education, the University of Edinburgh looking after the Primary schools.

The statistics, including certificates awarded are as follows:

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*397*	438	*754*	445
Problems 2	*388*	376	*355*	225
Problems 3	*326*	319	–	–
Number of entries	*1111*	1133	*1109*	670
Number of entrants	*502*	465	*804*	476
Completing all sets	*260*	284	*302*	221
Number of schools	*47*	48	*39*	32
Gold Awards	*21*	23	*40*	14
Silver Awards	*30*	32	*52*	53
Bronze Awards	*51*	40	*88*	47
Total of Awards	*102*	95	*180*	114

Fewer school took part in the secondary division competition within our region than previous years and the number of entrants was correspondingly lower. A substantial fall in entries from our largest school following a change of staff made the numbers even lower. Approximately half the entrants completed both sets of problems. In the Primary division the numbers of schools and entrants were broadly similar to last year.

The prize-giving ceremony took place on Friday, 4th June in the Swann Building of Edinburgh University. Professor Pamela Munn, Dean of the School of Education addressed the audience of pupils, teachers and parents and presented certificates and mugs to the 67 senior and 55 primary winners of gold and silver awards. After refreshments, Professor Bob Kaplan and his wife Ellen, both from Harvard University, delivered a fascinating talk entitled "The Pleasures of Mathematics". Their interactive approach kept the whole audience interested and involved in solving the given problem.

<div style="text-align: right">Diana Mackie and Eric Brown</div>

Section 4 (West)

Section 4(P) consists of all primary schools in East and West Dunbartonshire, North and South Lanarkshire, Argyll and Bute and Glasgow. As usual, initial contact was made with each school via their Local Authorities. Once registered, communication was then directly between the school and the Section organiser. This year, the Primary Section was organised by Jennifer Moffat, a Senior Lecturer in the Faculty of Education of the University of Strathclyde. The Secondary Competition in Section 4 was again organised by Professor Adam McBride (University of Strathclyde).

Primary pupil scripts were marked by students in initial teacher education: by final year BEd students, by Post Graduate (Secondary) Mathematics students and by students following the BSc in Mathematics with a Teaching Qualification. The marking was supervised by four tutors. All students enjoyed the exercise and found the insight into the mathematical ability of P6/7 pupils an illuminating experience. For the Secondary entrants support was provided by a number of volunteer markers whose help is gratefully acknowledged.

Relevant statistics are as follows:

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*725*	901	*879*	410
Problems 2	*609*	659	*358*	163
Problems 3	*629*	566	–	–
Number of entries	*1963*	2126	*1237*	573
Number of entrants	*853*	901	*904*	414
Completing all sets			*333*	159
Number of schools	*124*	124	*49*	41
Gold Awards	*32*	30	*26*	16
Silver Awards	*68*	61	*33*	32
Bronze Awards	*82*	73	*41*	18
Total of Awards	*182*	164	*100*	66

Awards were made to 29% of the Primary pupils sending in entries to all three sets of problems. In June 2004, an awards ceremony was attended by the Gold and Silver award winners accompanied by parents, grandparents and teachers. The young mathematicians were inspired by a brain-teasing lecture from Professor Adam McBride followed by a brief workshop arranged by staff of the Mathematics Department at Jordanhill.

There was a big drop in entries from Secondary pupils in comparison with the previous session, which was very disappointing. Most entries were in the Junior Division with only 19 Seniors, another disappointment However, there were still excellent entries at all levels. The Awards Day was held at the University of Strathclyde on Thursday 10 June. Adam McBride gave an interactive talk/workshop entitled 'BIG is beautiful: an excursion into the world of very large numbers'. A fair number of parents and teachers were present throughout. To conclude the

proceedings, the Chairman of the Scottish Mathematical Council, Dr Ian Anderson (University of Glasgow) joined Adam McBride to present mugs and certificates to the Gold and Silver award winners.

Jennifer Moffat and Adam McBride

Section 5 (South West)

It is pleasing that the numbers of entries and entrants to the primary challenge have increased by about 20%, with many good entries. It seems that primary school pupils are increasingly keen to take up the challenge.

However, although the number of secondary schools entering the challenge is similar to the previous year, the number of entries has almost halved. The round 1 problems seemed to cause particular difficulty this year.

	Primary Division		Secondary Division	
	2002-03	2003-04	*2002-03*	2003-04
Problems 1	*201*	269	*724*	421
Problems 2	*199*	212	*400*	175
Problems 3	*171*	181	*–*	–
Number of entries	*571*	662	*1124*	596
Number of entrants	*221*	278	*746*	421
Number of schools	*38*	40	*33*	31
Gold Awards	*6*	16	*25*	20
Silver Awards	*10*	28	*38*	30
Bronze Awards	*14*	29	*50*	35
Total of Awards	*30*	73	*113*	85

All award winners with their families, friends and teachers were invited to either the Dumfries Campus or the Paisley Campus of the University of Paisley. On each occasion, a short talk on random numbers was given by Dr Neil Pitcher of the University of Paisley, the certificates and mugs were presented and the events ended with refreshments. There was a good turnout at both events, which will perhaps encourage more entries next year.

Thanks are due to all the markers: from schools, from the University of Paisley, and also some retired teachers. I am also grateful to Elizabeth West, who looked after the primary section, and the students and staff of the Education Faculty of the University of Paisley at Ayr who marked the round 3 primary entries.

Anne Cockroft