Setters' Notes for ATH2021: The Twelve Days of Cold Christmas

It is never easy picking up someone else's work, even more so when there is no access to the intended answers. Piecing together James Medhurst's ideas from the information we had proved to be something of a challenge overall. For more background on the hunt's evolution see the main solution document. For those interested, there is a breakdown at the end of this document showing which puzzles were devised by James, which underwent some revision, and which were created by the rest of the team. You can make up your own minds about who you think was the better setter!

Setting and Admin

We were all first time setters although had participated in the last four hunts, therefore had a reasonable idea of what should happen during hunt season. Here are some observations and notes that future setters in a similar position may find useful, although seasoned setters may find much of this obvious.

- Teams participate from many time zones - this year we know there were teams from the distant locations of Singapore and California. As times are important for things like hunt release and submission deadlines it's important to be clear on the time zone being used.
- Not all teams have members exclusively from the UK, and several may not have native English speakers. This is a fantastic testament to the ATH in reaching a far ranging audience, but may result in a significant disadvantage if much of the hunt involves difficult wordplay or niche cultural references (Unigate milk ads falling into this category perhaps?). Achieving a balance in the set puzzles is important to level the playing field, although clearly the treasure itself is going to be in England, so one can only go so far.
- This year we released the poster on 26 Nov 2021, and ten Advent puzzles from 1st - 10th December. The release of the main hunt was therefore rather earlier than past precedent suggested (10 Dec 2021). Many teams found this unusual! The expected weekend would generally have been 17 Dec 2021, but this did not easily fit with the Advent calendar and seemed to be what James wanted so we stuck with it. We were guided by the [setter notes](#) and ran it over five weekends, which seemed to be about right based on the successful finds and progress of teams we were monitoring.
- Some teams were confused that a submission date had not been published early in the hunt, so having this visible up front my help teams.
- We monitored ten teams during the hunt, which was extremely useful, although all these teams had past ATH experience and very good or excellent track records. It would have been useful to have been able to see some more novice teams. Interestingly, across all the teams all of the puzzles were solved, so this at least told us that everything was solvable even if not all the teams found a solution to every puzzle.

- Having someone on the team with an IT background is invaluable. We would have been really struggling without Nigel to set up and update the website. The ATH Past Setters are happy to hand over control well in advance of the start of the hunt. We did find one slight snag when trying to upload the final hunt document: the file size was rather larger than intended and breached the 32 MB limit for uploads. There are websites which will compress pdf files for free, which we later made use of.
- We elected to mark the answers ourselves rather than have teams mark their own entries. This was primarily in case we had completely missed puzzles or links in the material inherited from James, although based on the teams we were monitoring we were hopeful this was not the case. We were also still developing some of the mark scheme.
- The marking method was the ATH traditional (marks based on the number of teams getting the correct answer) rather than one point per correct answer. The former method has the advantage of weighting the scoring to reward the things which were harder to solve, but makes marking more complex. We also checked team rankings based on 'marks correct' and the final scoreboard order was similar although not identical.
- We tried to be fair in awarding points to give marks for partial solves as well as reaching the correct final answer. In most cases this worked well. For example, lots of marks could be obtained for identifying the many pictures in the party puzzle without actually knowing what the next steps were. In other cases we found that teams would be getting all or nothing, which resulted in double counting of some marks and greater weight being applied to the importance of some of the puzzles than intended. This was corrected during marking.
- We split the marking into sections to ensure consistency within a page or puzzle, and this sped up the marking process. The time consuming element was then double checking the marking, and hunting through answer documents to find the appropriate answers (some rather well hidden!).The format in which answers are submitted is many and varied, which is not always helpful in marking. Another reason to have teams self mark! Some of the teams went to great effort to illustrate and carefully present their answers - these were much enjoyed by the marking team.

