

Arkadij Naiditsch
Csaba Balogh

Most instructive endgames of 2016



Chess
Evolution

Cover designer
Piotr Pielach

Typesetting
Piotr Pielach <www.i-press.pl>

First edition 2017 by Chess Evolution

Most instructive endgames of 2016
Copyright © 2017 Chess Evolution

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, photocopying, recording or otherwise, without prior permission of the publisher.

ISBN 978-83-945362-6-8

All sales or enquiries should be directed to Chess Evolution
2040 Budaors, Nyar utca 16, Magyarorszag

e-mail: info@chess-evolution.com
website: www.chess-evolution.com

Printed in Hungary

TABLE OF CONTENTS

Table of Contents	3
Key to symbols	7
Introduction	9
Preface	11
1. Pawn endgames	13
GAME 1 ▷ I. Ivanisevic (2643) ▶ A. Volokitin (2624)	13
GAME 2 ▷ A. Demuth (2545) ▶ J. Jolly (2361)	15
2. Transposing into pawn endgames	19
GAME 1 ▷ S. Ivanov (2556) ▶ M. Krasenkow (2610)	19
GAME 2 ▷ M. Carlsen (2844) ▶ Hou Yifan (2673)	22
3. Queen endgames	25
GAME 1 ▷ Hou Yifan (2663) ▶ S. Mamedyarov (2748)	25
4. Transposing into queen endgames	27
GAME 1 ▷ C. Balogh (2659) ▶ J. Van Foreest (2541)	27
5. Minor piece endgames	31
GAME 1 ▷ B. Gelfand (2735) ▶ K. Georgiev (2624)	31
GAME 2 ▷ Ding Liren (2766) ▶ L. Dominguez (2732)	34
GAME 3 ▷ R. Wojtaszek (2713) ▶ K. Dragun (2594)	37
GAME 4 ▷ G. Gajewski (2633) ▶ J. Tomczak (2603)	39
GAME 5 ▷ R. Robson (2663) ▶ A. Lenderman (2618)	42
GAME 6 ▷ M. Vachier-Lagrave (2788) ▶ P. Eljanov (2765)	44
GAME 7 ▷ Bu Xiangzhi (2723) ▶ V. Artemiev (2669)	47
GAME 8 ▷ S. Sjugirov (2674) ▶ V. Kramnik (2801)	49
GAME 9 ▷ I. Cheparinov (2685) ▶ D. A. Guijarro (2616)	53
GAME 10 ▷ Ding Liren (2778) ▶ Wang Hao (2734)	55
GAME 11 ▷ Wang Yue (2730) ▶ Wang Hao (2734)	58
GAME 12 ▷ Yi Wei (2696) ▶ A. Giri (2785)	60
GAME 13 ▷ Ding Liren (2778) ▶ Grischuk (2747)	64
GAME 14 ▷ V. Kunin (2592) ▶ E. Safarli (2678)	68
GAME 15 ▷ R. Svane (2546) ▶ B. Harsha (2344)	70
GAME 16 ▷ F. Caruana (2807) ▶ Ding Liren (2755)	73

