

# Another Fine Mess

## Pablo's Armchair Treasure Hunt 2017

This is the solution and marking scheme for the 2017 Armchair Treasure Hunt, set by the 'Bruce Hindsight' team. The Hunt began on 15 December 2017, and ended on 15 January 2018. Teams must mark their own solutions, following the instructions given here, and submit their marks by 31 January 2018. The setters will announce the results and award the prizes at a social gathering for all teams on 6 March 2018.

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## Marking instructions

You must mark your own solution document. The setters have provided a link to a blank marking spreadsheet on Google Docs. Make a copy of this spreadsheet (using File → Make a copy...) that you can edit. Fill in your copy, following the instructions below. Get a shareable link to your copy (using File → Share...) and e-mail the link to [setters@ath2017.org](mailto:setters@ath2017.org) by 12:00 UTC on 31 January 2018. The setters may re-mark your solution and adjust your score, and their decision is final.

The criteria for each mark are followed by a letter and a number in parentheses, for example:

The picture at the bottom right of page 4 is shaped like a domino (D1).

If this appears in your solution, award yourself the mark by putting the page number in the appropriate cell in column A in the marking spreadsheet. For example, if this is on page 5 in your solution, put the number 5 in the cell next to mark D1.<sup>1</sup> If this appears on multiple pages in your solution, pick one. Row 1 of the spreadsheet will show your total marks, out of a maximum of 467. If you have any doubts or comments about a mark, you can request a ruling from the setters by putting a query in the appropriate cell in column D in the spreadsheet.

If part of the criteria is **emphasized in bold**, then that part must occur in your solution exactly as given (allowing for reasonable spelling variation). Other parts of the criteria may be paraphrased in your solution and you can still award yourself the mark.

There may be alternative answers, for example:

**Heracles** (or **Hercules**) (P22)

‘Eton Mess’ is a kind of dessert; ‘The Eton Rifles’ is a single by The Jam, and ‘jam’ is a synonym for ‘mess’ (Q125 for either)

In these cases either version of the answer (or both) gets the mark.

Anything in this document not followed by a mark in parentheses is for information only, and we have not allocated any marks for it.

You may propose up to five ‘write-in’ marks, Z1–Z5, for things you included in your solution that are not mentioned in this document, and which you feel are deserving of credit. They may be alternative solutions or identifications, links that we had not spotted, or even—if very convincing—things that should have been in the Hunt if we had thought of them. We may award you these marks, or not, at our discretion.

## Hunt structure

In the flowchart on page [3], blue boxes correspond to puzzle elements supplied by the hunt, yellow boxes are solution steps, and red boxes are results and messages. Dotted lines are hints that might be bypassed by insightful solvers.

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<sup>1</sup> If your solution consists of multiple documents, then choose something sensible to put in column A, for example “hexes-5” if the answer appears on page 5 of the “hexes” document.



## General (G1–G10)

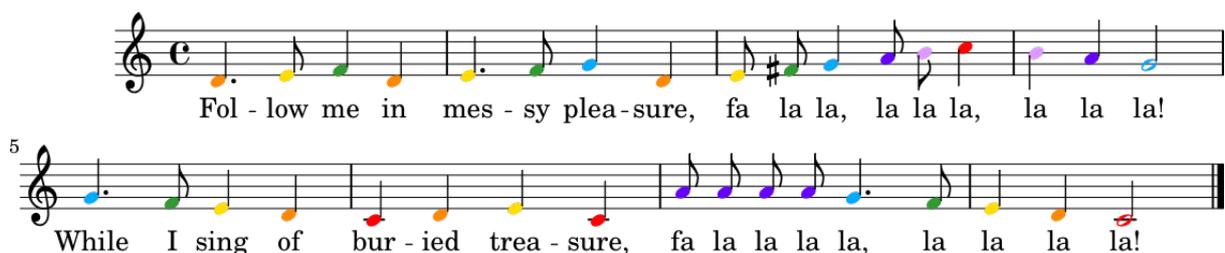
The theme of the Hunt is **mess** (G1). Key characters and events are the astronomer Charles **Messier** (G2), the composer Olivier **Messiaen** (G3), the footballer Lionel **Messi** (G4), **Mr Messy** (G5) from the book by Roger Hargreaves, and the battle of **Messines** (G6). (Any mention in a solution document is sufficient for G2–G6.) There are many **anagrams**, which are a type of mess (G7). The layout of the Hunt itself is a mess (G8). The treasure was found by making things neat and tidy (G9), for example by solving anagrams and putting objects in order. The treasure was hidden in Conyfield Wood near **Messing** (G10) in Essex.

## Teaser poster (T1–T17)

The central figure is astronomer Charles **Messier** (T1), based on a portrait by Nicolas Ansi-aume and displaying the *croix de chevalier de la Légion d'honneur* awarded by Napoléon (see Q53). He is wearing rainbow-striped football boots similar to ones worn by Lionel **Messi** (T2). He is riding a **Messerschmitt KR200** (or *Kabinenroller*) bubble car (T3). Messerschmitt is better known for manufacturing aircraft, so the car has been fitted with wings, tail fin and machine guns, similarly to one modified by Messerschmitt enthusiast Dave Blackmore. As in his astronomical career, Messier is chasing a **comet** (T4). He discovered thirteen comets (see C2) and was nicknamed *ferret des comètes* ('ferret of comets').

The octagonal tower in the background, and the decorative frieze at the bottom, resemble features of the **Hôtel** (or **Musée**) **de Cluny** (T5) in Paris (now the [Musée national du Moyen Âge](#)). Here Messier made astronomical observations (T6). On top of the tower, where Messier's observatory formerly stood, is a pot of treasure. The vaulted dome above the tower, and the oval stained-glass windows showing a green-winged angel carrying a portative organ, resemble features of the **Église de la Sainte-Trinité** in Paris (T7) where Olivier **Messiaen** was organist (T8) from 1931 until his death in 1992.

The big stained-glass windows consist of lights painted with the seven rainbow colours (T9). These colours can be interpreted as musical pitches using the correspondence **red=do** — **orange=re** — **yellow=mi** — **green=fa** — **blue=sol** — **indigo=la** — **violet=ti** (T10), and the heights of the lights as note durations (T11). Taking the panels from left to right and top to bottom yields an extract of music from the Christmas carol '**Deck the Hall** (or **Halls**)' (T12). The text at top left indicates that we are to sing **verse 2, lines 3–4** (T13). The usual words are "Follow me in merry measure ... While I sing of beauty's treasure", but three textual emendations are indicated: *merry* → **messy** (T14); *measure* → **pleasure** (T15); and *beauty's* → **buried** (T16). A plus sign in the second column indicates a sharp (or natural, depending on the key signature) note (T17). Putting this together yields the theme song for this year's treasure hunt:



There are many versions and arrangements of this carol. The accidental may be omitted, or there may be fewer occurrences of “la”, or “Christmas” or “Yuletide” may appear instead of “beauty’s”. The tune and emendations identify our chosen version.

## Picture quiz (Q1–Q131)

Each hexagonal picture has an associated Messier object (see A3); an identity, whose initial letter is used in various puzzles (see S3, A16, F12 and Y5); and a connection to the theme of the hunt.

P	Obj	Identity	Thematic connection
1	M31	<b>Vacuum cleaner</b> (Q1)	“Vacuum Cleaner Galaxy” is a name for Messier 109 (Q2)
	M32	<b><i>Eurotamandua</i></b> (Q3)	Genus of fossil pangolins discovered at <b>Messel</b> Pit (Q4) in Germany
	M34	<b>Rainbow</b> (Q5)	From children’s TV programme <b><i>Messy Goes To OKIDO</i></b> (Q6). Rainbow colours correspond to the notes of the major scale throughout the hunt (see T10)
	M76	Lionel <b>Messi</b> (Q7)	His name starts <i>Mess-</i> ; hero of the football puzzle (Q8 for either)
	M110	<b>Sigmundskron Castle</b> (Q9), South Tyrol	Home of the <b>Messner Mountain Museum</b> (Q10)
2	M40	<b>Hornet</b> (Q11)	“Hornisse” (hornet) was a codename for the Messerschmitt Me 410 fighter-bomber (Q12)
	M51	<b>Omega</b> (Q13) from the <i>Doctor Who</i> serial “The Three Doctors”	“Omega Nebula” is a name for Messier 17 (Q14)
	M97	<b>Cress</b> (Q15)	If ‘CR’ is changed to ‘M’, the result is ‘MESS’ (Q16). The cress is pictured on the vicar’s chair at All Saints’ Church, Messing, which “was the personal property of the Revd. R. T. Crawley, who was for many years rector of Cressing. It was presented to this church by the Misses Crawley when they came to live at Harborough Hall in 1907 and the ‘CR’ was changed to ‘M’ on the inscription” [from ‘A walk around Messing Church’ by Revd. Martin Clarke]
			
