

A first survey of Losing Chess endgame material published up to the end of 1999

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“The endgame is the most appealing stage of the game, a garden of surprises,” wrote David Pritchard about Losing Chess in *The encyclopedia of chess variants* (1994). However, the literature of Losing Chess is sadly fragmented (a typical mainstream chess magazine carries an article perhaps once every twenty years), and all too many composers and writers, myself included, have spent time and effort rediscovering what had already been published. This document is therefore a first attempt to list published material relating to endgame theory and endgame studies. I think it is reasonably complete as regards what has been published in England (I have excluded articles that merely quote earlier work), but it is less complete in respect of foreign material and its coverage of Russia and Eastern Europe is almost nil. Even so, it seems to me more useful to publish the document as it now is and to let others build on it than to hold it back while yet further researches are made. Given the recent computer-inspired explosion of activity in Losing Chess, the cut-off date is by no means ideal, but it is numerically convenient and I have imposed it in order to crystallize matters.

The document comprises a list of **articles and studies in approximate date order** (items within the same year being arranged in alphabetical order of author), a list of **definitive analyses by computer**, and an **index by material covering positions with up to five men** (on pages 30-32). My thanks are due to Ralf Binnewertz, Paul Byway, Chris Feather, George Jelliss, Jörg Kuhlmann, Fabrice Liardet, Cedric Lytton, David Pritchard, Ken Whyld, Peter Wood, the library of the British Chess Problem Society (BCPS), and the Kokinklijke Bibliotheek in Den Haag for material (the contributions of Ralf Binnewertz, Chris Feather, and Fabrice Liardet have been particularly valuable), and to Chris Feather and a singing friend known to me only as Ursula for translations. Round brackets (...) mean that I have relied on a quotation or transcription, square brackets [...] that I am merely reporting a reference and have not seen the item at all. Obvious and unimportant misprints have been ignored or silently corrected, and notation has been standardized even within quotations. Readers should be aware that I can read only English, French, Czech, and Slovak, and that interpretations of material in other languages may be no more than deductions from diagrams, moves, and isolated words looked up in dictionaries.

The distinction between “problems” and “endgames” in Losing Chess is not always clear, but I am treating anything with five men or less as an endgame, and some compositions with more men appear also to deserve inclusion. Positions from play are included only if they have some particular interest. Compositions requiring retrograde analysis are normally excluded, as are positions using other than the normal board and men, but there are a few exceptions in each class. Unless otherwise stated, I assume the rule that stalemate is a win for the player stalemated. Alternative solutions known to me are reported, except where uniqueness of solution is not an issue, but I have made no attempt to verify the correctness of every example. The advent of Stan Goldovski’s program *Giveaway Wizard* should mean that most material published from mid-1998 onwards can be taken as correct (running on a 450MHz Pentium III, the program once took less than three seconds to give a definitive verdict on an ending with which I had struggled unsuccessfully for several weeks), but I have not systematically tested earlier material.

I have no authority to waive the rights of others, but in so far as anything in this document is original with myself it may be copied without payment or formality; I ask only that there be due acknowledgement. And if anyone wishes to incorporate what follows into a more extensive survey, he may do so with my good will.

Articles and studies

- 1885 Verney, G. H. *Chess eccentricities*, 1885, article “‘Take me’ Chess, invented by Walter Campbell, and played at Boyton Lodge, Wilts, in 1876” within a section “Social Chess” (p 191). The earliest description of the game known to me. The rules are broadly as at present, but the result in the event of stalemate is not defined, promotion is to “any Piece ... which has already been lost”, and only active sacrifices are specified as compulsory (“If a player places one of his Pieces in such a position that his opponent can take it, he can insist on his antagonist taking it by saying the words ‘Take me;’ and the antagonist is bound to take the Piece in the manner the player desires”).

There is no specimen game, but the final paragraph is worth quoting in full:

“A curious feature of this game is that not until almost the last move can it be guessed which player will win; for it often occurs that when a player has only one Piece left on the board, his antagonist may by careful play cause this one Piece to take all his own Pieces which may be left.”

So the subtlety of Losing Chess endings was recognized even at this early stage.

