

SINCLAIR MCKAY



BLETCHLEY PARK BRAINTEASERS

Over 100 puzzles, riddles
and enigmas inspired by
the greatest minds
of World War II

Would
Bletchley Park
have recruited
YOU?



SUPPORTED BY **BLETCHLEY PARK**



ABOUT THE AUTHOR

Sinclair McKay is the author of the bestselling *Secret Life of Bletchley Park*. He writes for the *Spectator* and the *Telegraph* and spends much of his life eyebrow-deep in dusty archives!

He lives in east London.

INTRODUCTION

Not everyone who worked at Bletchley Park was a genius on the level of mathematician Alan Turing. But every recruit had a luminously inquisitive mind.

And the thousands of super-bright young women and men pulled into the wartime codebreaking centre – from all walks of life, and with all sorts of different talents – often shared one particularly striking attribute.

They had an unusual appetite and love for puzzles.

In a few straightforward cases, this was to do with a natural taste for complicated equations and rich linguistics. After all, there were so many boffins gathered at this top-secret country estate in Buckinghamshire that some Bletchley townsfolk – none the wiser – thought the place was a special government lunatic asylum.

But not everyone there was an intellectual, and nor was it all maths and modern languages. There was something else too: the people gathered there, from whatever background – ordinary or extraordinary – all shared the ability to examine a problem from lots of different angles. And more: they shared the ability to relish and enjoy that problem.

The truly astonishing thing was this: by day and by night, these codebreaking men and women grappled with decryption problems that could cause terrible stress and even breakdowns. Yet often when off duty, they sought relief from this stress by diving into yet more puzzles.

The aim of this book is to present a wide range of the sorts of brainteasers, problems and enigmas that were either used to recruit the codebreakers, or were used by the codebreakers as a means of relaxing escapism from the day job.

Whatever their speciality – be it esoteric probability theories, an immersive knowledge of Japanese, a taste for colourful riddles, or simply a fierce addiction to the daily *Times* and *Telegraph* crosswords – the Bletchley Park codebreakers were wonderfully emblematic of a puzzle-loving nation. This taste came to suffuse the very philosophy of the establishment. The codebreakers had to be more than sharp, for the challenges they were to face in their work were the ultimate puzzles, upon which the fate of the nation depended.

When blackout came to Britain after the declaration of war against Germany

in September 1939, the Government Code and Cypher School at Bletchley – the codebreaking department that had relocated from St James's Park in London to this country estate midway between Oxford and Cambridge – immediately started looking for the brightest and the best.

The directors of Bletchley had already begun a systematic sweep of the universities throughout 1938 and they would later spread that net very much wider. They started by homing in on the young undergraduates in the mathematics departments. They wanted these students because they knew that they would be needed to fight the German encryption machine called Enigma that had been invented at the end of the First World War and was known to be used by the Nazis. It was an electric cipher machine that could theoretically produce 158 million million million combinations of letters.

But codebreaking was an art as well as a science, and it stretched back over the years, decades, centuries. As the draughty wooden huts that would house all the top-secret decryption activity were being built around the grounds of the Bletchley Park estate, the recruiters became cannier.

As well as seeking mathematicians, they also began looking for gifted young people with exceptional language skills: fluent German was naturally a great advantage. Indeed, as the war went on, candidates were needed who could master Japanese within the space of a few short weeks. So once again, the directors sent their scouts through the universities, making discreet enquiries.

Universities alone, however, could not provide all the recruits. Intelligence comes in all forms, not necessarily in mortarboards and black gowns. Before the war, Bletchley's directors had also put word out in aristocratic circles: throughout the 1930s, young women from the smarter families had often been sent out to Germany and Switzerland to finishing schools, where they acquired an ease with the languages of continental Europe.

And the net was to be thrown wider yet, for there were to be thousands of bright young female recruits – volunteers for the Women's Royal Naval Service amongst others – ushered into this shadowy, secret world, in order to operate the technology of the future. These Wrens, hailing from all sorts of different educational backgrounds and from all over the country, were sometimes selected by means of an innocuous-looking question on their application forms. The question asked if the candidates enjoyed mental recreations in the form of cryptic crosswords, or similar.