GAME 17	▷ S. Karjakin (2772) ▶ M. Carlsen (2853)	77
6. Transposing into minor piece endgames		81
GAME 1	▷ Li Chao b (2751) ▶ L. Lenic (2611)	81
7. Rook endgames		83
GAME 1	▷ A. Donchenko (2568) ▶ Li Chao (2756)	83
GAME 2	▷ Yue Wang (2718) ▶ V. Ivanchuk (2710)	85
GAME 3	▷ D. Bocharov (2595) ▶ E. Inarkiev (2677)	88
GAME 4	▷ L. Aronian (2786) ▶ H. Nakamura (2790)	91
GAME 5	▷ V. Anand (2762) ▶ L. Aronian (2786)	94
GAME 6	▷ L. Aronian (2784) ▶ A. Grischuk (2752)	97
GAME 7	▷ R. Kasimdzhanov (2704) ▶ Li Chao2 (2756)	102
GAME 8	▷ V. Malakhov (2695) ▶ Y. Liu (2413)	105
GAME 9	▷ G. Kamsky (2670) ▶ A. Grischuk (2752)	107
GAME 10	▷ D. Mehaj (2204) ▶ D. Swiercz (2656)	109
GAME 11	▷ D. Navara (2735) ▶ B. Jobava (2661)	113
GAME 12	▷ S. Mamedyarov (2748) ▶ A. Giri (2790)	115
GAME 13	▷ V. Kramnik (2812) ▶ H. Nakamura (2787)	118
GAME 14	▷ A. Pashikian (2615) ▶ J. Duda (2671)	121
GAME 15	▷ R. Wojtaszek (2733) ▶ E. Sutovsky (2622)	123
GAME 16	▷ V. Topalov (2761) ▶ L. Aronian (2792)	127
GAME 17	▷ R. Bates A (2347) ▶ E. Safarli (2691)	130
GAME 18	▷ R. Svane (2555) ▶ R. Pert G (2423)	134
GAME 19	▷ M. Adams (2748) ▶ A. Giri (2771)	136
8. Transposing into rook endgames		139
GAME 1	▷ A. Giri (2793) ▶ L. Aronian (2786)	139
GAME 2	▷ L. Aronian (2792) ▶ A. Giri (2782)	142
GAME 3	▷ L. Lenic (2624) ▶ A. Volokitin (2624)	144
GAME 4	▷ A. Beliavsky G (2603) ▶ L.-D. Nisipeanu (2668)	147
9. Complex endgames		151
GAME 1	▷ M. Krasenkow (2610) ▶ J. L. Hammer (2695)	151
GAME 2	▷ L. Ding (2766) ▶ M. Adams (2744)	154
GAME 3	▷ Hou Yifan (2673) ▶ W. So (2773)	156
GAME 4	▷ D. Navara (2730) ▶ F. Caruana (2787)	158
GAME 5	▷ B. Adhiban (2653) ▶ E. Safarli (2653)	161
GAME 6	▷ V. Kramnik (2801) ▶ V. Anand (2784)	163
GAME 7	▷ L. Aronian (2792) ▶ A. Shirov (2687)	165
GAME 8	▷ P. Svidler (2727) ▶ J. Smeets (2617)	169

GAME 9	▷ A. Khalifman (2624) ▶ D. Yuffa (2502)	171
GAME 10	▷ H. Nakamura (2790) ▶ P. Svidler (2757)	174
GAME 11	▷ L. Aronian (2786) ▶ S. Karjakin (2760)	176
GAME 12	▷ M. Vachier-Lagrave (2788) ▶ M. Carlsen (2851)	180
GAME 13	▷ P. Eljanov (2765) ▶ Li Chao (2755)	184
GAME 14	▷ V. Artemiev (2669) ▶ E. Tomashevsky (2722)	186
GAME 15	▷ B. Jobava (2661) ▶ R. Wojtaszek (2722)	188
GAME 16	▷ M. Carlsen (2855) ▶ V. Kramnik (2812)	192
GAME 17	▷ S. L. Shankland (2646) ▶ S. S. Ganguly (2654)	195
GAME 18	▷ M. Vachier-Lagrave (2798) ▶ R. Ponomariov (2706)	197
GAME 19	▷ W. So (2771) ▶ H. Nakamura (2791)	200
GAME 20	▷ M. Ly (2501) ▶ A. Kovalyov (2617)	203
GAME 21	▷ M. Carlsen (2853) ▶ S. Karjakin (2772)	205
GAME 22	▷ M. Carlsen (2853) ▶ S. Karjakin (2772)	211
GAME 23	▷ E. Bacrot (2689) ▶ C. J. Deepan (2471)	214

KEY TO SYMBOLS

=	Equality or equal chances
±	White has a slight advantage
∓	Black has a slight advantage
±	White is better
∓	Black is better
+ -	White has a decisive advantage
- +	Black has a decisive advantage
∞	unclear
∞	with compensation
↔	with counterplay
↑	with initiative
→	with an attack
Δ	with the idea
□	only move
N	novelty
!	a good move
!!	an excellent move
?	a weak move
??	a blunder
!?	an interesting move
?!	a dubious move
+	check
#	mate

INTRODUCTION

Useful information for our valued readers.