Hunt content

Several teams found the hunt to be a hard nut to crack. During our test solving we found similarly - this was very much a hunt which opened up the more that was solved and the more themes were identified. Several teams commented that they were still solving things even right up to the submission deadline. The lack of an easy opener may have put some new teams off, hopefully not permanently. As image searching is now a matter of course James used stills from videos for many of the pictures as a more difficult alternative. This is one way to go and is hard graft! The more elegant option is to identify the purpose of the picture rather than just the picture itself. A good example of this was the 'PRIME X' pictures on page 13. Almost every team identified all of the pictures but the point here was to note the connection to the 'cold' theme and the acrostic. This approach can mean that some teams completely miss out on points, despite having found the pictures, so there is still a balance to be struck to reward hard work on partial solves.

Treasure location

We were constrained to Cold Christmas by James' themes and puzzles so this was fixed. In many ways it was not a great location due to the complete lack of good parking spots, it was several miles from any mainline train station, and much of the area was open farm land. We also had absolutely no idea what James had in mind for the treasure location or even if he had visited the site. Many teams speculated that James's Wood would have been the perfect location - it was a nice coincidental link but surely James would not have chosen it himself! The wood was actually fenced off and not much of a wood at all. Without a series of pictures to follow we had two options: either a fairly long set of instructions needing an almighty code or a series of short instructions to piece together. We opted for the latter as being easier to achieve with the available material, although we think the former was probably James' intention. He had mentioned an 'as yet unseen main puzzle'!

We thought the treasure would be found far earlier than it actually was. If teams had solved the right puzzles (which we thought were potentially fairly easy) then this should have been the case. In reality, teams concentrated their efforts on all the hard puzzles that needed a lot of effort and ultimately had no real use in the hunt. This is an interesting strategy for a setter - obscure the important puzzles in plain sight by providing much more interesting, and difficult puzzles to delay the treasure finding (and potentially annoy solvers).

Several teams mentioned that there was no 'Logical' at the treasure site. This was not considered to be compulsory so was omitted. None of the team members had ever been part of the ATH in the early days, so it seemed unnecessary. The box itself was clearly labelled once it was unearthed (or un-tree-ed).

Appendix: Puzzle Breakdown

Page or item	Puzzle	Source / Notes
Poster	All	By James - unchanged, except for the update to make it James' Advent Calendar. It was his, after all.
Advent calendar	1st - 5th Dec, 7th - 9th Dec	All by James, although we changed the order for a few of the puzzles to give the Gazetteer clue first followed by Christmas place names, followed by the introduction of the main theme of the Twelve Days of Christmas.
Advent calendar	6th Dec	Devised by James, updated by us.
Advent calendar	10th Dec	New puzzles and locations, devised by us.
1	12 DOC	Almost completely unchanged, except for the addition of Humphrey Bogart, in place of Washington's crossing of the Delaware River.
1	Wordsearch	This was mostly James. Our addition was to use all the unused letters. Hopefully the original version did not contain other messages or codes we completely missed!
Lyrical Cards	-	The majority were provided by James. There were a few we did not understand at all even when told the answers so created