- 1901 Schellenberg, P. *Dresdner Schach-Kalender* (a booklet produced to celebrate the 25th anniversary of the Dresden Chess Association), 1901. A game-like ending: White Bg2, Pf7/a6/c5/d4/e4 (6), Black Ra8, Bg3, Pa7/h5 (4), White to play and win. I have seen only (a) a copy of the front and back covers,

the position quoted appearing on the back cover under the heading “Schlagschach - Studie” with the stipulation “Weiß am Zuge gewinnt”, (b) a copy of the contents page, which lists nothing apparently relevant, and (c) a copy of the section “Bemerkungen zu dem Titelbildnis” (pp 39-41 according to the contents page, pp 43-45 in reality) which I thought might throw further light but in fact talks only about an ordinary problem on the title page and does not mention the back cover at all. It therefore appears that the study appeared without solution. Klüver, assuming passive captures to be compulsory, gives 1 e5 Bxe5 2 Bxa8 Bxd4 3 f8Q Bxc5 4 Qxc5 h4 5 Qxa7 h3 6 Bg2 hxg2 7 Qf7! in his 1924 *Deutsches Wochenschach* article (see below), and the manuscript copy in a private collection of problems compiled by T. R. Dawson spells out the details: 7...g1K 8 Qf2 Kxf2 9-10 a8R, or 7...g1N 8 Qf3 Nxf3 9-10 a8N (a8R would also do). Fabrice Liardet points out that 6 Be4 h2 7 Bd3 also works, for example 7...h1B 8 Be4 Bxe4 9 Qa8 Bxa8 10 a7. The name of the editor and presumed composer of the study does not appear in the material I have seen, and I am relying on Klüver for it.

- (1914) Markwick, F. W. *Stratford Express*, 19.xii.1914. A position from a game, after 1 e4 f5 2 exf5 e6 3 fxe6 dxe6 4 Qg4 Qxd2 5 Nxd2 Ba3 6 Qxe6 Bxb2 7 7 Qxe8 Bxc1 8 Qxg8 Rxc1 9 Rxc1 Bh3 10 Nxh3. Black now wins by successive sacrifices: 10...b5 11 Bxb5 Re8 12 Bxe8 Nd7 13 Bxd7 Re8 14 Bxe8 g5 15 Nxg5 a5 16 Nxh7 c6 17 Bxc6 a5 18 Bxa5. This is the earliest complete game known to me, and again we notice that passive captures (4...Qxd2, 6...Bxb2, etc) were treated as compulsory. Supplied to me from the Dawson collection.
- 1923 Klüver, H. *Chess Amateur*, iv.1923. Six studies.
- White Ke3 (1), Black Nd7 (1), White to play and win. 1 Kd3 Nf8 2 Ke4 Nh7 3 Kf3 Nf8 4 Kf4, or 1...Nb8 2 Kc4.
 - White Rc6, Ne4 (2), Black Ke8 (1), White to play and win. 1 Rg6 Kd8 2 Rf6 Kc8 3 Re6 Kb8 4 Rd6 Ka8 5 Rc6, any other Black move allowing a quicker win.
 - White Pa4/a7 (2), Black Ka5 (1), White to play and win. 1 a8N Kxa4 2 Nb6.
 - White Ph6 (1), Black Nd6 (1), White to play and win, also Black to play but White to win. White to move, 1 h7 and 2 h8N; Black to move, 1...any 2-3 h8B. Specimen wins are played out in each case.
 - White Pa7 (1), Black Na5/d6 (2), White to play and win. 1 a8K.
 - White Pf7 (1), Black Ra1/a2 (2), White to play and win. 1 f8B.
- (1923) Roese, W. Source not known to me (quoted in Boyer's *Les jeux d'échecs non orthodoxes*, 1951). White Rd1, Nh2, Pc2 (3), Black Bf6, Pb4 (2), White to play and win. 1 Ra1 Bxa1 2 c4 bxc3 3 Nf3.
- 1923 Watney, G. C. *Chess Amateur*, iv.1923 (from play). White Pe7 (1), Black Nd7, Pf7/h7/h6 (4), White to play and draw. 1 e8K! (“any other move loses”) Nf6! (“again any other move loses”) 2 Kxf7 Ng8! 3 Kxg8 h5 4 Kxh7 h4 5-6 Kh5 h2 7 Kg4! h1K! (“any other promotion losing”), with Dawson's exclamation marks throughout.
- 1924 Dawson, T. R. *Deutsches Wochenschach*, 31.v.1924 (dated from Dawson's notebooks in the BCPS Library). White Rb3, Bf2, Na2/b1, Pe4/g4/d3/g3/c2/g2 (10), Black Bf7 (1), can White win? The answer is Yes, despite the inability of White's dark-squared bishop to sacrifice itself to Black's light-squared: 1 Rb6 Bxa2 2 Rg6 Bxb1 3 g5 Bxc2 4 g4 Bxd3 5 Bh4 Bxe4 6 g3 Bxg6 and White is stalemated. There is a reference to a famous orthodox chess endgame by J. G. Campbell in which White draws similarly (no details are given, but I have seen such an ending quoted elsewhere as *Chess Player's Chronicle*, iii.1855, White Kb5, Bg5, Pb6/a4/d4/b2 (6), Black Kf1, Pb7/d6/d5/g3/h3 (6), draw by 1-2 Ba5 and 3 b4). See also Dittmann 1987 and Nagorko 1999.
- 1924 Klüver, H. *Deutsches Wochenschach*, 31.v.1924 (no date on the extract seen by me, but dated thus in Dawson's notebooks). Article “Schlagschach” (pp 89-91) in a series “Feenspiele”. A general article covering all aspects of the game. Items relating to the endgame are as follows.
- A general discussion of the endgame, with a summary of one-against-one piece endings. The rook is generally the strongest piece in the ending; the short-range pieces (K and N) are much weaker than the long-range; K loses against Q or R, being driven to the edge and then defeated by zugzwang; K draws against B, provided only that it does not get trapped against the edge with the bishop facing it two squares away (the exceptional draw with Kb1 v Bb4 is not noted); N loses against all other pieces, being driven to the edge by K and defeated by zugzwang, while a long-range piece can attack it and then sacrifice on the square from which it has just moved away; N v N is won by the player to move when the knights are on squares of the same colour. The exceptional wins with N v K, N v B, and N v R are not explicitly noted, but one of the studies that follows exploits an exceptional win with N v K.
 - Some information on three-piece endings. 2N v N is a win for the lone N (later discovered not to be