- »» This book is the continuation of last year's successful edition of "The Most Instructive Endgames of 2012-2015".
- »» The book contains the 70 most instructive endgames from 2016.
- »» The games were selected and analyzed by the authors GM Arkadij Naiditsch and GM Csaba Balogh.
- »» Most of the games are taken from the highest-level tournaments, such as the Baku Chess Olympiad, the World Championship Match Carlsen-Karjakin, London Super tournament. etc.
- »» Most of the endgames are played by the very best Grandmasters such as: Carlsen, Karjakin, Kramnik, Caruana and many more of the world's best chess-players.
- »» The games are sorted into the following chapters:
 1. Pawn endgames (2 games)
 2. Transposing into pawn endgames (2 games)
 3. Queen endgames (1 game)
 4. Transposing into queen endgames (1 game)
 5. Minor piece endgames (17 games)
 6. Transposing into minor piece endgames (1 game)
 7. Rook endgames (19 games)
 8. Transposing into rook endgames (4 games)
 9. Complex endgames (23 games)

PREFACE

We are proud to present “Most Instructive Endgames of 2016”, the continuation of last year’s successful starter “Most Instructive Endgames of 2012–2015”.

It was very interesting work trying to select and analyze the 70 most instructive endgames from the past year: the choice was wide and even the simplest-looking endgames have their hidden beauties! We were aiming to find the most instructive, interesting and, of course, useful endgame ideas — those which might also occur in our own practical games.

The main idea behind this book stands out clearly: we try to reduce the importance of endgame table-base analyses or many other forms of computer help, and rather get inside the workings of the best chess-playing brains on the planet, in an attempt to explain the most complex endgames ideas in a way that is simple and understandable to any chess lover.

Another very important point of the book which we are proud of is, we have not used much ‘engine’ assistance during our commentary on the games. We try to see the game the way we would do in a practical game, which makes the commentaries very special — and which in practice puts the reader fully in the shoes of world-class players; and this is exactly the best way to improve our own chess level.

Sadly, nowadays, we have more-and-more computer analyses and we can even hear chess amateurs judging the play of Carlsen, having analyzed some particular endgame till the very end. Yes, you can make a very deep engine analysis at home — but the question is, can you do the same during your practical game over the board?! Chess is a game where everyone makes mistakes — and this is what it is all about in the current book!

We would advise all our readers to take out a real chessboard and enjoy these beautiful masterpieces. This is how we learned to play chess and this is why we still enjoy every wonderful game, even after almost 20 years of being professional chess players!

Yours, Arkadij Naiditsch & Csaba Balogh

1. PAWN ENDGAMES

■ GAME 1

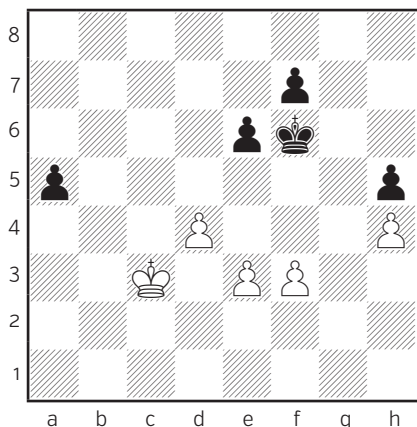
▷ I. Ivanisevic (2643)

► A. Volokitin (2624)

Vidmar Memorial

24.06.2016

Annotated by Csaba Balogh



We have reached this pawn endgame after trading a pair of rooks on c3. The material is balanced, but the question is — who has calculated and evaluated the arising position better? White, who thought that he was soon going to win the a5 pawn? Or Black, who believed that he was going to have a distant passed pawn — which will deflect the white king to the queen-side — in the meantime finding a way for his king to attack the pawns?

43...♔e7!

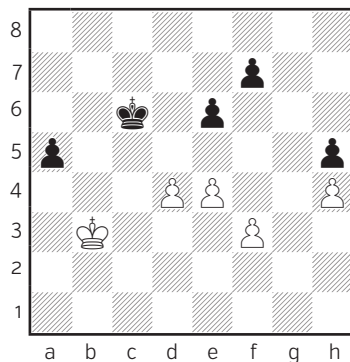
After this move it all becomes clear. Black wants to head towards the e3-pawn via d6-d5-c4-d3 while the white king picks up a5.

The same strategy with 43...e5? loses to 44.d5!+- and White creates a protected passed pawn by playing e4 next move and he can simply win the a5-pawn afterwards.