If the answer to this was yes, there followed several discreet intelligence tests. After which the brightest of these young women would find themselves issued with a ticket for a train journey to a clandestine destination, having sworn to keep secret for the rest of their lives the details of the crucial codebreaking work that was about to consume them. They would go on to become experts in the wiring and the workings of technology so intensely secret that at first not even Britain's closest allies knew about it.

Along the way, other kinds of talented individuals were cherry-picked by the Bletchley recruiters too. Various poets were pulled in to the codebreaking efforts. Again, an affinity and ear for the infinite possibilities of language was the hook. Then there were the musicians. One of the most striking aspects of the Bletchley Park story is that many of the young men and women gathered there had an amazing aptitude for music. There were endless concerts in and around Bletchley Park. Among the codebreakers were gifted pianists, violinists, sopranos and tenors. There were composers and conductors; artists who would go on to have extraordinary post-war careers. Something in the rhythms and structure of music clearly correlated to the discipline of codebreaking.

And codebreaking was a discipline as old as civilisation itself. Bletchley's decrypting predecessors in the inter-war and Great War years had also been drawn from varied fields. Some were experts at working with ancient hieroglyphs from tombs and faded papyrus fragments. These were people who could reconstruct long-dead languages and long-lost stories by breaking different sorts of codes: the symbols employed by the pharaohs, the extinct languages found on clay tablets in the deserts of Persia. If one could summon a vanished civilisation from a series of mysterious symbols, then it followed that one could equally reconstruct the encoded messages sent by German officers in the field.

Last but not least among the talented lateral thinkers of Bletchley Park were the chess champions – young men recruited directly through the chess grapevine. To excel at chess is to master the ability to hold a hundred abstract possibilities in one's head while trying to out-think one's opponent and divine their intentions, so it follows that chess players made formidably brilliant codebreakers. This went not merely for the whizz-kids of Bletchley Park, but their Soviet counterparts deep in Russia too.

So it is clear how Bletchley Park came to be seen by so many who worked there as a kind of university, for it fizzed with youthful intellectual and artistic

energy. For every socially awkward mathematician, there was a hilariously confident debutante; for every owlish classicist, conversing in ancient Greek, there was a swing-music-loving Wren who would pass the time with the most ferociously fiendish crosswords. The puzzles to be found in these pages are the sorts of problems they would have taken to with gusto: some indeed were recruited with exactly the types of problems presented here.

The crossword is the most famous of the butterfly nets with which the Bletchley directors caught their geniuses, so we must of course start there, but there were other conundrums too – ranging from lateral thinking tests to problems involving invented mythical languages. We've included a range of these here so you can begin to work out what sort of codebreaker you might have been. There are also examples here of the sorts of tests facing secret interception operatives: Morse code problems, in which the slightest lapse in accuracy could mean the difference between life and death.

All in all, the different sorts of puzzles presented here – some from archives, some directly inspired by the tests and challenges faced by Bletchley Park's brightest – are not only intended to be entertainingly mind-boggling. They also show that the young women and men who helped shorten the Second World War by some two years had brains that could happily turn somersaults through all sorts of enigmas: from Egyptian symbolism to surreal Lewis Carroll-style logic problems that would involve looking at the world upside down.

The codebreakers loved these sorts of exercises. It is to be hoped that you will find them delightful and addictive too.



GAMES

MUSIC

1

COMPOSITION STUDY

There's a keen rivalry at Bletchley to be the best at whatever you set out to be. Playing musical instruments is a popular pastime. Inevitably, there's a desire to be able to play more instruments than anyone else.