M101	<b>Knife-rests</b> (Q17)	“ <b>Messerbänken</b> ” or “ <b>Messerbänkchen</b> ” in German (Q18 for either)	
M106	General Sir Herbert <b>Plumer</b> (Q19), from a portrait by Francis Dodd	Commander of the British forces at the battle of Messines (Q20)	

P	Obj	Identity	Thematic connection
2	M108	<b>Elephant</b> (Q21), from a stained-glass window by Abraham van Linge at Lydiard House, Swindon	Abraham van Linge also painted a window at All Saints' Church, Messing (Q22); see page [9]
	M109	<b>Sombrero</b> (Q23)	"Sombrero Galaxy" is a name for Messier 104 (Q24)
3	M1	Saint <b>Francis</b> of Assisi (Q25), played by Bradford Dillman, from the 1961 film <i>Francis of Assisi</i>	<i><b>Saint-François d'Assise</b></i> is an opera by Olivier Messiaen (Q26)
	M35	Ruins of <b>Ypres</b> (Q27), 1917	Messines was in the Ypres salient in World War I; the battle of Messines was a prelude to the 3rd battle of Ypres (Q28 for either)
	M36	The <b>evil eye</b> (Q29), in a traditional representation used in Turkish <i>nazar</i> charms	"Evil Eye Galaxy" is a name for Messier 64 (Q30)
	M37	Andrés <b>Iniesta</b> (Q31)	Team-mate of Lionel Messi at F.C. Barcelona (Q32)
	M38	Olga <b>García</b> (Q33)	Like Lionel Messi, plays for F.C. Barcelona (Q34). She plays at number 10 for Barcelona women, the same number that Messi plays at for Barcelona men (Q35). The picture was taken when she was playing at her former number (20) but only the '0' is visible on her kit
4	M58	Shield of the County of <b>Salm-Salm</b> (Q36) in the Holy Roman Empire	Charles Messier was born in Salm-Salm (Q37). He was born in Badonviller (or Badenweiler) in 1730, when parts of it belonged to Salm-Salm and the remainder to the Duchy of Lorraine. Messier was born at 16 rue du Maréchal Foch, where he is <a href="#">commemorated by a plaque</a> . We believe that this house was in Salm-Salm in 1730, but this is not easy to establish, as Badonviller was partitioned house by house in a deed of 1598, and the deed lists the houses by their owners, thus one part consisted of "la boutique d'Isaac Geoffroy, la maison de Paulus, de Namur, de Jean Dubois" and so on. We have relied on an anecdote in the <i>Mémoires de l'Académie des Sciences</i> (1772) which mentions that Messier was "né sujet du prince" (born a subject of the prince), referring to Prince Louis Otto, Count of Salm-Salm
	M59	The song of the <b>yellowhammer</b> (Q38), "little bit of bread and no cheese" from Messiaen's <i>Méditations sur le mystère de la Sainte Trinité</i> , VIII mm. 93–4	Olivier Messiaen included the yellowhammer's song in <i>Méditations sur le mystère de la Sainte Trinité</i> ; <i>Catalogue d'oiseaux</i> ; <i>Chronochromie</i> ; and <i>La fauvette des jardins</i> (Q39 for any)
	M60	<b>Ring</b> (Q40)	"Ring Nebula" is a name for Messier 57 (Q41)
	M84	Lia <b>Halloran</b> (Q42)	Lia Halloran's artwork <i><b>Deep Sky Companion</b></i> consists of images of the 110 Messier objects (Q43)

P	Obj	Identity	Thematic connection
4	M86	<b>Treasure</b> chest (Q44)	The pictured chest is found in All Saints' Church, Messing (Q45). "The large medieval chest on the south side, near the transept, is a 14th century 'dig-out' chest, bound with iron, and secured by 3 large locks, to which 3 keys belong, all different, and formerly held by the vicar and 2 churchwardens. The important parish records and valuables were kept here. This chest has a romantic history, for during the Civil War, Messing, staying loyal to King Charles I, preserved the church treasures by putting them in this chest and placing it in the church vault." [from 'A walk around Messing Church' by Revd. Martin Clarke]
	M87	<b>Undermine</b> (Q46), a character in the <i>Transformers</i> franchise	Undermining is what took place at the battle of Messines (Q47)
	M89	Part of the coat of arms of <b>Rosario</b> (Q48) in Argentina	Birthplace of Lionel Messi (Q49)
	M90	<b>Nineveh</b> (Q50) from a stained-glass window by Abraham van Linge in Christ Church, Oxford	Abraham van Linge also painted a window at All Saints' Church, Messing (Q51); see page [9]
5	M10	<b>Napoleon</b> (Q52), from the 1954 animated film <i>Animal Farm</i>	Charles Messier was awarded the <i>croix de chevalier de la Légion d'honneur</i> by the Emperor Napoléon; he later published a memoir, 1769: <i>Grande comète qui a paru à la naissance de Napoléon-le-Grand</i> (Q53 for either). The memoir connected the Great Comet of 1769 to the birth of Napoléon, an absurd piece of flattery for which Messier was ridiculed
	M12	<b>Eclairs</b> (Q54)	<i>Éclairs sur l'au-delà...</i> (Lightning over the beyond...) is a composition by Olivier Messiaen (Q55)
	M14	<b>Swallow</b> (Q56)	"Schwalbe" (swallow) was a codename for the Messerschmitt Me 262 jet fighter (Q57)
	M107	Lunar crater <b>Messier</b> (Q58)	Named after Charles Messier (Q59)
6	M41	Mr <b>Tidy</b> (Q60)	From <i>Mr Messy</i> (Q61) by Roger Hargreaves; the picture is from the <i>Mr Men</i> TV series
	M46	Caroline <b>Herschel</b> (Q62), from a lithograph by A. Diethel	Herschel made an independent discovery of Messier 110 (Q63) on 27 August 1783. In the picture she is not drinking tea, but administering lubricant to the telescope mirror being polished by her brother William
	M47	<b>Beehive</b> (Q64)	"Beehive cluster" is a name for Messier 44 (Q65)
	M93	Turanga <b>Leela</b> (Q66), from the television series <i>Futurama</i>	<i>Turangalila-Symphonie</i> is a composition by Olivier Messiaen (Q67)
7	M27	Valeria <b>Messalina</b> (Q68), played by Sheila White, from the television series <i>I, Claudius</i>	Her name starts <i>Mess-</i> (Q69)
	M29	<b>Dipstick</b> (Q70)	" <b>Messstab</b> " or " <b>Meßstab</b> " in German (Q71 for either)
	M56	<b>Inworth</b> (Q72) village sign	Part of <b>Messing-cum-Inworth</b> civil parish (Q73)

P	Obj	Identity	Thematic connection
7	M57	<b>Nebula</b> (Q74), played by Gina Torres, from the television series <i>Hercules: the Legendary Journeys</i>	The Messier objects include various nebulas (Q75). A dashed grey line connects this picture to a postcard containing a message from Hercules to Iolaus (see P22–P23). The nature of the connection is indicated by a small picture of a television: Hercules and Iolaus appear with Nebula in the television series
8	M8	Madame <b>Adolphine</b> (Q76), from the comic book <i>Madame Adolphine</i> by Peyo	“Adolphine” was a name for the Messerschmitt Me 261 maritime reconnaissance plane (Q77). Note that the character in the picture is actually a robot duplicate of Madame Adolphine, but the duplicate is known by the same name as the original
	M20	Jeanne <b>Loriod</b> (Q78)	Virtuoso performer of Olivier Messiaen’s works for the ondes Martenot; sister of Yvonne Loriod, Messiaen’s second wife (Q79 for either)
	M21	<b>Allaeochelys</b> (Q80)	Genus of fossil turtles discovered at <b>Messel Pit</b> (Q81) in Germany
	M22	<b>Caterpillar</b> (Q82) 973D track type loader	“Caterpillar” was the name of a mine at the battle of Messines (Q83)
	M28	<b>Iceni</b> (Q84) faction icon from the game <i>Total War: Rome II</i>	The Iceni were defeated by the Romans at ‘the Rampart’ near Messing in Essex (Q85) in AD 61, according to local folklore, though this theory is not favoured by historians
	M54	<b>Xylophone</b> (Q86)	Olivier Messiaen was synaesthetic and saw music as colour; a correspondence between rainbow colours and notes of the major scale is used throughout the hunt (Q87 for either). A dashed grey line connects this picture to the Syria outline, one of the places where the correspondence is used (see F11)
	M69	<b>Ondes</b> (or <b>ondium</b> ) <b>Martenot</b> (or <b>musicales</b> ) (Q88)	Olivier Messiaen composed many pieces for this instrument (Q89)
	M70	<b>Whirlpool</b> (Q90)	“Whirlpool Galaxy” is a name for Messier 51 (Q91)
9	M4	Álex de la <b>Iglesia</b> (Q92)	Directed the documentary film <i>Messi</i> (Q93), the poster for which can be seen behind him
	M6	Mr <b>Neat</b> (Q94)	From <i>Mr Messy</i> (Q95) by Roger Hargreaves (the picture is from the <i>Mr Men</i> TV series)
	M7	Pound note issued by <b>Dumbell’s</b> Banking Company (Q96), Isle of Man	“Dumbbell Nebula” is a name for Messier 27 (Q97)
	M19	Entrance to <b>Peckham Rye</b> (Q98) station on Rye Lane, London	“Peckham” was the name of two mines at the battle of Messines (Q99)
	M62	<b>Island of Ireland Peace Park</b> (Q100)	War cemetery including graves of Irish soldiers killed at the battle of Messines (Q101), near Mesen in Belgium.