44.♔c4

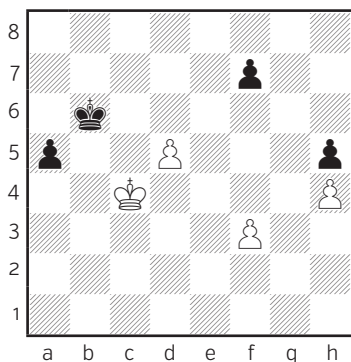
If White comes from the other direction with 44.♔b3 ♔d6 45.e4 (45.♔a4 ♔d5 is the same as the game.)

45...♔c6



Black successfully protects his a-pawn and maintains the material balance and we have reached a classic example on the distant passed pawn. 46.♔c4 (If 46.♔a4 ♔b6 47.f4 ♔a6-+ Black just waits with ...♔a6-b6 until White runs out of moves, when he

could proceed with ...♔b5.) 46...♔b6 Here again, Black just intends to wait with ...♔c6-b6. If the white king retreats then ...♔b5 wins, while White will soon run out of useful pawn moves. 47.d5 exd5+ 48.exd5



(48.♔xd5 ♔b5 Black promotes his a-pawn faster. 49.e5 a4 50.f4 a3 51.f5 a2-+) 48...♔c7! The typical execution of a distant passed pawn. Black trades his a-pawn for the one on d5 and his king will be closer to the kingside pawns. 49.♔c5 a4 50.♔b4 ♔d6 51.♔xa4 ♔xd5-+

44...♔d6 45.♔b5 ♔d5 46.♔xa5 ♔c4 47.♔b6

White tries to rush towards the f7 pawn, but he is a tempo behind.

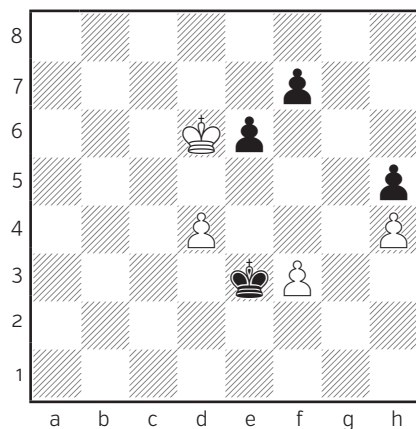
47...♔d3 48.♔c5

48.e4 also loses to 48...♔xd4 49.♔c6 ♔e3-+

48...♔xe3 49.♔d6

The last critical position from Black's point of view. Which pawn should be captured? Only one of them is winning. Of course, this is just an easy

calculation problem which is solved effortlessly by Black.



49...♔xd4!

49...♔xf3 leads to a draw after 50.♔e7 ♔e4 (50...♔g4 51.♔xf7 ♔xh4 52.♔xe6= the pawns promote at the same time.) 51.♔xf7 ♔xd4 52.♔xe6 ♔e4 Black wins the h-pawn, but White manages to squeeze the king to the h-file with 53.♔d6 ♔f4 54.♔d5 ♔g4 55.♔e4 ♔xh4 56.♔f3=

50.♔e7 f5!

The only winning move again, but it was already easy to find.

51.♔f6

White tries to avoid losing a tempo by taking on e6 and instead hurries towards the h5 pawn.

51.♔xe6 loses to 51...f4! 52.♔f5 ♔e3 53.♔g5 ♔xf3 54.♔xh5 ♔e4 55.♔g6 f3 56.h5 f2 57.h6 f1♔ 58.h7 If the king was on g7, the game is drawn, but here Black can play 58...♔f8-+

51...♔e3 52.♔g5 ♔xf3 53.♔xh5 ♔g3
54.♔g5

The pawns promote at the same time, but we should always calculate a move further after the promotion.

54...f4 55.h5 f3 56.h6 f2 57.h7 f1♔
58.h8♔ ♔f5+ 0-1

White resigned as ...♔h3 trades queens next move, followed by making a new queen with the e-pawn.