David, Jean, Michael and Susan are keen musicians. They can all play the recorder, and everyone except Michael can play the accordion. David is also more than competent playing the mandolin, oboe, trumpet and zither. Jean can play the saxophone, the ukulele and the tuba. Susan can play a euphonium, guitar and lute. Including the recorder, Michael plays three of Susan's instruments. He is the only one to play clarinet and piano. In addition, he plays one other instrument in the list played by David and Jean.

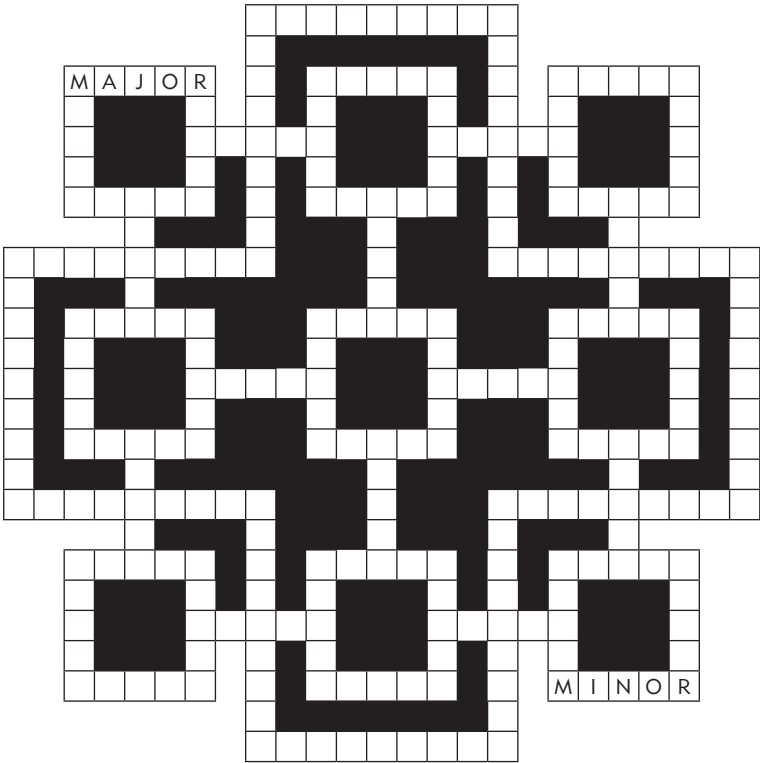
What other instrument can he play?

In each case, the initial letters of the instruments played by each codebreaker can be arranged to form the name of a famous composer. All initial letters are involved and they can be used more than once if needed. Can you work out which ones they are?

2

MAJOR TO MINOR

Fit all the listed words back into the grid. Words read either across or down. All the words containing NINE letters have a musical link. There is only one complete answer that can change MAJOR to MINOR, or change MINOR back to MAJOR.



5 LETTERS

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| ALBUM | AMONG | APHID | APPLY | BAKER | BLANK | BROKE | CHILL |
| COVER | COWER | DAZED | DRIED | DUKES | ENDED | ENTER | ESSAY |
| FADED | FILTH | FLOOR | GUILD | HEATS | KAYAK | KNOLL | LUCKY |
| MAGIC | MAJOR | MANIA | MANIC | MINOR | OFFER | PATCH | PIANO |
| PROXY | QUIET | QUOTE | RANGE | REBEL | REPLY | ROYAL | SPRIG |
| STRUM | SWEET | TEMPO | TENOR | TEPID | THEME | WASTE | ZEBRA |

9 LETTERS

- | | | | |
|-----------|-----------|-----------|-----------|
| CASTANETS | COMPOSERS | CONDUCTOR | CRESCENDO |
| EUPHONIUM | GLISSANDO | HARMONICA | HARMONIUM |
| ORCHESTRA | OVERTURES | RECORDING | SEMIBREVE |