		some replacements (the two on page 2 were our additions). Based on the answers, by far the hardest was 'To Jack and Selena…', whereas the easiest was a tie between The Wombles and The Pogues. James devised all three of these. The idea to match them with the pictures on page 11 was also from James, and the fact that some matched and some didn't was his way of obscuring the final answer. This was frustrating for solvers, but was definitely what James intended.
2	Playfair	Devised by James and we switched a few of the pictures, but basically unchanged.
2	Vigenère	Devised by James, we changed the solution and key. We did not notice that we introduced a bigram of 22 which is not possible in a Playfair, so was a bit of a give-away that the second code wasn't a Playfair.
2	ADFGVX	All devised by us. James had shared a polybius square puzzle which we elected not to use, so it was in keeping with his ideas.
2	Base 36	Our idea of a pun with an employment law link.
3	All	Our tribute to James. We played around with some more complicated ideas for the Olympic rings/James puzzle but settled on the simplest version. There is more about the hex crossword in the main solution document. Even teams with most of the answers had difficulty fitting the words into the grid, so we felt the New Year hint was needed (a letter may look like a ring).
4	Eight maids	The concept was devised by James. We modified the Pitti-Sing card, but it was otherwise as he gave us. The lack of 'a-milking' in the puzzle, and the strange references to milk which we couldn't solve (see post-hunt Facebook/Twitter messages) led us to invent the Humphreys puzzle.
Humphreys	-	We had fun crowbarring eight people called Humphrey (not Humphreys or Humphries) into the hunt. Most teams spotted there were a lot of Humphreys, and that this could not be a coincidence (correct). Only 7 teams noted the Unigate milk adverts, so perhaps this was a bit too niche in the end.
5	Pigpen, Bacon & T9 ciphers	This was entirely James' invention, and was really ingenious. We decided to leave it as it was, with the only change being the swap in of Tina Humphrey and Chandi the collie. Three codes in one is no mean feat.
5	Six degrees of Kevin Bacon	James had added a few clues we didn't really understand as hints to the 'Pigpen to Bacon' transformation. We devised the 6 degrees of KB, but most teams didn't really understand that a Bacon cipher was needed. Ultimately the decoding of the bacon cipher was possibly a bit too ambiguous (NO DOTS).
5	Drummers (turkey legs)	James' concept, we modified a few of the questions and revised the non-drummer ones. The most difficult was number 1 (Hector 'Tico' Torres), which was surprising as we solved this one almost straight away during our test. Only one team correctly identified this drummer, and only two got the final message. This did not stop a few more teams working out the

		PEARS BECOME ACORNS decoding of the T9 cipher.
6	Table	The table was in James' early iteration although was much more involved, had an extra column and more rows. This was simplified considerably, with the addition of pictures and locations to help fill in the table. We thought Christmas number ones would be easy, but were concerned that the Pipe Smoker of the Year might be overlooked. Thankfully several of the teams we were monitoring identified this quickly, much to our relief. Very few teams noted the acrostic from the pictures. If we had thought about it more, some specific locations in the places (such as Houson) with a thematic link would have been a nice touch.
6	Border clues	Someone termed this a 'meta puzzle' which was a nice description. This was one of ours, and in an early iteration was simply a list of years, which was expanded to be actual clues. The clues looked to be incredibly difficult to solve, however, several teams made really good progress and only later noted that there were links to other parts of the hunt. The most obvious ones were ABBA at Eurovision (although many had not spotted ABBA on page 11) and the death of Mary, Queen of Scots.
7 & 8	Party puzzle	James' idea, somewhat simplified by us (yes, really). The original version had the guests arranged differently in the rooms, with different initial words being derived. As some of these were a bit obscure we changed them, but still had to be able to hide SIX TEN EAST NORTH KEBAB AND NORTH, and deliver HAVE A COOL YULE OF MISRULE. This left it fairly limited. We actually devised two alternative combinations. It was also complicated by the additional rule that in some rooms guests were less active than normal (no jumping, jiving or reclining!), so we removed this. No teams spotted that the reason Jeremy Irons did not move to the smoking room was that smoking was allowed in his room under SI 3368. Smoking was also allowed in room 7, but as there were no smokers present this wasn't actually useful. As several teams noted, Gus O'Donnell is not a smoker, but Neil Kinnock is. James' original version had GOD in the smoking room. If we had spotted this we would likely have looked for an alternative rendering of this part of the puzzle.
9	Crackers	The answers were consistent with those James intended, but we reworded the clues.
9	French hens	As devised by James. We had a little help from a French speaker to check our translation.
10	Questions	Concept devised by James, we reworded a few of the questions. We spent a while looking for an acrostic in the answers, but James told us there wasn't one, which felt a bit of an anticlimax. We therefore added the number code at the bottom of the page to indicate what to do with the Questions, i.e. look for 6 dates, one place and two birds (the turtle doves, obviously - apparently not so obvious!).
10	Background map with	Our idea, the lack of accuracy of the map was a challenge for some. We had a problem with this late in the day when it was