■ GAME 2

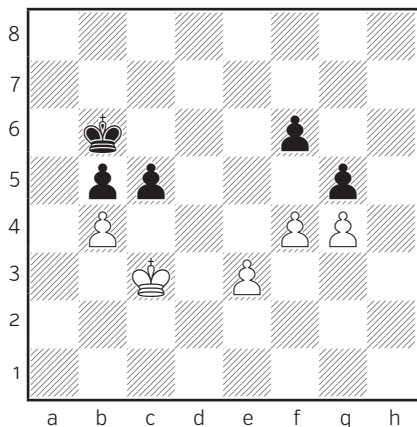
▷ A. Demuth (2545)

▷ J. Jolly (2361)

French Championship

17.08.2016

Annotated by Csaba Balogh



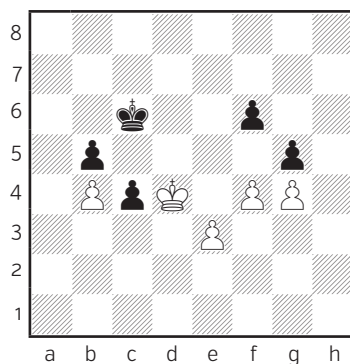
A very instructive pawn endgame. The material is balanced, but it is clear that Black is fighting for the win because of his distant passed pawn on the queen-side, which might eventually also become a protected passed pawn after ...c4. We know that passed pawns play

a key role in almost all endgames. On the other side, White cannot create a passed pawn because Black keeps the tension with the f6-g5 pawns.

50...♔c6?!

This allows White to save the game in a relatively simple way. Black should have created a protected passed pawn with 50...c4! when 51.f5! transposes to the game.

a) 51.♔d4 ♔c6

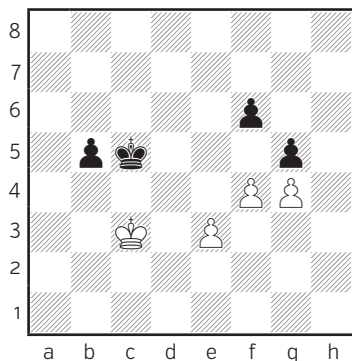


White runs out of moves as he cannot use his king, which must stay with the c4-passed pawn. If he returns with ♔c3, then Black proceeds with ...♔d5. The only move is f5, which transposes to the game. The pretty tactical point is that after 52.♔e4, if White tries to avoid the ♔d5 plan, Black creates a second passed pawn with the nice breakthrough 52...f5+! 53.gxf5 g4+;

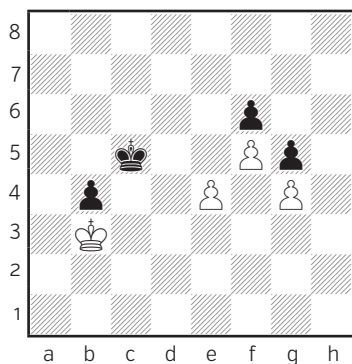
b) If White tries the breakthrough himself, he loses the pawn race after 51.e4 gxf4 52.e5 fxe5 53.g5 f3! 54.♔d2 (54.g6 f2 55.g7 f1♔ 56.g8♔ ♔c1#) 54...c3+-+ as Black promotes first.

51.f5

White could have saved the game in an easier way after 51.bxc5! ♖xc5



Black has a distant passed pawn. There are two possible winning plans, but neither of them seems to work after some forced lines. The first attempt might be to advance the b-pawn with the help of the king, stalemate White after pushing the pawn to b2 and forcing White to make a decisive weakening on the kingside. The other typical plan is to deflect the white king by sacrificing the b-pawn, meanwhile collecting the other pawns with the king. However White holds the draw now by playing 52.f5! ♖d5 (If 52...b4+ 53.♖b3 ♖b5 White has 54.e4! ♖c5



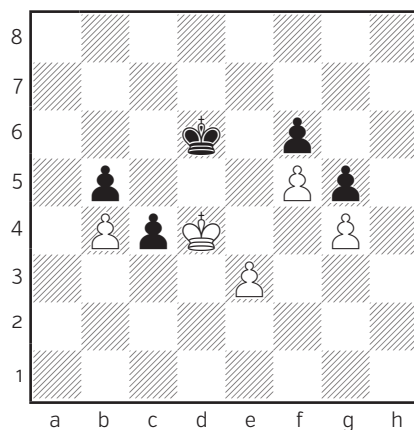
55.e5! fxe5 56.f6 ♖d6 57.♖xb4 ♖e6 58.♖c4 ♖xf6 59.♖d5= just in time and White restores the material balance next move.) 53.♖b4 ♖e4 54.♖xb5 ♖xe3 (Another attempt is to avoid losing a tempo by taking on e3, but it does not change the outcome... 54...♖f3 55.♖c4 ♖xg4 56.e4 ♖f4 57.♖d5 g4 58.e5! the pawns are promoting at the same time. 58...g3 (58...♖xf5 59.e6 g3 60.e7=) 59.exf6=) 55.♖c5 ♖f4 56.♖d5 ♖xg4 57.♖e6! White again arrives in time and the pawns promote on the same move. 57...♖h4 58.♖xf6 g4 59.♖e6 g3 60.f6 g2 61.f7 g1♗ 62.f8♗ =

51...c4!