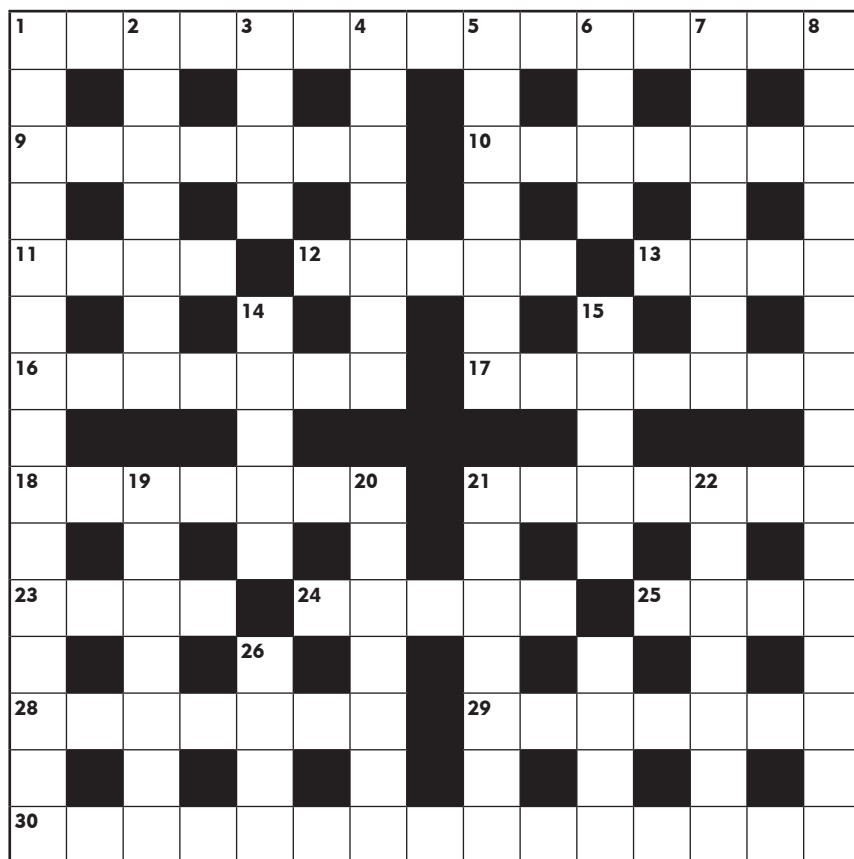
CROSSWORDS

1

THE TIMES

AUGUST 15TH 1939

Several weeks before war is declared, the codebreaking operation moves from London to Bletchley Park. Here's the crosswords from that day.



ACROSS

1. The speech of a baby elephant employs it, perhaps (two words) (11, 4)
9. Evidently I turn green with dizziness (7)
10. American inventor, not Oriental (7)
11. Indoor caps for the masses (4)
12. Not usually thought of as a composer of small beer (5)
13. She exhibits a miser's characteristic in 25 (4)
16. Section announcements (7)
17. The rarefied atmosphere necessary for vanishing tricks (two words) (4, 3)
18. The gardener is unfeeling with an inhabitant of his soil (7)
21. The mother insect is an elephantine creature (7)
23. Domesticated river (4) —
24. — and streams of fire-water? (5)
25. See 13 (4)
28. A freckle? (7)
29. It pulls a vehicle back on a hill (7)
30. Flag seen and felt unwillingly (three words) (5, 3, 7)

DOWN

1. They have brought colour to our flags (two words) (8, 7)
9. Food that gets into the mouth of only a favoured horse? (7)
3. Chain letters? (4)
4. They seem foolish things to eat with soup (7)
5. '—as simplicity, and warm As ecstasy' (Cowper) (7)
6. A land where you are without a ship (4)
7. To fern may be sound, mother (7)
8. Ballet music is not their forte, however (two words) (5, 10)
14. Obsolete scuffle (5)
15. Diaphanous (5)
19. The country of the people in the song (7)
20. Where a relative is in not up (7)
21. Naturally they take some of the secretuary's time (7)
22. Singular action popular among 8 (7)
26. How part of 4 can be taken (as it often is) muscially! (4)
27. Just weather (4)