P	Obj	Identity	Thematic connection
9	M80	Aureus depicting the Roman Emperor <b>Claudius</b> (Q102)	Claudius was married to Valeria Messalina (see Q68); a temple was dedicated to him at Camulodunum (modern Colchester), about 15 km from the treasure (Q103 for either). Lettering on the coin reads TI[BERIUS] CLAUD[IUS] CAESAR AUG[USTUS] P[ONTIFEX] M[AXIMUS] TR[IBUNICIA] P[OTESTAS] VIII IMP[ERATOR] XVI
10	M16	<b>Swan</b> (Q104)	“Swan Nebula” is a name for Messier 17 (Q105)
	M17	Saint <b>Eligius</b> (Q106), from an engraving attributed to the master of Balaam	One of the mines at the battle of Messines was at the village of St Eloi (Q107), now Sint-Elooi in Belgium, named after Eligius
	M18	Iannis <b>Xenakis</b> (Q108)	Pupil of Olivier Messiaen (Q109)
	M24	Badge of the <b>Essex County Fire and Rescue Service</b> (Q110)	Messing is found in Essex; the treasure is also found in Essex; the Essex County Fire and Rescue Service headquarters are at Witham, about 8 km from the treasure (Q111 for any of these)
	M25	<b>Ascension Island</b> (Q112)	<i>L'ascension</i> is an orchestral suite by Olivier Messiaen (Q113)
11	M65	Lunar crater <b>Azophi</b> (Q114)	Named after Abd al-Rahman al-Sufi, who published a description of Messier 31 (Q115)
	M66	<b>Goal</b> (Q116) at Camp Nou, Barcelona	Lionel Messi's home ground; the picture is from a game against R.C.D. Espanyol on 9 September 2017, shortly before Messi scored a hat-trick goal (Q117 for either)
	M95	<b>Pleiades</b> (Q118), a supercomputer	“Pleiades” is the name of Messier 45 (Q119)
	M96	<b>Ida</b> (Q120), a specimen of <i>Darwinius masillae</i>	Fossil primate discovered at <b>Messel</b> Pit (Q121) in Germany
	M105	<b>Untidy</b> (Q122), a character from the <i>Yo-kai Watch</i> video game series	“Untidy” is a synonym of “ <b>messy</b> ” (Q123)
12	M30	<b>Eton Rifles</b> (Q124)	‘Eton Mess’ is a kind of dessert; ‘The Eton Rifles’ is a single by The Jam, and ‘jam’ is a synonym for ‘mess’ (Q125 for either)
	M72	<b>Fingerprint</b> (Q126)	One of the prints left by Mr Messy (Q127) in the book by Roger Hargreaves
	M73	<b>Rupprecht</b> (or <b>Rupert</b> ) (Q128 for either), Crown Prince of Bavaria, from a portrait by Leopold Schmutzler	Commander of the German forces at the battle of Messines (Q129)
	M75	<b>Ontario</b> (Q130)	“Ontario Farm” was the name of a mine at the battle of Messines (Q131)

The Abraham van Linge connection (see Q22, Q51) is that he painted a stained-glass window at All Saints' Church, Messing, depicting the Acts of Mercy (Matthew 25:35–6), and Saints Faith, Hope and Charity, shown on page [10].



## String puzzle (S1–S16)

As shown on page [11], the twelve pages of the hunt fit together (S1) so that the pink string traces a continuous path through all of the picture quiz hexagons, starting at the illustration of **Mr Messy** (S2) on page 2, and ending at the treasure chest on page 4.

Reading the initials from the picture quiz in order along the string yields the message:

**HAPPY (S3) XMAS (S4) EPIC (S5) NEW (S6) YEAR (S7) SORTIE (S8) FIXING (S9) MESS (S10) LUCK (S11) AND (S12) LOVE (S13) FROM (S14) BRUCE (S15) HINDSIGHT (S16)**

'Bruce Hindsight' is, of course, the team name of the setters.

1

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Never G5 Sorialism

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12

A.T.H. Scoreboard 2017  
Team 12  
Score 1/4 1/2 2/4 5 10

## Domino cipher (D1–D23)

The picture at the bottom right of page 4 is shaped like a domino (D1). On the left are three **popes** (D2), all of whom published official documents whose title included ‘domino’:

Pope	Document	Year
Nicholas IV (D3)	<i>Gaudemus in Domino</i> (D4), a papal bull	1291
Eugene (or Eugenius) IV (D5)	<i>Cantate Domino</i> (D6), a papal bull	1441
Paul VI (D7)	<i>Gaudete in Domino</i> (D8), an apostolic exhortation	1975

On the right is a picture of actor **Ken Stott** playing the lead character **Red Metcalfe** (D9 for either name) in the BBC TV series *Messiah* (D10), together with co-stars Helen McCrory, Neil Dudgeon, and Maxine Peake. Ken Stott also played the lead character in the ITV series *Rebus* (D11); the domino thus represents Alexander **Pope’s** poem ‘**Messiah**’ (D12) via a rebus. The poem’s subject is the Nativity and so it is seasonally thematic (D13).

The small grey rectangles correspond to the letters of the first line of the poem (D14), “Ye Nymphs of Solyma! begin the song”. The numbers on each domino specify a word and a letter within that word (D15), as indicated by the red domino with two and five spots, and the corresponding red rectangle on the fifth letter of the second word. Successive dominoes correspond to successive lines of the poem. Dominoes placed across the direction of movement represent the starts of words (D16). In line 20, ‘white-rob’d’ must be taken to be two separate words (as they are in some editions of the poem). The message deciphers as follows:

Domino	Line	Letter
2–5	Ye Nymphs of Solyma! begin the song:	H
6–2	To heav’nly themes sublimer strains belong.	E
6–3	The mossy fountains, and the sylvan shades,	L
4–1	The dreams of Pindus, and th’Aonian maids,	P
1–3	Delight no more—O Thou my voice inspire	L
3–4	Who touch’d Isaiah’s hallow’d lips with fire!	I
2–4	Rapt into future times, the bard begun:	O
6–6	A virgin shall conceive, a virgin bear a son!	N
2–2	From Jesse’s root behold a branch arise,	E
6–4	Whose sacred flow’r with fragrance fills the skies;	L
1–1	Th’æthereal spirit o’er its leaves shall move,	T
4–2	And on its top descends the mystic dove.	O
3–2	Ye Heav’ns! from high the dewy nectar pour,	R
4–4	And in soft silence shed the kindly show’r!	E
3–1	The sick and weak the healing plant shall aid,	A
1–2	From storms a shelter, and from heat a shade.	R

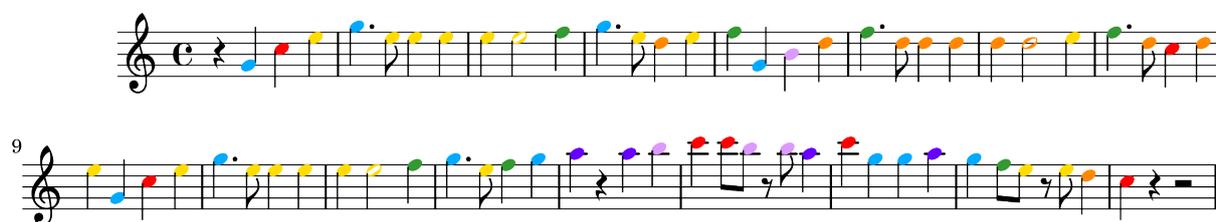
Domino	Line	Letter
2–4	All <b>cr</b> imes shall cease, and ancient fraud shall fail,	M
5–3	Returning Justice lift aloft her <b>r</b> e scale;	R
1–5	Peace <b>e</b> o'er the world her olive wand extend,	E
3–3	And white-rob' <b>b</b> 'd Innocence from Heav'n descend.	B
6–4	Swift fly the years, and rise <b>t</b> h'expected morn!	E
4–1	O spring to <b>l</b> ight, auspicious babe! be born.	L
3–6	See Nature hastes <b>s</b> her earliest wreaths to bring,	S

That is, **HELP** (D17) **LIONEL** (D18) **TO** (D19) **REARM** (D20) **REBELS** (D21). This alludes to a 2012 [news story](#) that a pattern of dribbling and passing by Lionel Messi and his Barcelona team-mates encoded instructions for smuggling arms to the Syrian rebels (D22). According to Addounia TV, the guns were to enter Syria at Homs (encoded by a pass from Iniesta to Messi), cross Syria on a route encoded by Messi's dribbling, and be delivered to the rebels at Al-Mayadin (encoded by the goal). The story provides clues for the Football puzzle (D23).