Creating the protected passed pawn. Black intends to invade with ...♖d5-e4 with an automatic win, therefore White should try to block its way...

52.♖d4 ♖d7

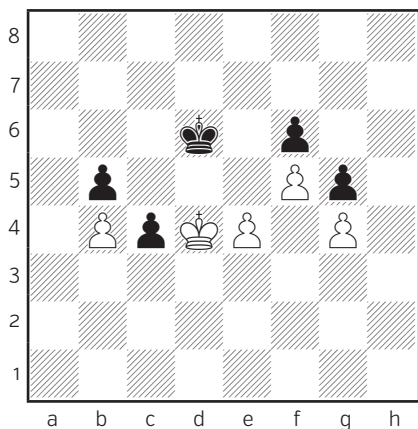
Just a repetition of moves, Black goes ...♖d6 soon.

53.♖c3 ♖c6 54.♖d4 ♖d6

55.e4!

The only move! At first sight it looks easy, but difficult calculation was required. The point is that after executing a triangulation with the king, White finds himself in zugzwang...

If White starts to wait with ♔e4-d4 , he loses the game after 55. ♔e4 c3! sacrificing the pawn in order to invade with the king; classical use of the passed pawns... 56. ♔d3 ♕e5 57. ♕xc3 ♕e4 58. ♔d2 ♕f3 59. ♔d3 ♕xg4 60. e4 ♕f4-+ with an easy win for Black.

55... ♕e7 56. ♔c3 ♕d7 57. ♔d4 ♕d6!

Black has done his job by giving the right to move to White. If he can get his king to e5, the game would be immediately over after advancing the c-pawn.

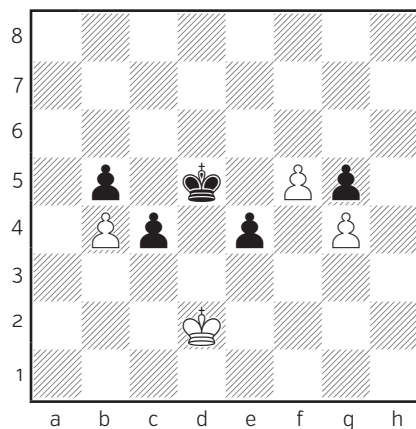
58.e5+!

A great resource! White sacrifices the pawn in order to create a protected passed pawn of his own! He aims to hold the black pawns with his king and makes use of the fact that

the black king cannot support them, because he must stay with the f-pawn.

58...fxe5+ 59. ♔e4 ♕d7!

Black proceeds once again with a triangulation.

60. ♔e3 ♕e7 61. ♔e4 ♕d6 62. ♔e3 ♕d5 63. ♔d2 e4**64. ♔e3??**

A miscalculation after which the game is lost. The correct move was 64. ♔d1! followed by waiting with ♔d2-d1 . Whenever Black advances one of his pawns, White can immediately go for it with the king. Black has no chances to play for the win without being able to cross the middle of the board with his king.

64...c3! 65. ♔e2

The problem is, White cannot play ♔d1-c2 , as after ♔d1 e3 he finds himself in zugzwang. Black executes another triangulation, giving the move to his opponent to lure the king to the poisoned square...

65...♔d6! 66.♔e3 ♔e5! 67.♔e2 ♔d5!

Here we are! White is in zugzwang.

68.♔e3

68.♔d1 e3-+

68...♔c4!

This is the point! Black can allow the f-pawn to run, because he promotes his c-pawn faster with the help of the king, thanks to the fact that it queens with check.

69.f6 c2 70.♔d2 ♔b3 71.f7

71.♔c1 e3 is also over. 72.f7 e2-+

71...♔b2

71...e3+-+ was also winning on the spot.