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the case, see Fabel 1947); KR v K, KQ v K, KB v K, KN v K are normally drawn with best play; QN v K and RN v K cannot normally win.

- Five of the 1923 Klüver studies from the *Chess Amateur* (Ke3 v Nd7 is the one omitted).
- A challenge to chess mathematicians to give a general formula for the 2N v 2N ending on an $n \times n$ board.
- The Schellenberg 1901 study and the Dawson study mentioned above.
- A 1923 correspondence game between Klüver and Dawson. This came down to an ending with White Pg6/f2 (2) against Black Bd5/b4, Pd7/c4/f3 (5), Black to play his 28th move, which Dawson (Black) won by 28...Be4! (Klüver's exclamation marks throughout) 29 g7 Bg6! 30 g8R (best, because 30 g8Q/B/N allow easy wins and 30 g8K leads to 30...Bf8 31 Kxf8 Be8 32 Kxe8 c3 33 Kxd7 c2 34 Kd6 c1B! 35 Kd5 Be3 36 fxe3 f2 and 37...f1R with a win) Bd2 31 Rxc6 d6 32 Rxd6 Be3! 33 fxe3 f2! and White resigned. Klüver spells out the reason: 34 e4! f1R! 35 e5! (not 35 Rd1 on account of 35...Rxd1 36-38 e7 c1R and wins) c3! 36 e6! c2! 37 e7 Rd1 38 Rxd1 cxd1R and wins, or 34 Rd1 c3! 35 e4! (not 35 Re1 on account of 35...fxe1B 36 e4 Bh4 37 e5 Bf6 38 exf6 c2 39 f7 c1R etc) c2! and wins, for example 36 Re1 fxe1B 37 e5 Ba5 etc. Not given by Klüver, but in Dawson's notebooks, is the simplest refutation of 30 g8N: 30...Ba5! and any White move will allow four sacrifices.

(1925) Dawson, T. R. *Deutsches Wochenschach*, 15.iii.1925. Two items.