## Football puzzle (F1–F29)

When the twelve pages of the hunt are laid out according to the string puzzle (see S1), the outlines on pages 2, 6, 8, and 11 connect to form an outline map of **Syria** (F1). The hexagonal pictures must be fitted into this outline (F2) in such a way that adjacent edges are the same colour (F3). Lugs and holes on the hexagons indicate that they must not be rotated. The unique solution is given on page [14] (F4 for all hexagons in correct positions).

In accordance with the story that Lionel Messi encoded instructions for smuggling guns to the Syrian rebels in his football play (see D22), an AK-47 is pictured in silhouette at **Homs** near the border with Lebanon, where the guns supposedly entered the country (F5). The guns were to be transported to the town of **Al-Mayadin** (F6 for any reasonable spelling), which is labelled in Arabic on the map. In the solved jigsaw, Lionel Messi stands at the gun (F7), and the goal at Al-Mayadin (F8). A television suggests the theme tune to 'Match of the Day' (F9) by Barry Stoller. This tune yields a path from Messi to the goal (F10), shown on page [14]. The colours of the edges crossed, in order, spell out the tune (F11), with rainbow colours corresponding in order to notes of the major scale in the usual way (see T10):



Reading the initial letters from the picture quiz along the path reveals the message:

**EACH** (F12) **P** (F13) **IS** (F14) **MAP** (F15) **OF** (F16) **SKY** (F17) **EACH** (F18) **PIC** (F19) **IS** (F20) **MESSIER** (F21) **SO** (F22) **NUMBER** (F23) **IN** (F24) **A** (F25) **TIDY** (F26) **INCREASING** (F27) **ORDER** (F28)



The alternative reading **MESSIER'S** (F21) **O** (F22) is also acceptable, but misses the intended pun on *Messier* (in opposition to *tidy*). The message gives instructions for the Astronomy puzzle (F29).

## Astronomy puzzle (A1–A37)

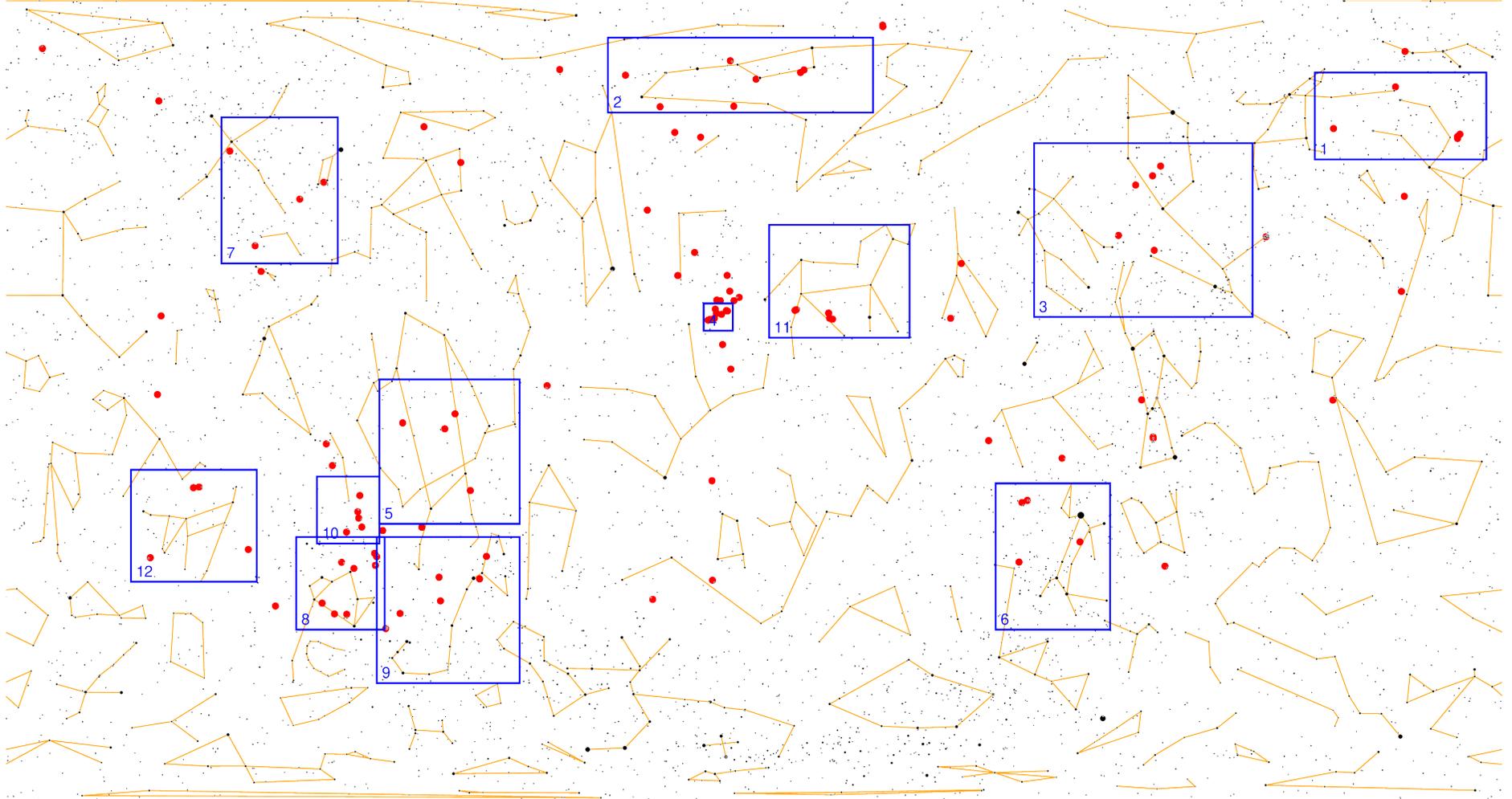
Each page represents a map of part of the sky (A1). Stars are shown as tea (or coffee) stains (A2), thematically since these are a form of mess. Each page is in an equirectangular projection with a different scale, and shows a selection of stars from the Yale Bright Star Catalog. The hexagons are placed on the locations of Messier objects (A3), but adjusted where necessary to avoid overlapping with each other. The map of the whole sky on page [16] shows each page of the hunt as a blue rectangle, and each Messier object as a red dot.

Page	Messier objects	Mark for all
1	M31, M32, M34, M76, M110	(A4)
2	M40, M51, M97, M101, M106, M108, M109	(A5)
3	M1, M35, M36, M37, M38	(A6)
4	M58, M59, M60, M84, M86, M87, M89, M90	(A7)
5	M10, M12, M14, M107	(A8)
6	M41, M46, M47, M93	(A9)
7	M27, M29, M56, M57	(A10)
8	M8, M20, M21, M22, M28, M54, M69, M70	(A11)
9	M4, M6, M7, M19, M62, M80	(A12)
10	M16, M17, M18, M24, M25	(A13)
11	M65, M66, M95, M96, M105	(A14)
12	M30, M72, M73, M75	(A15)

The initial letters from the picture quiz can be read in the order of these objects in the Messier Catalogue (A16). This yields a new message, which is an anagram (see G7) of the string message (see S3):

**FIND** (A17) **AN** (A18) **ESSEX** (A19) **PLACE** (A20) **AMID** (A21) **EVERY** (A22) **EIGHTH** (A23) **BOX** (A24) **IN** (A25) **SYRIA** (A26) **GO** (A27) **W** (A28) **FROM** (A29) **CH** (A30) **TURN** (A31) **L** (A32) **PICK** (A33) **UP** (A34) **MESS** (A35)

“Every eighth box in Syria” means every eighth letter in the message from the Football puzzle (see F12). This yields the word **MESSING** (A36), the name of a village in Essex (see G10). “Go W from Ch turn L” means “go west [on Kelvedon Road] from [All Saints’] Church; turn left [on School Lane]”. “Pick up Mess” means that solvers must pick up the directions given by the River (Mess) puzzle (A37).



## Heraldry puzzle (H1–H45)

The map on page 5 is of **France** (H1). Surrounding it are 57 heraldic fragments, a mixture of escutcheons and charges, each associated with a letter. Reading every other letter clockwise spells out the message **HERALDRY OF GAUL BEGOT TOO FROM ARMORIAL FRAGMENTS ROUND PERIMETER** (H2). The version of this message with **BE GOT**, and the version starting **FROM ARMORIAL ...** are also acceptable.