	scarf/pins	noted that one of the pointers was apparently in the North Sea, and the original version could not be found. There followed some frantic pixel-colouring in Paint to try to amend what we had. The final puzzle was solvable, although very few teams worked it out completely. Beaufort was the most difficult place to find.
10	Oilfields and Beaufort	The oilfields were from James and were needed in the party puzzle. The Beaufort scale (affectionately called Nuno by several teams) was our addition to instruct what to do with the oilfields, although only half the teams decoded this one.
10	Find X & Y	This turned out to be more challenging than intended. Many teams did not spot that L = Norway or A = Bear as given on the same page. This was one James invented and we left it approximately as given. We spent a long while avoiding this one because it looked scary, but actually rather enjoyed it when we got into it. James did give us a few extra pointers - perhaps we should have left these in.
10	Pictures	The idea was James' and we only modified the first two pictures (to hide Humphreys of course).
10	Number code	Our addition to help with the questions. Only one team noted that K = 7 (although out of context), everyone else went for a Caesar shift, in which they were well versed following on from Apophenia Island in 2020! There is a code on dcode.fr called K7, which we used as inspiration, but it is not a generally well used code so we were not really expecting anyone to find it.
11	Christmas card pictures	These were all from James and left exactly as they were. Most teams identified most of the pictures but a lot of the links to appropriate bands were missed. The final image, Kenneth Brannagh and Judi Dench in A Winter's Tale, was the one that most teams failed to get. As these were connected with a band or artist, rather than a song, Coldplay was the one we were looking for.
12	Christmas Pie	Inspired by James (his solution was 'IS NOT HERE DUAL', with the extra portion being 'KEY'. Apparently all would be made clear in some puzzles we were yet to see). We decided to re-use it as a red herring.
12	Departure board	Our addition which we thought was rather easy, however, it turned out there were a lot of possibilities for what to do with it, and teams really over-complicated this one. If doing something similar then some indication of a source reference would be useful. The first message was considered to be rather ambiguous in stating AS DECIMAL, so some instruction towards the source for the longitudes may have been a better hint.
13	AC's weather briefs	This was one from James who was not really a fan of ASCII so the fact that this could be cracked using ASCII would have been a disappointment!
13	Cold themed pictures	James devised the idea, although his version did not have an acrostic, so we changed several pictures here. The acrostic addition was a clue to help with the number puzzle on the page.

		This page was intended as the last page of the hunt, but we decided the photo trail was a better final page.
13	Santa's Workshop	The idea was James' but we changed the answer to help solve the pictures below. For the text wrap to work the number of letters in the message had to be a prime number.
13	GLACIAL puzzle	This was James' puzzle, we merely changed two of the Twelve Days of Christmas parodies and added Humphrey instead of The Count. Perhaps The Count would have been a better clue for what to do!
13	Prime multiplications	We added this as a quick way to hide an instruction to find the treasure, and thought anyone with a maths brain would get this no problem without even needing to do any of the rest of the page. However, we were surprised to see teams were really stumped by it, and only really solved it fairly late in the hunt. Seven teams correctly got THIRTEEN STEPS. The thermometer at -18.3 was considered to be not very clear by some teams.
14	Photo trail	James devised the trail and chose most of the pictures. We modified some of them to use a broader range of sources. The strange sentence was James' idea, we tweaked it a little to ensure that MALI spanned two words (rather than just the start of one). We also added the numbers and devised the historical meridians code, although many teams failed to spot this until the New Year hint was released. James had used a different idea with instructions to GO DOWN ROAD TO WARE. This sounded ideal, until he later pointed out that it also rearranged to WRONG AT A WOOD REDO. James was fond of red herrings and misdirection - this appeared to be one more.
Hints	24th Dec	Thankfully we still had one day of Advent left so made the most of it. The plane ticket clue helped several teams to solve the departure board although it just acted as a confirmer for other teams. We learned to always check source images carefully, and didn't appreciate the full extent or range of barcodes (which many teams seemed to be, unexpectedly, expert in).
Hints	New Year's Poem	We were getting a bit worried that no teams had found the treasure and came up with the poem to drop some really heavy hints to help solve page 14, give some general encouragement, and advise how to arrange the words in the hex grid (which was not impossible!). It seemed to work as the same day two teams located the treasure, although we don't know if the hint helped or this was just a coincidence.