- White Pf6/h6/b5/h5/b4/f4/h4/a2 (8), Black Pb7/c7/f7/h7/a5/a4/a3 (7), White to play and win. The obvious 1 bxa5 loses, but Black's last move must have been a7-a5 and so the winning *en passant* capture 1 bxa6 is available. This and Dawson 1934 were reprinted in Dawson's *Caissa's wild roses* (1935).
- White Rb3/h3, Pe2 (3), Black Be5 (1), White to play and win. 1 Rb2 Bxb2 2 Rh8 Bxb8 3 e4; not 1 Rh2 Bxb2 2 Rb8 Bxb8 3 e4, after which the bishop can escape to a7.

Taken from the Dawson notebooks (problems 2211 and 2240).

(1929) Törngren, P. H. *Tidskrift*, xi-xii.1929. White Ph2 (1), Black Pa6 (1), White to play and win. Supplied to me from the Dawson collection, where the solution is given as 1 h3 a5 2-5 h7 a1R/N 6 h8B; the companion line 5...a1K 6 h8R is not given, but it is a routine win whereas the win with Bh8 v Ra1 is an exception to the normal rule. The diagram in the Dawson collection has a note "cf. V. Onitiiu", but I do not know to what this refers.

(1930) Sunyer, J. *Els Escacs a Catalunya*, viii.1930. White Nc5/h4/c3 (3), Black Pe3 (1), White to play and win (yes, three White knights). Supplied to me from the Dawson collection. Dawson gives no solution and Ken Whyld tells me that there appears to be none in *Els Escacs a Catalunya*, but I play 1 Nb5 e2 2 Nd4, after which promotions to K, Q, or R lose at once, 2...e1B allows 3 Nc2 Bxb4 4 Ne1 Bxe1 5 Ne6, and 2...e1N allows 3 Ng2 Nxc2 4 Ne4 with two more sacrifices to follow. Fabrice Liardet sends me a second solution, discovered by computer: 1 N3e4 e2 2 Ne6 e1B (if 2...e1N then 3 Ng2 Nxc2 4 Nd4 transposing into my solution) 3 N4c5/Nd8 Bxb4 4 Nd8/Nc5 Bxd8 5 Nd3.

1934 Dawson, T. R. *Problemist Fairy Supplement*, xii.1934. On an $n \times n$ board, set up rows of n pawns one square apart; who wins? This was inspired by Klüver's two-against-two pawn study described below, and proves to be unexpectedly deep. Dawson originally thought he had found a systematic solution valid for all n , but by the time he came to write *Caissa's wild roses* in 1935 he had realized his error; a complete solution is yet to be found, and may well not exist. Although atypical as a chess problem, the problem has attracted attention in the literature of mathematical games, and an excellent account can be found in *Winning ways for your mathematical plays* (Berlekamp, Conway, and Guy, 1982).

1934 Fabel, K. *Problemist Fairy Supplement*, viii.1934. White Rc1, Ba6, Pd4/a2/c2 (5), Black Pd2 (1), White to play and draw. Given as best is 1 a4 forcing 1...dxc1B, any other Black move losing. 1 d5 and 1...Bc4 are also given as drawing, "but with fewer winning chances". This is described as "from play, versus H. Klüver", but a note on the manuscript diagram in the Dawson collection describes it as "based on" actual play.

1934 Klüver, H. *Problemist Fairy Supplement*, x.1934. Two studies.

- White Ra1, Bh5 (2), Black Kd5 (1), White to play and win. "There is no immediate win, and many ways of winning, but the point is that R must be given up before B or else White loses" (thus the source, but "cannot win" is obviously meant). Given as a typical line is 1 Rf1 Kd4 2 Rf2 Kd5 3 Rf3 Kd6 4 Rf4 Kc6 5 Bg6 Kc7 6 Rf5 Kc8 7 Re5 Kc7 8 Bf7 Kc8 9 Re6 Kb8 10 Be8 Ka8 11 Rc6. This has proved to be one of the most important three-piece endings; it lies at the heart of the standard winning procedure for two or more pawns against a distant king (see Leoncini and Magari 1980),

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and often arises in other contexts as well.