As this message (somewhat cryptically) indicates, solvers must combine the heraldic fragments into the shields of the twelve places marked on the map (H3). The letters associated with the heraldic fragments of each shield form a word, phrase or abbreviation (H4), starting with the escutcheon and then proceeding from top to bottom and left to right across the shield (H5). These words are clues to the Postcard quiz (H6).

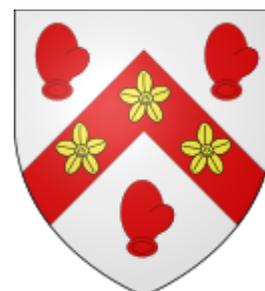
Places marked with a blue square have names starting with *Mess-* (H7). Places marked with a white ellipse are places where Olivier Messiaen lived as a child (H8). The ellipse is associated with Messiaen because it has the shape of a musical note (H9). Places marked with a red hexagon are the birthplaces of discoverers of Messier objects (H10). Hexagons are associated with Messier objects because that is their role in the Astronomy puzzle (H11). The colours blue, white and red correspond to the colours on the French flag (H12). A mine on the map is a graphic from the game **Minesweeper** (H13) and marks the village of Mesen in Belgium, site of the battle of **Messines** (H14).

There is one point of difficulty due to the two identical *escutcheons gules*, but consideration of the postcard messages (see P12 and P18) shows that the clues must be 'MP' and 'EARL' and not 'EP' and 'MARL'.

Shield	Place	Clue	Thematic connection
	<b>Messei</b> (H15), Orne	<b>TOY</b> (H16)	Starts with <i>Mess-</i>
	<b>Messery</b> (H17), Haute-Savoie	<b>DOM</b> (H18)	Starts with <i>Mess-</i>
	<b>Messigny-et-Vantoux</b> (H19), Côte-d'Or	<b>MGR</b> (H20)	Starts with <i>Mess-</i>
	<b>Messimy</b> (H21), Rhône	<b>OFF GUARD</b> (H22)	Starts with <i>Mess-</i>

Shield	Place	Clue	Thematic connection
	<b>Coutances</b> (H23), Manche	<b>FLIER</b> (H24)	Birthplace of Guillaume <b>Le Gentil</b> (H25), discoverer of M32
	<b>Belgentier</b> (H26), Var	<b>MP</b> (H27)	Birthplace of Nicolas-Claude de <b>Peiresc</b> (H28), discoverer of M42
	<b>Rumigny</b> (H29), Ardennes	<b>GR</b> (H30)	Birthplace of Nicolas Louis de <b>Lacaille</b> (H31), discoverer of M55 and M83
	<b>Laon</b> (H32), Aisne	<b>OTTOMAN</b> (H33)	Birthplace of Pierre <b>Méchain</b> (H34), discoverer of M63, M72, M74–9, M85, M94–109
	<b>Avignon</b> (H35), Vaucluse	<b>EARL</b> (H36)	Birthplace of Olivier Messiaen, 1908
	<b>Ambert</b> (H37), Puy-de- Dôme	<b>ALIEN</b> (H38)	Home of Olivier Messiaen, 1908–14
	<b>Grenoble</b> (H39), Isère	<b>HERO</b> (H40)	Home of Olivier Messiaen, 1914–18
	<b>Nantes</b> (H41), Loire- Atlantique	<b>BRO</b> (H42)	Home of Olivier Messiaen, 1918–19

After assembling the twelve shields, eight unused heraldic fragments remain (H43): an *escutcheon argent*; a *chevron gules*; three *sinister gauntlets gules*; and three *cinquefoils or*. These may be combined in only one way (according to the ‘rule of tincture’) to make the shield shown at right. This is the shield of **Messing** in Essex (H44), and of the Chibborne family who held the manor there in the 17th and 18th centuries. It can be seen on the wall of the Messing village hall, and on the village sign by All Saints’ Church, pictured on page [19]. The letters associated with the Messing shield spell **TREASURE** (H45) (see G10).





## Minesweeper (M1–M23)

The grid on page 7 is a position in the game **Minesweeper** (M1) with 9 hidden mines indicated by the number at top left (M2). Minesweeper has a timer at top right, and the number 310 that appears here corresponds to the time (**3:10** a.m. on 7 June 1917) at which twenty large mines were detonated at the start of the battle of Messines (M3). In accordance with the rules of Minesweeper, the numbers in the grid are counts of mines in adjacent squares (orthogonally and diagonally). The unique solution is given at right (M4 for all correct mine positions).



The map on page 6 shows part of the battlefield at **Messines** (M5). The letters overlaid on the map correspond to the grid squares in the Minesweeper puzzle (M6) and if the locations of the mines are read from top to bottom they spell **GAY GOPHER**<sup>2</sup> (M7). This is an anagram of **GEOGRAPHY** (M8) and alludes to the quotation “Gentlemen, I don’t know whether we are going to make history tomorrow, but at any rate we shall **change geography**” (M9) which was said by General Sir Charles Harington to the press on the eve of the attack.<sup>3</sup>

The map is connected by a dashed grey line to the hexagon on page 8 corresponding to Messier 20, the **Trifid Nebula** (M10). The unused letters on the map form a ciphertext (M11)

<sup>2</sup> The ‘Bruce Hindsight’ team captain writes, “One solver wrote to express a concern that GAY GOPHER might express a homophobic slur. I came up with this anagram and neither intended nor was aware of such a meaning. (I’m gay myself.) In puzzle terms, the phrase has no significance apart from being an anagram of GEOGRAPHY.”

<sup>3</sup> According to Neville Lytton (1921), *The Press and the General Staff*, London: Collins, p. 97. There are several versions of the quote in circulation, but Lytton was the oldest source we could find, and his version seems the most likely to be the original.

in the **Trifid cipher** (M12) invented by Félix Delastelle. The key to the cipher is **GAY GOPHER** (M13) as indicated by the small icon of a key with a mine replacing the bow. Deciphering proceeds as follows, in groups of 5 letters:

AATSD CLEAJ ABRND ON+AB GCKPF AFSIA DZXGZ TOFXF CQXUJ EHETK UQQUL  
 11211 21123 11213 12123 11121 11221 21233 31312 21131 13112 32131  
 23133 11311 31322 33331 12231 33122 23311 12133 13313 31313 13113  
 12212 12222 33212 12133 22213 21112 11332 31213 21222 13223 21231  
**ORDER CARDS BYMOV EMENT APPLY RECIP IENTS TOSEN DERSR ETRAN SLATE**

The plaintext is thus:

**ORDER** (M14) **CARDS** (M15) **BY** (M16) **MOVEMENT** (M17) **APPLY** (M18) **RECIPIENTS** (M19) **TO** (M20) **SENDERS** (M21) **RETRANSLATE** (M22)

This contains clues for the Interversion puzzle (M23).

## Postcard quiz (P1–P39)

Each page shows the two sides of a postcard (P1). The obverse (picture) sides are used in the Interversion puzzle (see I1). The reverse sides contain imagined **messages** (P2) sent or spoken by one historical or fictional character to another, from which the identities of the sender and recipient can be deduced. Additional clues are available via the Heraldry puzzle (see H6) and in one case the Picture quiz (see Q75). The postmark is either square, hexagonal, or elliptical: this corresponds to the shape of the map marker for the place that supplies the clue (P3) in the Heraldry puzzle (see H7, H8, H10). Three clues are relevant to multiple messages: OTTOMAN also (tenuously) to page 1, EARL also to page 9, and BRO also to page 12, but in each case the postmark indicates the correct assignment.

P	Sender	Recipient	Clue
1	Pêro da <b>Covilhã</b> (P4 for any reasonable spelling)	Empress <b>Eleni</b> of Ethiopia (P5)	<b>DOM</b> (P6)
	At a time of constant threat of invasion by the Ottomans, Covilhã advised Eleni to send an envoy to request help from his native Portugal. Though accorded high status in Ethiopia, Covilhã was held prisoner and never allowed to return to Portugal as he wished. We have not seen it stated that he proposed himself as the envoy, but one imagines he did. Eleni, then governing as regent for her grandson Dawit, sent Mateus the Armenian as her envoy. It took ten years for Mateus to get to Portugal and a Portuguese mission to get back, offering the requested help. But by then Eleni was dead and Dawit rejected their help, only to be overrun soon after by the Ottomans.		
2	Amelia <b>Earhart</b> (P7)	Gene <b>Vidal</b> (P8)	<b>FLIER</b> (P9)
	When Earhart was planning her solo circumnavigation of the globe, it was Vidal (her long-time collaborator, friend, and probably romantic interest) who suggested Howland Island as a possible landing site during the Pacific crossing. A landing strip was built there but Earhart's plane disappeared on the flight to Howland.		
3	Nancy <b>Astor</b> (P10)	Joachim von <b>Ribbentrop</b> (P11)	<b>MP</b> (P12)
	Apart from "You can tell him from me", Astor really did say this to Ribbentrop, who as German ambassador would have been well positioned to pass the message on. Astor was the first woman elected to parliament to take her seat there.		