72.f8 ♔ c1 ♔+ 73.♔e2 ♔c2+ 74.♔e1 ♔c3+ 75.♔e2 ♔d3+ 0-1

White resigned. Black has many winning lines, but the easiest is to simplify into a pawn endgame... 75... ♔d3+ 76.♔f2 ♔f3+ 77.♔xf3 exf3 78.♔xf3 ♔c3 Black wins the pawn race by a decisive tempo. 79.♔e4 ♔xb4 80.♔f5 ♔c5 81.♔xg5 b4 82.♔f6 b3 83.g5 b2 84.g6 b1 ♔ 85.g7 ♔a2-+

2. TRANSPOSING INTO PAWN ENDGAMES

■ GAME 1

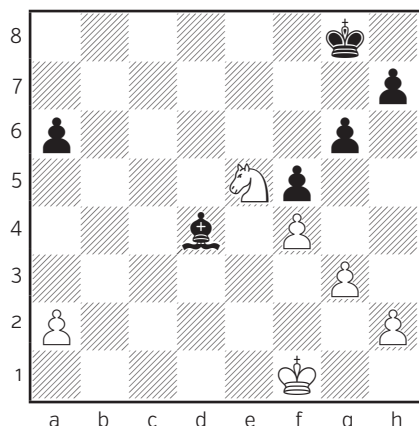
▷ S. Ivanov (2556)

► M. Krasenkow (2610)

Rilton Cup

01.01.2016

Annotated by Csaba Balogh

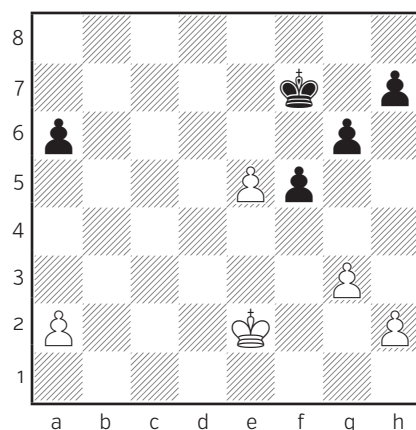


We are very close to a draw, when suddenly White takes an extremely risky decision by allowing Black to take on e5.

39.♙e2?

Objectively not losing, but it is a very strange decision to give Black such a chance to go for the pawn endgame. After the natural 39.♘f3, followed by bringing the king to the light squares, the game would have ended in an inevitable draw.

39...♙xe5 40.fxe5 ♔f7

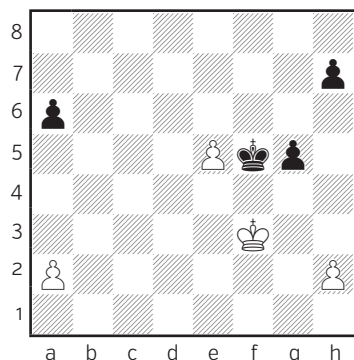


It is a very interesting task to analyze this pawn endgame. After a brief look we can see that the passed pawn on e5 is rather weak and it is Black who is going to have a distant passed pawn after ...g5 and a later ...f4, therefore he is the one playing for the win.

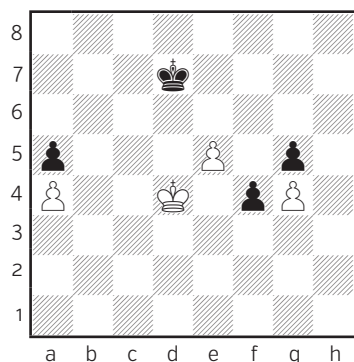
41.♔e3?

This is the decisive mistake, but it was already very difficult to hold in a practical game. The only move was 41.♔f3! g5! Black should prevent ♔f4, just like in the game, however the big difference here is that White has the option of playing g4! (41...♙e6 does not create real problems for White. 42.♔f4 ♙d5 43.h4 ♙e6 The idea is to place White into zugzwang by simply waiting with king moves and e5 falls at the end, but

White can create counterplay by going for the h7 pawn. 44.♔g5 ♕xe5 45.♔h6 and the game is drawn. 45...f4 46.gxf4+ ♕xf4 47.♔xh7=) 42.g4! f4 A protected passed pawn is usually a big trump in all endings, but here it is insufficient to win the game. (The alternative is 42...♔e6 but White is just in time to save the game with 43.gxf5+ ♕xf5