- White Ph4/f2 (2), Black Pf7/h6 (2), White to play and win. 1 h5 f6 2 f4, or 1...f5 2 f3. This is almost trivial, but the Dawson study which it inspired (see above) was not.
- 1935 Slater, E. (presumably E. T. O.) *Problemist Fairy Supplement*, ii.1935. White Bf8, Nf6 (2), Black Kf7, Pd7/h7 (3), White to play and win. 1 Nxh7 Kxf8 2 Nxf8 d5 3 Ng6 d4 4 Nh4 d3 5 Ng2 d2 6 Ne1, or 2...d6 3-7 Ne4 d1B 8 Nd6. The point is that 1 Nxd7 Kxf8 2 Nxf8 doesn't work because Black can play 2...h6! and meet 3-7 Ng4 h1B 8 Nh6 by 8...Bc6. This is described as "the one exceptional win" with N v B, but Na2 v Bc1 (not reachable from this position) provides a second.
- (1938) Dawson, T. R. *Stratford Express*, 23.xii.1938. A forced-capture problem with eleven men against two (wKg2, Qf5, Bh1, Ne4/h3, Pa5/a4/d4/h4/e2/h2, bBa3, Pb7) ending in a win by stalemate (1 Nd6, 2 Kf3, 3 Ng1, 4 Bg2, 5 Qf6, 6 Bf1, 7 Kf2, 8 e3, 9 Ba6). Quoted in *The encyclopedia of chess variants* (Pritchard 1994), and dated from the Dawson notebooks in the BCPS Library. In 1977, Panteleit showed an alternative win not depending on stalemate (1 a6, 2 Nd6, 3 Kf3, 4 Kg3, 5 Qc2, 6 Ng5, 7 e3, 8 Bc6, 9 Qc3, 10 a5, 11 Bb5).
- 1938 Niemann, J. *Fairy Chess Review*, xii.1938. A one-against-one nightrider study on a 10 x 10 cylindrical board. This is not really within the intended scope of this document (the "nightrider" is a fairy chess piece which moves along straight lines of squares a knight's move apart), but like Dawson 1934 it is an interesting example of what is possible on a larger canvas. White is on f1, Black on a9. Black to play is dominated (for example, if he tries a five-step move around the cylinder, a9-c8-e7-f6-i5-a4, White plays a nine-step move to d10 or h10, say f1-h2-j3-b4-d5-f6-h7-j8-b9-d10, and Black must capture). White to move plays to f6, say f1-h2-j3-b4-d5-f6, and the equivalent nine-step move is not available to Black; he has nothing better than a9-c8-e7-g6 or the symmetrically equivalent move a9-i8-g7-e6, and White's reply f6-h5-j4-b3 or f6-d5-b4-j3 again leaves him dominated.
- 1947 Fabel, K. *Am Rande des Schachbretts*, 1947, chapter "Schlagschach" (pp 28-33). A general article including studies, game positions, and observations. Chris Feather translates some passages on knight endings. Page 30: "The endgame of two knights against one is especially interesting. It was described as a win for the single knight by Klüver in his introductory essay in *Deutsches Wochenschach* but actually it is a draw, a point to which I shall return." Page 33: "Finally a further look at the endgame of two knights against one, which with best play is a draw. Let White have the single knight. There are three distinct cases in all.
1. All three knights on squares of the same colour. White to move plays towards the other knights; Black to move cannot afford to put a piece en prise.
 2. The Black knights are on squares of the same colour, the White on the other colour. White to play moves to allow Black to put a piece en prise, while attacking the largest possible number of squares controlled by the Black knights; Black to play moves to the square at 2-2 from the White knight.
 3. The Black knights are on squares of different colours. White to play must not allow Black to put a piece en prise; Black to play can afford to play en prise, otherwise he should play to a square at 2-2 from White.
- "The ending of two knights against two is even more complicated, and furthermore is hardly ever seen in practice."
- 1947 Fabel, K. and Klüver, H. *Fairy Chess Review*, x.1947. Two studies.
- White Kf3 (1), Black Kd7, Qc8 (2), White to play and win. 1 Ke4 Qd8 2 Kd4, and not 1 Kf4/Kg4 on account of 1...Qa6! drawing.
 - White Pa7 (1), Black Kf3, Bh1 (2), White to play and win. 1 a8K Bg2 2 Kb7 Bh1 3 Kc6 Bg2 4 Kd5. "Neither Black K nor B dare leave main diagonal."
- [1947] Frey, R. L. *The new complete Hoyle*. This American publication is said by Boyer in *Les jeux d'échecs non orthodoxes* (1951) to contain relevant material, but I have not seen it.
- (1947) Niemann, J. *Schachmatt*, 28.xi.1947. White Qf3, Pa4 (2), Black Kb6, Na6 (2), White to play and win. 1 a5! (1 Qh3 Kc5, or 1 Qd1 Ka7 2 Qa1 Nc7) Kxa5 2 Qh1 (2 Qg2 Ka4 3 Qh1 Kb3) Ka4 3 Qg2 Ka5 4 Qf3. Taken from *John Niemann / Eine Gedenkschrift* (Büsing and Gruber, 1996).
- 1948 Charosh, M. *Fairy Chess Review*, vi.1948. (i) Given one knight each, who wins and how; (ii) given two knights each, none en prise, same question. The well-known answer is given for one knight each. For two knights each, Charosh claimed that if the total number of knights on one colour was odd, the first player would win, the winning plan being to give up a knight so as to bring the opposing knights to squares of the same colour, in such a way that the remaining knight could threaten to sacrifice itself to either. Example: White Nc1/f1, Black Nc8/g8, play 1 Ne3 Nge7 2 Nc2 Nd6 3 Nd3 Ne8 4 Nc5 Nd6