<b>P</b>	<b>Sender</b>	<b>Recipient</b>	<b>Clue</b>
4	<b>Bharata</b> (P13)	<b>Rama</b> (P14)	<b>BRO</b> (P15)
	In the <i>Ramayana</i> , Rama, the rightful heir to the throne, has been banished, but his brother Bharata, rather than take the throne for himself, begs him to return and rule. Dutiful to the terms of the banishment, Rama refuses to return until it is over. Bharata makes Rama promise to return as soon as the term is up, swears to immolate himself if not, and takes Rama's sandals and puts them at the foot of the throne to signify meanwhile that he is governing in Rama's place.		
5	Robert Dudley, Earl of <b>Leicester</b> (P16)	Sir Philip <b>Sidney</b> (P17)	<b>EARL</b> (P18)
	Leicester was the English commander at the battle of Zutphen (1586), where his nephew, the soldier and poet Sir Philip Sidney, was fatally wounded. As he lay dying, Sidney thirsted, but gave his water to another soldier with the words, "Thy necessity is yet greater than mine." Leicester was distraught by his death, and wrote to a friend, "If I could buy his life with all I have to my shirt, I would give it."		
6	<b>Roo</b> (P19)	<b>Eeyore</b> (P20)	<b>TOY</b> (P21)
	In <i>Winnie the Pooh</i> by A. A. Milne, on an Expedition [sic] to the North Pole, Roo falls into the water. Eeyore dangles his tail in to help Roo climb out, and gets wet and cold as a result. But Roo instead climbs up a pole found by Pooh, which, all realise, was the very North Pole they were seeking.		
7	<b>Heracles</b> (or <b>Hercules</b> ) (P22)	<b>Iolaus</b> (P23)	<b>HERO</b> (P24)
	Heracles' second task was to slay the many-headed Lernaean Hydra (the first task was a mere lion, admittedly the famously savage Nemean one). Every time he cut off a head, two grew in its place, so his nephew Iolaus helped by holding a flaming torch to each stump to prevent the heads growing back.		
8	<b>Elliott</b> (P25)	<b>Tyler</b> (P26)	<b>ALIEN</b> (P27)
	In <i>E.T. the Extra-Terrestrial</i> (1982), Elliott, the main character, has made friends with a small extra-terrestrial space traveller. Tyler, a friend of his older brother, mocks him in the playground, asking "Hey Elliott, where's your goblin?"		
9	Earl Joseph "J.R." <b>Smith</b> III (P28)	President Barack <b>Obama</b> (P29)	<b>OFF GUARD</b> (P30)
	After the Cleveland Cavaliers won the NBA finals in 2016, Smith, who played at the 'off guard' position, was often seen celebrating topless. In a call to the Cavs' coach Tyrone Lue congratulating him on the team's performance, Obama invited the team to the White House, but added, "Tell J.R. and everybody to put on a shirt, though. You can't be just walking around without a shirt for, like, a whole week .... Come on, man!"		
10	Albert <b>Einstein</b> (P31)	Emmy <b>Noether</b> (P32)	<b>GR</b> (P33)
	In Einstein's obituary notice of Noether, he remarked, "Pure mathematics is, in its way, the poetry of logical ideas," and called her "the most significant creative mathematical genius thus far produced since the higher education of women began". Her work on invariants led to her breakthrough discovery in general relativity ('GR') that symmetries give rise to conservation laws. She sent her seminal paper to Einstein; we don't know if he replied, but he expressed great admiration for it in a letter the next day to Hilbert.		
11	Monsignor José Sebastián <b>Laboa</b> (P34)	General Manuel <b>Noriega</b> (P35)	<b>MGR</b> (P36)
	When Noriega was toppled as dictator of Panama by a US military invasion, he took refuge in the Papal Nunciature, the embassy of the Vatican. Monsignor ('MGR') Laboa, according to his own subsequent account, told Noriega he was entitled to stay as long as he liked but tried to persuade him to surrender. Meanwhile, though diplomatic immunity prevented the Americans storming the embassy, they surrounded it and played loud heavy metal music for some time in an effort to break Noriega's resolve.		

P	Sender	Recipient	Clue
12	Sultan <b>Bayezid</b> II (P37 for any reasonable spelling)	Pope <b>Innocent</b> VIII (P38)	<b>OTTOMAN</b> (P39)
<p>In 1481, Bayezid defeated his brother Cem in a dispute over the succession to the Ottoman Empire. Cem sought refuge on Rhodes with the Knights of St John, but the latter cut a deal with Bayezid to capture Cem in return for an annual fee of 40,000 ducats for his maintenance. This valuable prisoner was later transferred to the custody of the Pope in Rome. As well as the ransom, Innocent used the threat of releasing Cem to check Bayezid's ambitions in Europe, including against Venice.</p>			

## Interversion puzzle (I1–I26)

The obverse (picture) sides of the postcards are clues to the twelve movements of Olivier Messiaen's work *Des canyons aux étoiles...* (From the canyons to the stars...) (I1). The following table gives the Page number, movement number, movement name, picture connection, postcard **Sender** and **Recipient** initials (see P4–P38) for each page of the hunt:

P	Movement	Picture connection	S	R
1	7 <i>Bryce Canyon et les rochers rouge-orange</i> (Bryce Canyon and the red-orange rocks)	Part of Bryce Canyon (I2), Utah	C	E
2	6 <i>Appel interstellaire</i> (Interstellar call)	Dr. Ellie Arroway, played by Jodie Foster, in the 1997 film <i>Contact</i> . The film depicts interstellar communication (I3)	E	V
3	8 <i>Les ressuscités et le chant de l'étoile Aldebaran</i> (The resurrected and the song of the star Aldebaran)	Postcard shows a pair of musical notes, which are located under the stain corresponding to the star Aldebaran (I4)	A	R
4	5 <i>Cedar Breaks et le don de crainte</i> (Cedar Breaks and the gift of awe)	A Roman centurion, played by John Wayne, in the 1965 film <i>The Greatest Story Ever Told</i> . A well-known (but likely apocryphal) story says that director George Stevens was not satisfied with Wayne's delivery of his (only) line, "Truly this man was the son of God," and asked him to "say it with awe." In the next take, Wayne said, "Aw, truly this man was the son of God." (I5 for any version of this story)	B	R
5	9 <i>Le moqueur polyglotte</i> (The mockingbird)	Atticus Finch, played by Gregory Peck, in the 1962 film <i>To Kill a Mockingbird</i> (I6)	L	S
6	4 <i>Le cossyphe d'Heuglin</i> (The white-browed robin-chat)	Actor <b>Robin</b> Williams on a <b>chat</b> show (I7 for both)	R	E
7	10 <i>La grive des bois</i> (The wood thrush)	The epigraph to this movement of <i>Des canyons aux étoiles...</i> is from Revelation 2:17 (I8): "Je lui donnerai une pierre blanche: sur la pierre est gravé un nom nouveau, que nul ne connaît sauf celui qui le reçoit." ("I will give him a white stone: on the stone is engraved a new name, which no-one knows except he that receives it.")	H	I

P	Movement	Picture connection	S	R
8	3 <i>Ce qui est écrit sur les étoiles</i> (What is written in the stars)	Horoscope (I9) for the birth of Olivier Messiaen (I10), at 22:50:39 GMT on 10 December 1908 at Avignon (see H35). According to <i>Messiaen</i> by Peter Hill and Nigel Simeone, “the Register of Births at Avignon records that Olivier Eugène Prosper Charles Messiaen was born on 10 December 1908 at 11 o'clock in the evening.” In 1908, France used Paris Mean Time, which was 9 minutes and 21 seconds ahead of Greenwich Mean Time.	E	T
9	11 Omao, leiothrix, elepaio, shama	The ‘ōma‘o, red-billed leiothrix, ‘elepaios and white-rumped shama are birds that may be found in Hawaii, which is pictured (I11). Additionally, ‘ōma‘o means <i>green</i> in Hawaiian, and the islands are coloured green on the map (I12). The shade of green resembles one used by the artist Oliver Messel, and known as “Messel Green” (I13).	S	O
10	2 <i>Les orioles</i> (The orioles)	A player for the Baltimore Orioles baseball team (I14), namely Adam Jones. He plays at number 10, the same as Lionel Messi.	E	N
11	12 <i>Zion Park et la cité céleste</i> (Zion Park and the celestial city)	The battle for Zion (I15) in the 2003 film <i>The Matrix Revolutions</i>	L	N
12	1 <i>Le désert</i> (The desert)	A desert (I16); in particular, sand dunes at Mesquite Flats, Death Valley, California. Death Valley was one of the U.S. locations visited by Messiaen in 1972 that inspired <i>Des canyons aux étoiles...</i> (I17)	B	I

‘(Hello, God)’ is written on the postcards representing movements 1 and 5. This alludes to *Paroles de Dieu (Words of God)* by the theologian Ernest Hello (I18), since Messiaen gives quotes from this work as epigraphs to these two movements (I19).

