

Observations on EGMO 2015

Joseph Myers

April 2016

Introduction

The fourth European Girls' Mathematical Olympiad (EGMO) was held in Minsk, the capital of Belarus, between 14 and 20 April 2015.

I participated in this event in my usual roles of IT and Coordinator, travelling with the UK team but not as part of the UK delegation. The UK team consisted of Olivia Aaronson, Rosie Cates, Kirsten Land and Joanna Yass, with the leader being Jo Harbour and the deputy leader being Jenny Owladi. More about the EGMO 2015 experience from a UK perspective may be found in Jo's report as leader¹ and in the team's student report.² These observations should be read as a supplement to those reports, in the spirit of Geoff Smith's Observations on IMO 2011 and IMO 2012. Pierre Haas's report from a Luxembourg perspective may also be of interest.

Diary

14 April I meet Jo at Cambridge station, Jenny at King's Cross and the team at Heathrow. There are no direct flights to Minsk from London today, so we are flying with Lufthansa via Frankfurt.

British government travel advice warns against consuming various local food in Belarus, including dairy products, because of fallout from Chernobyl, so Jo has brought a week's supply of milk for making tea. A concerned parent, meanwhile, has supplied us with an extra suitcase full of bottled water, in case this is unavailable in Minsk.

We check in, remarking on how three of the four team members have the middle name Rachel, have lunch and watch with concern as the delay on our flight to Frankfurt steadily increases. Eventually the flight takes off at the time it should be landing in Frankfurt. On arrival in Frankfurt we find we have missed our connection. Lufthansa offers alternative flights via Vienna early the next morning, or flights via Moscow involving spending several hours overnight in Sheremetyevo airport and not reaching Minsk

¹Not available as of April 2016.

²Also not available as of April 2016.

much earlier. We opt to spend the night in beds and go via Vienna, mindful also that travel via Moscow without transit visas could prove difficult.³

Lufthansa puts us up in an airport hotel. UKMT policy, as promulgated by Geoff Smith, is that all UK adults at international competitions should have single rooms. But Geoff is not coming to EGMO this year, and Jo asserts her independence by saying that she and Jenny can share a room tonight.

We get a bus to the hotel. Some people are given rooms that are already occupied, but eventually this is sorted out and we have dinner and warn the EGMO organisers of our late arrival.

Arriving late at EGMO means missing the opening ceremony. It also means that the English language paper, and most of the translations, will be done before we arrive. I send warnings that the Americans should not try to smuggle American spellings into the English paper, and instructions on collecting the translations from leaders in my absence.

15 April We leave the hotel for the airport at 06:15, fly to Vienna and this time make the connection to Minsk. Jo's and my bags, however, have been sent direct to Minsk on a later flight, so we need to wait some time in baggage reclaim while the rest pass through customs and have some food. Eventually our bags arrive and we are met by EGMO helpers and taken to the Academy of Postdiploma Education, where EGMO is being held. En route, we see the rhombicuboctahedral national library from the road. We have a late lunch, and complete forms listing the food we propose to eat at each meal for the rest of EGMO (after which we then ignore those choices and eat what we feel like every time). Plenty of bottled water is available, including giant six-litre bottles in our rooms.

Jo and I join the Jury meeting at 5pm. Contrary to my expectations from previous years, the English language wording is still being considered, and the discussion has only reached problem 3. Despite this, leaders produce their translations efficiently and all 24 language versions of both days' papers are approved that evening. As problem captain for problem 5, I also spend some time thinking about the mark scheme for that problem.

16 April Schoolchildren lead us to the local school where the exams are being held. The Jury deals with queries from contestants for the first half hour of the exam, largely relating to problem 2. We return to the Academy for discussion of mark schemes for today's paper. Day 1 scripts for leaders and coordinators arrive that afternoon.

³Flights from Russia to Belarus count as domestic and so need transit visas. Another team arrived late at EGMO because they only discovered this on arrival at their local airport with bookings for such flights and no such visas.

17 April Again we deal with queries. I present the mark scheme for problem 5. Scripts arrive in the afternoon, and I work through those for my table with my coordination partner.