5 Nd7! and now 5...Nb7 6 Nc5 Nxc5 7 Nb4, or 5...Ndc8 6 Nb6 Nxb6 7 Nb4, or 5...Nf7 6 Ne5 Nxe5 7 Nb4, or 5...Nf5 6 Nd4 Nxd4 7 Ne5. However, this example was challenged by F. Hansson in the x.1948 issue (see below) and a number of exceptions given to the general rule.

1948 Hansson, F. *Fairy Chess Review*, x.1948. "When knights are bold": an article on knight endings. Hansson gives one exceptional study with two knights against one (see Fabel 1947 above), and eight with two knights against two mostly contradicting Charosh. In respect of two knights against one, Hansson says that the conclusion that the ending is generally drawn "must be qualified as the more probable result, as most exceptions are trivial," but he gives the following as "worth noting": White Na1/g5 (2), Black Nh6 (1), White to play and win (1 Ne4 N-- 2 N sacrifices and wins, but not 1 Nf7 when White loses). As regards Charosh's rule with two knights against two, he says, "It is as difficult to disprove that rule as to establish it. Although not completely convincing, the following examples may be sufficient." He then gives eight examples, the published solutions to some of them being reduced to "a dominant line of play out of many". Be it remembered that Charosh's rule amounts to saying that if one side has its knights on squares of the same colour and the other on squares of different colours - a "same-different" position, in the terminology used below - the player to move can win.