If the initials of the postcard recipients are arranged in the order of the movements, the result is **INTERVERSION** (I20), which is the name given by Olivier Messiaen to the musical permutations that appear in many of his works (I21). Messiaen’s technique is to repeatedly apply a permutation to a sequence of pitches or durations, getting “Interversion I” by applying the permutation to the original sequence, “Interversion II” by applying the permutation to Interversion I, and so on, until eventually the original sequence is restored.

The sequence of movements in page order, 7 6 8 5 9 4 10 3 11 2 12 1, is itself an interversion (I22). In particular, this is the same rearrangement as Interversion I in the 4th movement “Île de feu II” of *Quatre études de rythme*, which Messiaen describes as a “permutation in the form of an open fan”. If we now take the initials of the postcard *senders* and apply Messiaen’s technique (I23), we get the following succession of interversions:

Interversion	Arrangement of sender initials
I	CEABLRHESELB (senders in page order)
II	HRELSBEALEBC

Interversion	Arrangement of sender initials
III	EBASLLEEBRCH
IV	ELELBSRACBHE
V	RSABCLBEHLEE
VI	<b>BLECHBLAESER</b>
VII	LBAHECSEELRB
VIII	SCEEEHLARBBL
IX	LHAEREBEBCLS
X	BEERBECALHSL

Interversion VI is the German word **BLECHBLAESER** (or **BLECHBLÄSER**) (I24), meaning 'brass players' or 'brass (section of an orchestra)' (I25). The German word for 'brass' is **MESSING** (I26), where the treasure is found (see G10).

## River puzzle (R1–R13)

The map on page 3 is of the **River Mess** in Luxembourg (R1). Eight cards have pairs of words, for example 'WHOLE CRUISE'. These are anagrams of names of villages on the River Mess (R2), indicated by red dots on the map. The cards contain the final steps for finding the treasure (R3). All eight cards must be used in the same order as the river flows through or past the corresponding villages (R4). The first six cards form a picture trail, shown on the map on page [25], which can be picked up after following the instructions from Messing church (see A37); the seventh is connected to the Birds cipher (see B1), and the eighth has the Telegram cipher (see Y1). The eight villages, in order from the source of the Mess to its confluence with the Alzette, are as follows:

Anagram	Village	Card
WHOLE CRUISE	<b>SCHOUWEILER</b> (R5)	Decorative wheel on house, School Road, Messing
PINK RANGES	<b>SPRINKANGE</b> (R6)	Public footpath sign, School Road, Messing
BEAT GENT	<b>BETTANGE</b> (R7)	Fence posts with diagonal brace, Conyfield Wood
NECK GEAR	<b>RECKANGE</b> (R8)	Forked tree by path, Conyfield Wood
HEN GALE	<b>EHLANGE</b> (R9)	Blue pipe, Conyfield Wood
CAKE WRING	<b>WICKRANGE</b> (R10)	Small pond, Conyfield Wood
PINE PORTER	<b>PONTPIERRE</b> (R11)	Birds cipher (see B1), leading to IN FALLEN TREE
BE GERM	<b>BERGEM</b> (R12)	Telegram cipher (see Y1), leading to IN A TREE CLEFT

Some of these villages have full names ending *-sur-Mess*, for example Reckange-sur-Mess. Either form gets the mark. The red and blue colours used for the River Mess, villages, and card outlines are those from the Luxembourg flag (R13).



## Birds cipher (B1–B11)

The birds pictured in the ellipses on page 10 and on the postcard stamps are those named in the titles of the thirteen movements of Olivier Messiaen's work *Catalogue d'oiseaux* (Catalogue of birds) (B1). Facing to the right, the birds in movement order represent letters A–M; facing left, they represent Z–N (B2). This arrangement of letters is clued by the two Alpine choughs facing right and left on the card labelled PINE PORTER (see R11); these form an A ... Z indicator (B3).

Movement	French	English	Right	Left
1	Le chocard des alpes	Alpine chough	A	Z
2	Le loriot	Golden oriole	B	Y
3	Le merle bleu	Blue rock thrush	C	X
4	Le traquet stapazin	Black-eared wheatear	D	W
5	La chouette hulotte	Tawny owl	E	V
6	L'alouette lulu	Woodlark	F	U
7	La rousserolle effarvatte	Reed warbler	G	T
8	L'alouette calandrelle	Greater short-toed lark	H	S
9	La bouscarle	Cetti's warbler	I	R
10	Le merle de roche	Common rock thrush	J	Q
11	La buse variable	Common buzzard	K	P
12	Le traquet rieur	Black wheatear <sup>4</sup>	L	O
13	Le courlis cendré	Curlew	M	N

The line of birds on page 10 deciphers as follows:

**ADD (B4) SENDER (B5) TO (B6) STAMP (B7)**

This instruction indicates that on each page the initial letter of the sender of the postcard message is to be added to the letter enciphered by the bird on the postcard stamp (B8). The addition is carried out by treating letters as numbers in cyclic order, taking A=1=27, B=2=28, C=3=29, and so on. For example, on page 7 the sender is Heracles and the stamp shows a black-eared wheatear facing left, encoding the letter W. Adding H=8 and W=23 yields 31=E. Taken in page order, the twelve postcards spell out:

**IN (B9) FALLEN (B10) TREE (B11)**

This clues the hiding place of the treasure in a fallen tree near the small pond in Conyfield Wood near Messing, pictured on page [27].

<sup>4</sup> The picture we used for the black wheatear (from François Levaillant's *Histoire naturelle des oiseaux d'Afrique*, 1808) was misleading: the bird depicted would now be placed in the species *Oenanthe leucopyga*, the white-crowned wheatears. This distinction wasn't made until some decades after Levaillant, but admittedly before Messiaen. We apologise to any solvers who had trouble with this.



## Telegram cipher (Y1–Y8)

The text on the card on page 3 labelled BE GERM is in a ‘cipher-code for astronomical messages’ (Y1) by Edward S. Holden, found in *Publications of the Astronomical Society of the Pacific*, Vol. 8, No. 49 (1 April 1896), pp. 109–133. The column headings *R.A.* and *N.P.D.* are abbreviations for *Right Ascension* (Y2) and *North Polar Distance* (Y3) respectively. As described in Holden’s paper, Right Ascension is encoded as a *time* in hours (two digits), minutes (two digits), and tenths of minutes; while North Polar Distance is encoded as an *angle* in degrees (three digits) and minutes (two digits). Each row decodes to a position in the sky corresponding to a Messier object (Y4) using the standard astronomical epoch J2000.0. If the Messier objects are replaced by the initial letters from the picture quiz, a message is deciphered as follows:

Telegram	R.A.	N.P.D.	Object	Letter
HODIVATE FONAHOLD	10 <sup>h</sup> 46.8 <sup>m</sup>	078° 11′	M96	I
LARENDOW DULINIZE	18 <sup>h</sup> 53.6 <sup>m</sup>	056° 58′	M57	N
LAFERKIN HUFATION	18 <sup>h</sup> 03.8 <sup>m</sup>	114° 23′	M8	A
FAPIPTIK HORIBODE	06 <sup>h</sup> 46.0 <sup>m</sup>	110° 44′	M41	T
LUGOROUS HIPERKIN	20 <sup>h</sup> 58.9 <sup>m</sup>	102° 38′	M73	R
BAPEBLOW DOPAFRAS	00 <sup>h</sup> 42.7 <sup>m</sup>	049° 08′	M32	E
DUDIREKT DUGILEGE	05 <sup>h</sup> 36.1 <sup>m</sup>	055° 52′	M36	E
KINOCEAN HOZINODE	16 <sup>h</sup> 17.0 <sup>m</sup>	112° 59′	M80	C
LAFAVISH HUDABATE	18 <sup>h</sup> 02.6 <sup>m</sup>	113° 02′	M20	L
HOYALONE DAPARINE	11 <sup>h</sup> 11.5 <sup>m</sup>	034° 20′	M108	E
LUGEMBUE HIPEJEKT	20 <sup>h</sup> 53.5 <sup>m</sup>	102° 32′	M72	F
JALIRIZE FOLABOUT	12 <sup>h</sup> 26.2 <sup>m</sup>	077° 03′	M86	T

This results in the message:

**IN (Y5) A (Y6) TREE (Y7) CLEFT (Y8)**

This clues the hiding place of the treasure in the fallen tree, pictured on page [27]. We hope you were not stung by the wood beast.