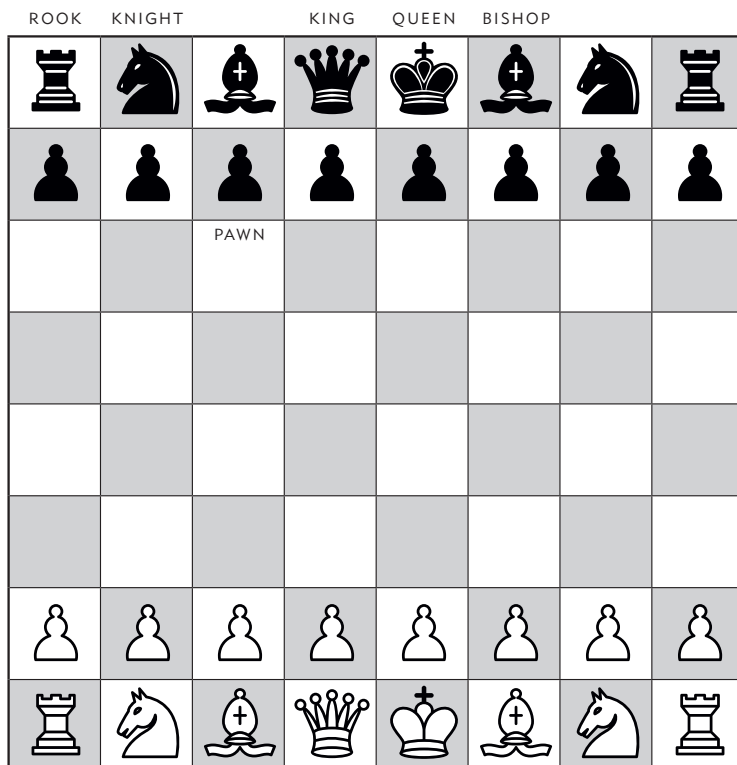
CHESSE

1

OPENING GAMBIT

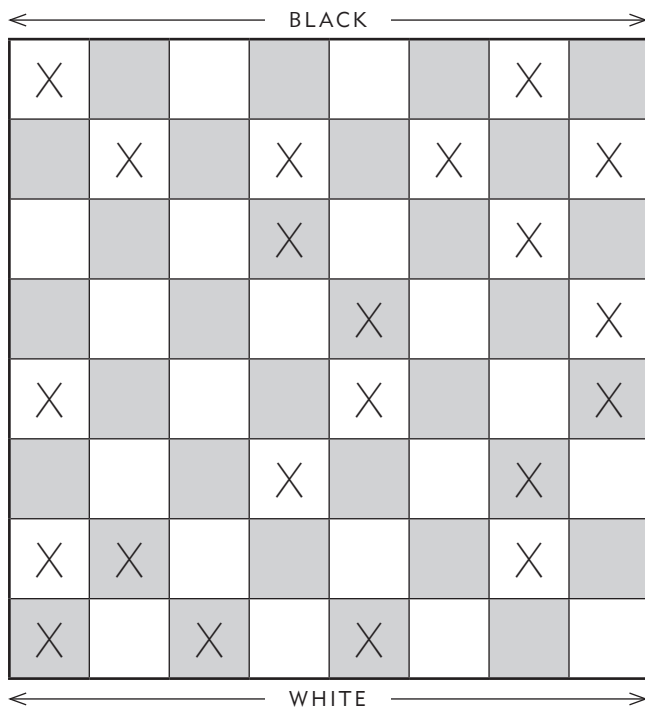
If you have never played chess before you can still tackle all the puzzles in this section. If you are more than a little rusty on the intricacies of the moves of individual pieces or you think the Sicilian Defence is an exotic cocktail, don't worry! All the information is provided in these pages for puzzle solving.

Here's a chess board set out for the opening of a game. Each player starts with eight pawns, one king, one queen, two rooks (or castles), two knights and two bishops.



BLETCHLEY PARK BRAINTEASERS

Here's a chess board where the pieces are replaced by Xs. With the help of the clues, put all the places back in place and pinpoint the position of the two kings.