The UK is on my table, so I ask my coordination partner to look at those scripts, without telling him my thoughts, to make sure I am not being overly generous. The tricky script is Rosie's. Her script involves division by 2 to an even modulus, carried out incorrectly. If you correct this division and carry through the correction to the rest of her script, everything works out the way she did it with no extra cases required. Since the mark scheme says that the results of such divisions (such as $\frac{1}{2}n(n+1) \pmod{n}$) may be stated (as something depending on the parity of n) without justification, this seems like a minor mistake justifying a score of 6. My coordination partner, however, proposes a score of 7, and I have to convince him that there is actually a mistake in the script at all.

18 April UK leaders are hyper-honest in coordination about not asking for more than a script deserves, and when Jo and Jenny come in to coordinate problem 5, they request only 3 marks for Rosie. We explain the approach being taken to such mistakes on this problem, where we see what extra cases are needed if the correction is carried through the solution. They go away to verify that no extra cases are needed, and come back willing to accept 6. The spirit of EGMO is that coordination is a dialogue between leaders and coordinators to discover what a script is worth, not an adversarial process where the leaders are always seeking a higher score than the coordinators, and Rosie is pleasantly surprised by the increased score.

Most coordinations finish smoothly, but problem 2 has long combinatorial essays in many languages. Eventually the Hungarian coordination on that problem finishes after two and a half hours, and at 17:38 we have a complete set of scores.

There is a shortage of people interested in EGMO AB membership, so there are no contested elections. Medal boundaries are approved. Romania are announced as hosts of EGMO 2016; Switzerland were previously agreed as hosts of EGMO 2017, but the announcement delayed for internal approvals. The Dutch are always good providers of games at EGMO, and after dinner I join the UK and Dutch teams playing Avalon.

19 April We go on an excursion to the town of Mir, seeing the castle, the town and an exhibition on the Jewish ghetto and having lunch at a restaurant of traditional Belarusian cuisine. Most of the UK people have some form of dietary requirement, and the UK guide Veranika seems amused at all the questions about what is contained in some dish, or requests for vegetarian food.

Departure from Mir is somewhat delayed, with long queues for the single

toilet at the restaurant. It seems we will not reach Minsk until after the closing ceremony is scheduled to start. The guides tell us that it will start at the scheduled time regardless, without allowing for us to reach Minsk, get dressed up and fetch the flag.

On the bus, I observe that if Geoff were here, he could use his presence and influence to get the closing ceremony pushed back. Some of us wonder if he can work his influence from afar, and Jo Yass texts him to ask him to do so. He replies professing inability to get in touch with the organisers while away from home with no email access, but nevertheless, on arrival back at the Academy, we are told that the ceremony has been put back sufficiently for us to get ready for it.

At the ceremony there is a performance by a past Belarusian entrant to the Eurovision Song Contest. I present the honourable mentions, and am presented with my own framed certificate. The ceremony is followed by the usual dinner / party with dancing.

20 April In the morning UK people go to a shopping centre. Jo is unable to locate her phone when packing and needs Jenny to phone her before it can be located under her spare bed.

The team have some flowers from the closing ceremony to find a home for. They offer them to Veranika, but girls cannot give flowers to girls in Belarus. They propose giving them to me for me to give to Veranika, but girls cannot give flowers to boys in Belarus either. Apparently girls can leave flowers at memorials, but there aren't any nearby.

We go to the airport and, despite Jo initially leading us to the wrong gate, eventually board a flight to Frankfurt along with some other teams. Shortly before arrival in Frankfurt, the first landing attempt is aborted because the departing plane in front had not cleared the runway in time.⁴ Despite this, we land in time and make our connection, arriving early at Heathrow, where we go our separate ways.

Thanks

EGMO has a very relaxed and friendly atmosphere and thanks are due to all the participants for maintaining this. Thanks to the Belarusian organisers and the EGMO AB for putting on such a well-run event. Thanks to Jo, Jenny, Olivia, Rosie, Kirsten and Jo for being such nice travel companions and staying in good humour when the travel was more eventful than might be hoped. Thanks to the UK Mathematics Trust for sponsoring my involvement in EGMO, Bev for arranging travel, Don for arranging visas, and Man Group for sponsoring the UK EGMO team.

⁴A parent told us at Heathrow that they'd been watching this aborted landing on a flight-tracking website.