## Music cipher (U1–U11)

Short pieces of sheet music appear on pages 1, 7, 9 and 10, each with a dashed grey line connecting it to another puzzle element. On page 1, the name ‘Nieve O. Serialism’ appears. This is an anagram of **OLIVIER MESSIAEN** (U1), who was an exponent of the musical technique of serialism (U2). All four extracts employ the *langage communicable*, a musical cipher invented by Messiaen for his organ work *Méditations sur le mystère de la Sainte Trinité* (Meditations on the mystery of the Holy Trinity) (U3 for either the cipher or the work):



Applying this cipher to the extracts yields phrases in French:

Page	French	English	Connection
1	<b>ARCS-EN-CIEL</b> (U4)	Rainbows	To the rainbow (see Q5)
7	<b>BRUSQUES ÉTOILES</b> (U5)	Sudden (or abrupt) stars	To the comets cipher (see C1); comets could be poetically described thus (U6)
9	<b>FOUILLIS</b> (U7)	Mess (or tangle)	To the tangled string (see S1)
10	<b>ÉPÉES DE FEU</b> (U8)	Swords of fire	To the badge for the Essex County <i>Fire and Rescue Service</i> (see Q110), which includes three <i>swords</i> (U9)

The phrases come from Messiaen's *Quatuor pour la fin du temps* (Quartet for the end of time) (U10), from the preface to the 7th movement, *Fouillis d'arcs-en-ciel, pour l'Ange qui annonce la fin du Temps* (Tangle of rainbows, for the Angel who announces the end of Time). He writes:

Dans mes rêves, j'entends et vois accords et mélodies classés, couleurs et formes connues ; puis, après ce stade transitoire, je passe dans l'irréel et subis avec extase un tournoiement, une compénétration giratoire de sons et couleurs surhumains. Ces **épées de feu**, ces coulées de lave bleu-orange, ces **brusques étoiles** : voilà le **fouillis**, voilà les **arcs-en-ciel** !

That is:

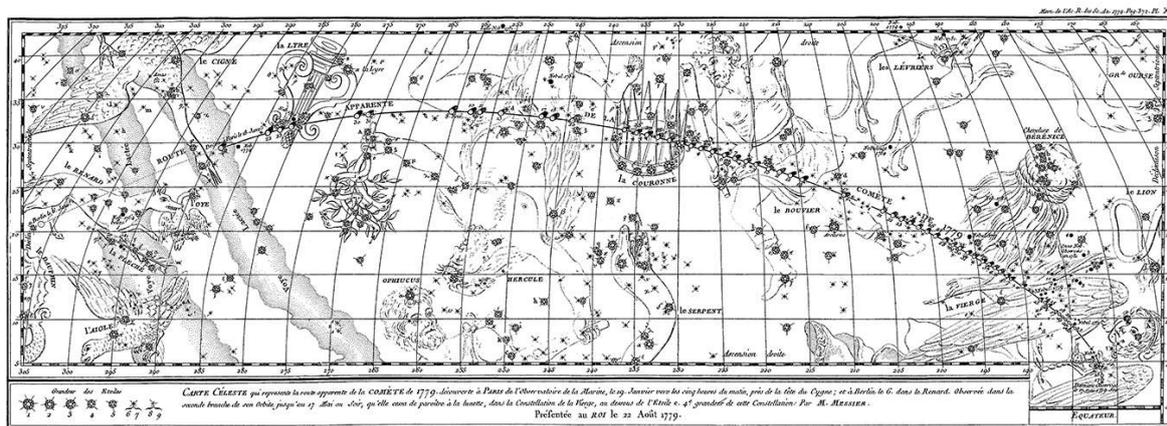
In my dreams, I hear and see classified chords and melodies, known colours and shapes; then, after this transitory stage, I pass into the unreal and undergo with ecstasy a whirling, a gyratory interpenetration of superhuman sounds and colours. These **swords of fire**, these blue-orange lava flows,<sup>5</sup> these **sudden stars**: there is the **tangle**, there are the **rainbows**!

The work was composed and first performed in 1941 in a prisoner-of-war camp. The first performance was on 15 January; the Hunt finished on 15 January too, and this is also an 'end of time' (U11), that is, time for teams to find the treasure and submit solutions.

## Comets cipher (C1–C13)

The curved path with dots on page 7 resembles the way astronomers plot the path of a comet across the sky (C1). Compare with Messier's chart of comet C/1 1779 on page [30].

<sup>5</sup> Sadly, we were unable to find a convincing way to include a blue-orange lava flow in the Hunt.



The numbers correspond to years in which comets were first discovered by Charles Messier (C2). The comet discovered in the first year on the path was the Great Comet of 1769, which is pictured (C3) (see Q53). The modern designations for these comets have a letter corresponding to the half-month in which the comet was discovered, for example the Great Comet of 1769 is designated 'C/1769 P1', using the letter 'P' because Messier first observed it on 8 August. The thirteen comets discovered by Messier are as follows:

Original designation	Modern designation	Date of discovery
1759 II Messier <sup>6</sup>	C/1760 B1	26 January 1760
1763 Messier	C/1763 S1	28 September 1763
1764 Messier	C/1764 A1	3 January 1764
1766 I Messier	C/1766 E1	8 March 1766
1769 Messier	C/1769 P1	8 August 1769
1770 I Messier (Lexell's comet) <sup>7</sup>	D/1770 L1	14 June 1770
1771 Messier	C/1771 G1	1 April 1771
1773 Messier	C/1773 T1	12 October 1773
1780 I Messier	C/1780 U2	27 October 1780
1785 I Messier–Méchain	C/1785 A1	7 January 1785
1788 I Messier	C/1788 W1	25 November 1788
1793 I Messier	C/1793 S2	27 September 1793
1798 I Messier	C/1798 G1	12 April 1798

Taking the half-month letters in order along the path deciphers the following message:

<sup>6</sup> The original designation '1759 II Messier' has a different year from the modern designation 'C/1760 B1'. We think that's because the date of the New Year was not yet standardized across France, and parts of the country still used dates other than 1 January for the New Year, for example the Feast of the Annunciation (25 March) or Holy Saturday. It was not until the Edict of Roussillon came into force in 1767 that the whole country used 1 January.

<sup>7</sup> Lexell's comet is one of a handful of comets commonly known by the computer of its orbit (Anders Lexell), rather than its discoverer. Encke's and Halley's are two other comets in this category.

**PUB (C4) PALATABLE (C5) BUT (C6) WE (C7) SUGGEST (C8) GET (C9) A (C10) TABLE (C11)**

This refers to the desirability of booking in advance if eating at the **Old Crown** in Messing (C12) after a visit to the treasure site.

### Miscellany (X1–X11)

On page 1, the picture of Lionel Messi (see Q7) is linked to a thought bubble containing seven rainbow-coloured hearts. Using the usual correspondence between rainbow colours and notes of the major scale (see T10) this encodes the opening bars of the Christmas carol ‘**Unto us is born a son**’ (X1):



This refers to the news that Lionel Messi and his wife Antonella Rocuzzo are expecting a son (X2), which was [revealed by the latter on Instagram](#) with the announcement, "Familia de 5 ❤️❤️❤️❤️❤️ #blessed 🧑🧒🧒". We hope they had a very Messi Christmas.

On page 12, the ‘A.T.H. Scoreboard 2017’ appears. In this table, the ‘teams’ represent the major themes of the hunt (X3) and the ‘scores’ their 2017 anniversaries (X4), each measured in a multiple of a ‘score’ of years (X5), as follows:

Event	Theme	Anniversary	Mark for all three
Death of	Olivier Messiaen	25 years (or 1992)	(X6)
Birth of	Lionel Messi	30 years (or 1987)	(X7)
Publication of	Mr Messy	45 years (or 1972)	(X8)
Battle of	Messines	100 years (or 1917)	(X9)
Death of	Charles Messier	200 years (or 1817)	(X10)

The scores themselves add up to a score (X11). Our thanks to the Past Setters for giving us the 2017 setting slot, which coincided with so many thematic anniversaries.<sup>8</sup>

The Christmas message contained an allusion to Alexander Pope’s poem *An Essay on Man*, to help solvers who had not yet identified Pope’s *Messiah* from the rebus clue, and a photograph of a hand of nine playing cards, K♠ 5♠ 6♥ 6♣ Q♥ Q♣ 8♣ Q♦ 5♦. These cards can be deciphered using the code A=A♠/A♦, B=2♠/2♦, ..., Y=Q♥/Q♣, Z=K♥/K♣ to reveal the message MESSY YULE.

<sup>8</sup> If Valeria Messalina had been born in AD 17, as claimed by Wikipedia, then 2017 would have been the 2000th anniversary of her birth. But unfortunately Wikipedia is mistaken: as far as we can tell, there is no historical evidence for any particular year of birth for Messalina.