CLUES

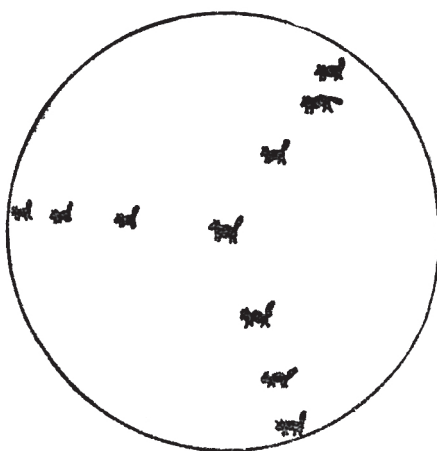
- White has lost three times as many pawns as black.
- Over all black has lost more pieces than white.
- Both black and white have five pieces that have not moved in the game.
- Both kings and queens are on the board, they have all moved and none are on a square matching their colour. In fact, all of the black pieces are on white squares.
- Looking across a row, or rank, of squares the two queens have each other in their sights.
- Pawns like to move forward (they're the only pieces that cannot move backward) and two pawns are the most advanced pieces down the board for black.
- The only knights remaining are two white knights, and one is the most advanced piece for white. Both knights are on black squares and they are the only coloured pair of starter pieces that remain on the board.
- Looking up and down the columns, or files, of squares there are seven times when two pieces with the same name appear in a file together.

MATHEMATICS

1

THE WIZARD'S CAT

A wizard placed ten cats inside a magic circle as shown in our illustration, and hypnotized them so that they should remain stationary whilst under his spell. He then proposed to draw three circles inside the large one, so that no cat could approach another cat without crossing a magic circle. Try to draw the three circles so that every cat has its own enclosure and cannot reach another cat without crossing a line.



2

MRS. TIMPKIN'S AGE

EDWIN: 'Do you know, when the Timpkinses married eighteen years ago Timpkins was three times as old as his wife, and today he is just twice as old as she?'

ANGELINA: 'Then how old was Mrs. Timpkins on the wedding day?'

Can you answer Angelina's question?

MORSE CODE

MORSE SYMBOLS

Alphabet

A • -	G - - •	M - -	S • • •	Y - • - -
B - • • •	H • • • •	N - •	T -	Z - - • •
C - • - •	I • •	O - - -	U • • -	
D - • •	J • - - -	P • - - •	V • • • -	
E •	K - • -	Q - - • -	W • - -	
F • • - •	L • - • •	R • • •	X - • • -	

Numerals

1 • - - - -	3 • • • - -	5 • • • • •	7 - - • • •	9 - - - - •
2 • • - - -	4 • • • • -	6 - • • • •	8 - - - • •	0 - - - - -

1

THE FIRST MORSE MESSAGE

On 24th May 1844, almost a hundred years before World War II, Samuel Morse sent his first Morse code message using a dot and dash code, between Washington and Baltimore. It was sent by means of sound down a telegraph wire and his very first message was, 'What hath God wrought'.

Decipher the message below which uses the same letters as Morse did all those years ago in that original communication – but not in the same order!

- - - • • - - - • • • • - / - - - - / - • • - - - /
 - - • - - - - - • • • /

- • • • • • - • - - - • • - - - • • • • - - - • • - - /
 - • • • • • • - - / • - - • - • - • •

2

OVER TO YOU

Try your hand at translating this message into Morse code. It is taken from an authentic message transmitted in 1944:

ARROMANCHES UNDER FIRE. REINFORCED AIR RECCE.
JUNE 6 NORMANDY.