44.e6! ♕xe6 45.♔g4 ♔f6 46.♔h5 and Black cannot save his extra pawn, ♔h6 comes next and the game is drawn. 46...♔f5 47.♔h6=) 43.h4 h6 44.hxg5 hxg5 45.♔e4 White waits on the e4-d4-d3 squares with his king, giving protection to the e5 pawn and staying close enough to the f-pawn. 45...♔e6 46.a3 a5 47.a4 ♔e7 (47...f3 48.♔xf3 ♕xe5 49.♔e3= White holds the opposition.) 48.♔d4 ♔d7



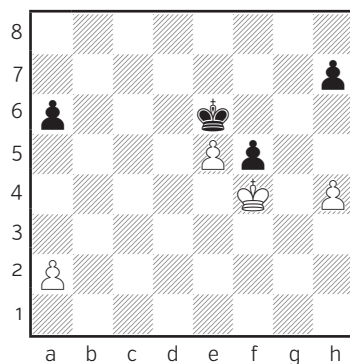
49.♔d3!= It is very important to realize that White must play ♔e4 only when the black king goes to e6! (The reason is 49.♔e4? ♕e6 50.♔d4 White finds himself in zugzwang and he has to leave the f4 pawn, which allows Black to win the opposition after 50...f3! 51.♔e3 ♕xe5 52.♔xf3 ♔d4-+) 49...♔e7 50.♔d4!= avoiding again the ♔e4-♕e6 trap.

41...g5!

In the 41.♔f3 ♕e6 line, we already saw that allowing the white king to go to f4 leads to a draw. 41...♔e6 42.♔f4=

42.h3

White has just realized that he should play g4, but he has lost a decisive tempo. 42.h4 also loses: 42...gxh4 (42...h6 wins as well.) 43.gxh4 ♕e6 44.♔f4



We have reached a position where the side who runs out of pawn moves loses. The one who needs to move with his king loses the f5 or the e5 pawn and the game. In such cases a very important rule to ease our calculation is that both sides must push the pawns which have already

moved. The pawn is already on a6, therefore Black must advance that pawn. (44.♔d4 a5 leads to the same zugzwang positions as the 44.♔f4 a5 line.) 44...a5! 45.h5 White also follows the principle, but it doesn't help him. (45.a4 h5 46.♔g5 ♖xe5 47.♔xh5 ♔f6 48.♔h6 f4-+; 45.a3 a4 46.h5 h6-+) 45...a4!-+ Following the principles again! A clear example is that if Black plays 45... h6 instead, then 47.a4 wins for White! Now if White pushes h6, a3 wins, or in case of a3, h6 wins for Black.

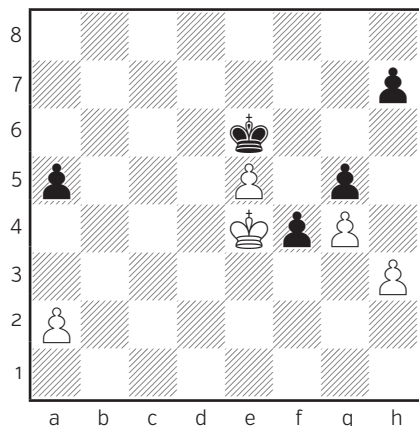
42...♔e6 43.♔d4 a5!

Krasenkov follows the same principle that we already know from the 42.h4 line. He moves the pawn which has already left its initial position.

44.g4

44.a4 h5-+ is zugzwang for White.

44...f4 45.♔e4



45...f3!

Precise calculation! It is important to save all the tempi (...h6 and ...a4) for setting White into zugzwang in the future. 45...a4 allows White to play 46.h4 h6 47.hxg5 hxg5 48.a3 with the same draw that we already discovered in the 41. ♔f3 g5 42.g4 line!

46.♔xf3 ♔xe5 47.♔e3 a4!

But not 47...h6 because of 48.a4=

48.a3

48.♔f3 ♔d4-+;

White loses the pawn race after 48.♔d3 ♔f4 49.♔c4 ♔g3 50.♔b4 ♔xh3 51.♔xa4 ♔xg4 52.♔b4 h5-+ and the h-pawn promotes first and covers the a8 square.

48...h6!

The decisive tempo and White is lost!

49.♔e2

49.♔d3 ♔f4 is the same as in the 48.♔d3 line.

49...♔e4 50.♔f2 ♔d3 51.♔f3 ♔c3 52.♔e4

White resigned! An instructive endgame to learn from.

52...♔b3 0-1