ANSWERS

MUSIC

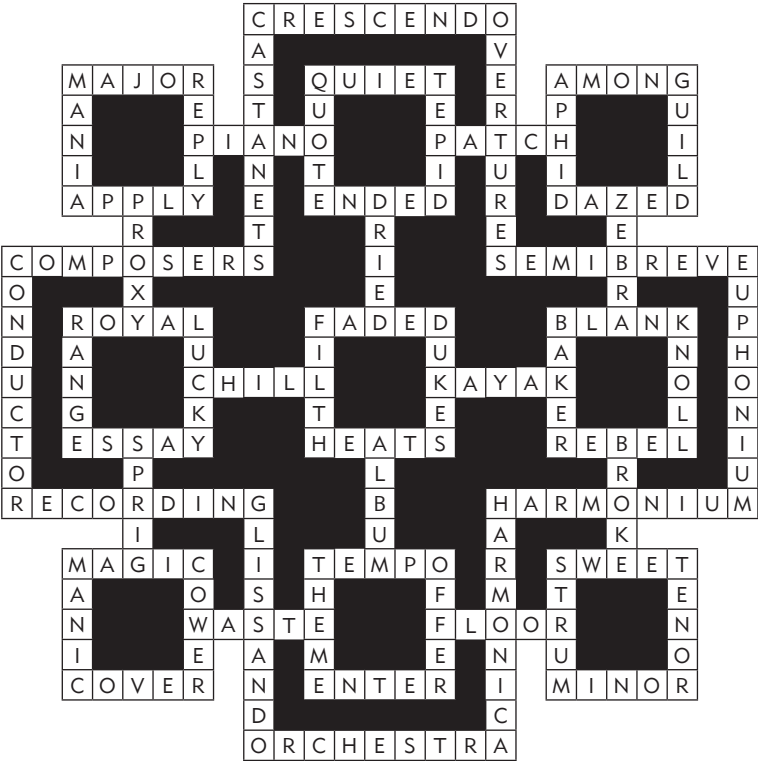
1

COMPOSITION STUDY

Michael also plays the ukulele. In each case the initial letters of the instruments played can be arranged to form the name of a famous composer. All initial letters are involved and they can be used more than once if needed. David plays accordion, mandolin, oboe, recorder, trumpet and zither making MOZART. Jean plays accordion, recorder, saxophone, tuba and ukulele making STRAUSS (letter S used more than once). Susan plays accordion, euphonium, guitar, lute and recorder making ELGAR. Michael plays clarinet, piano and recorder plus three of the instruments Susan plays. We are told Michael does play the recorder and he does not play the accordion. Therefore, he plays two instruments from the euphonium, guitar and lute. Initial letter combinations must be C, P, R + E, G / E, L / G, L. The addition of an extra instrument with a U for ukulele gives the combination clarinet, euphonium, lute, piano, recorder and ukulele from which PURCELL can be made.

2

MAJOR TO MINOR



CROSSWORDS

1

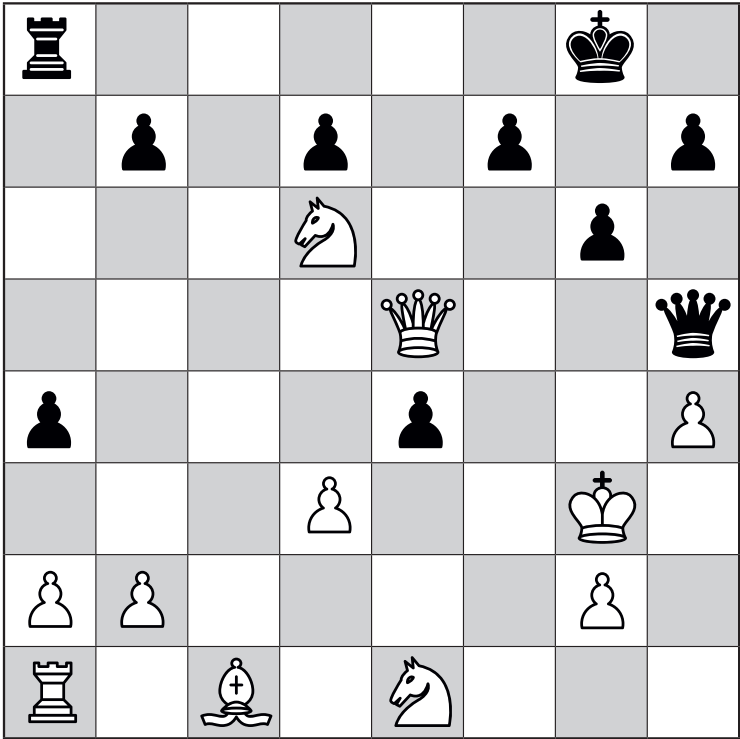
AUGUST 15TH 1939

1	P	O	2	R	T	3	M	A	4	N	T	5	E	A	6	U	W	7	O	R	8	D
	A			A			A			O			L			S			S			A
9	V	E	R	T	I	G	O					10	E	A	S	T	M	A	N			
	E			E			L			D			G			R			U			C
11	M	O	B	S			12	E	L	G	A	R			13	N						E
	E			I			14	S		E			N		15	F			D			O
16	N	O	T	I	C	E	S						17	T	H	I	N	A	I	R		
	T						R									L						C
18	A	D	19	A	M	A	N	20	T				21	M	A	M	M	22	O	T	H	
	R			R			P		A				I			Y			N			E
23	T	A	M	E			24	B	U	R	N	S			25	M	E	S	S			
	I			E			26	O		N			U			F		S			T	
28	S	U	N	S	P	O	T						29	T	R	A	C	T	O	R		
	T			I			U						E			I			E			A
30	S	T	A	R	S	A	N	D	S	T	R	I	P	E	S							

CHESSE

1

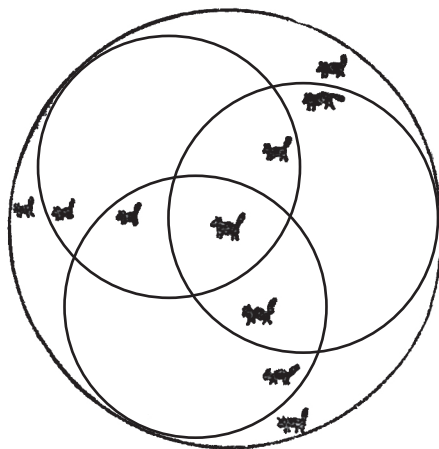
OPENING GAMBIT



MATHEMATICS

1

THE WIZARD'S CAT



2

MRS. TIMPKIN'S AGE

The age of the younger at marriage is always the same as the number of years that expire before the elder becomes twice her age, if he was three times as old at marriage. In our case it was eighteen years afterwards; therefore Mrs. Timpkins was eighteen years of age on the wedding-day, and her husband fifty-four.

MORSE CODE

1

THE FIRST MORSE MESSAGE

Ought to do good throughout that war.

2

OVER TO YOU

• - • - • • - • - - - - - • - - • - • • • • • • • • / • • - - • - • • • • /
• • - • • • • • • • / • • • • • • • • • • - • - - - • • - • - • • • • /
• - • • • • • /
• • • • • • • • • • • • /
• - - - • • - • • • • • • / - • - - - • • - - • - • • - • • - • - - •

Would you love to master morse code? Could you have outsmarted an Enigma machine? Would your love of chess have seen you recruited into the history books?

When scouring the land for top-level code breakers, the Bletchley Park recruiters left no stone unturned. As well as approaching the country's finest mathematicians, they cast their nets much wider, interviewing sixth-form music students who could read orchestral scores, chess masters, poets, linguists, hieroglyphics experts and high society debutantes fresh from finishing school. To assess these individuals they devised various ingenious mind-twisters – **hidden codes, cryptic crosswords, secret languages, complex riddles** – and it is puzzles such as these, together with the fascinating recruitment stories that surround them, that make up the backbone of this book.

The code breakers of Bletchley Park were united in their love of a good puzzle. If you feel the same, why not dive in, put your mental agility to the test and discover:

Would Bletchley Park have recruited YOU?

978 1 4722 5260 4
£12.99

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