- White Nc2/c5, Black Ne7/f6 (this arises in Charosh's example if Black plays 4...Nf6 instead of 4...Nd6), White to play can only draw. 1 Ne6 Nfg8 2 Nc5/Ng5 Nf6 3 Nd7 Nxd7 4 Na3/Na1/Ne1 Nc5/Nf6 draws; 1 Nd7/Ne4 NxN draws; 1 Ne3 Ne4 2 NxN Nc6 draws (thus the source, though 2...Nd5 would win; doubtless 1 Na3 or 1 Ne1 was intended). "Although hard to 'prove' a draw, what is there better."
- White Nf5/f7, Black Nb4/e8. "This position satisfies [the] rule, either first player winning - but not without traps in the play." White to play, 1 Ng7 NxN 2 Nd8 wins; Black to play, 1...Ng7 2 NxN Nd5 wins.
- White Nb2/c3, Black Na5/c6. This again "has either first player winning", but if Nc3 is moved to a3, "we have [the] rule satisfied yet while Black to play still wins, White to play loses." As set, White to play, 1 Nc4 NxN 2 Nb5 wins; Black to play, 1...Nc4 2 NxN Na5 wins. With wN on a3, White to play, 1 Nac4/Nbc4 NxN 2 NxN Na5 wins; Black to play, 1 Nc4 as before wins.
- White Nd1/h1, Black Nb3/f6. "Still in [the same] rule, White to play only draws, Black to play wins." White to play, 1 Nb2! Nd4 2 Na4/Nc4/Nd3/Nd1 Nc6/Ne6/Nb5/Nf3 draws; Black to play, 1...Nd2! 2 Nb2 Nc4 3 NxN Ne4 wins (I have reconstructed a garbled text).
- White Na1/Ne1, Black Nc3/Ne5. In this position, "by Mr Charosh's rule and in fact White to play draws only, but Black to play wins." (This is a same-same position, and by Charosh's rule as stated should in fact be a win for the second player; the first player can only move to a different-same position, which by the rule is a win for the player next to move. Charosh's rule never predicts a draw. There must be a misunderstanding somewhere.) White to play, 1 Ng2 Nb1 2 Nf4 Nd3 3 NxN Nc3 4 Ne5 Nb1 5 Nd3 Nc3 drawn; Black to play, 1...Nd3 2 NxN Nb5 3 Nf2 Nd4 wins.
- White Nc1/e1, Black Nb1/f1. This is another same-same position: "... first player should draw, but in actual fact it is White to play and win, or Black to play will still lose." White to play, 1 Nb3 --- 2 Nd2 NxN 3 Nf3 wins; Black to play, 1...Na3 2 Nc2 NxN 3 Ne2 wins "and so on".
- White Nb1/c2, Black Nb2/c1. Another same-same position. "This time, White to win whether moving first or second, just as above." Moving all four knights two files to the right, to d1/e2 and d2/e1, "the first player draws as in Mr Charosh's rule." As set, White to play, 1 Ne1 Na4 2 Nc3 wins; Black to play, 1...Na4 2 Nc3 NxN 3 Nd4 wins. Two files right, White to play, 1 Ng1 Nb3! 2 Nf3 NxN drawn; Black to play, 1 Nb1 similarly.
- White Nb6/g4, Black Nb1/h8. A different-different position, "White to win, with or without the move." White to play, 1 Ne5 Nf7 2 NxN Na3 3 Nc4 NxN 4 Ne5 wins; Black to play, 1...Na3 2 Nc4 NxN 3 Ne5 wins.

"With these exceptions to Mr Charosh's rule, it is difficult to believe that the four Kt's ending can be reduced to any simple rule."

(1948) Klüver, H. *Schachspiegel*, ix.1948. White Kd3, Re4 (2), Black Kg2 (1), White to play and win. A demonstration of the winning process with KR v K, where it exists: 1 Ra4 Kh3 2 Ke4 Kh4 3 Ra6 Kh3 4 Ra5 Kh2 5 Ke3 (simple and systematic, though the computer shows 5 Rf5 to be quicker) Kh3 6 Rb5 Kh2 7 Rb4 Kh1 8 Ke2 Kh2 9 Ra4 Kg1 10 Ra3 Kh2 11 Rg3, or 1...Kg1 2 Ke4! Kf1 3 Rd4 Kg1 4 Kf4 (4 Rd3 is quicker) Kf1 5 Rd8 Kg1 6 Re8 etc. Supplied to me by Ralf Binnewirtz.

(1948) Niemann, J. *Schachmatt*, 7.iii.1948. White Pd5/a2/h2 (3), Black Pb7/d6 (2), White to play and win. 1 h4 (1 h3 b5 and Black will promote while wP is still on h6) b6 (if 1...b5 then 2 a4 straight away) 2 a3!

(this time White must temporise) b5 3 a4 bxa4 and we have Törngren 1929: 4-6 h7 a1R 7 h8B. White must promote at just the right moment, not before Black and not more than one move after him. Supplied to me by Ralf Binnewirtz.

- (1948) Niemann, J. *Schachmatt*, 23.v.1948. White Rc4, Nb4 (2), Black Bg5 (1), White to play and win (a) as set, (b) with WNb4 on b2. (a) 1 Rc1 Bxc1 2 Na2; (b) 1 Rh4 Bxh4 2 Nc4. Taken from *John Niemann / Eine Gedenkschrift* (Büsing and Gruber, 1996).
- (1948) Schlensker, P. and Kniest, A. H. *Schachmatt*, 24.x.1948. White Pb4 (1), Black Bc8/g5, Nb8/g8, Pd7/e6 (6), can White to play win? No, after 1 b5 Bf4 2 b6 Bc7 3 bxc7 Bb7 4 cxb8B Black can draw by moving bNg8 to a dark square and then tempoing with bBb7, and other promotions lose (the source says that cxb8K also draws but in fact Black has a simple win). Supplied to me by Ralf Binnewirtz.
- (1948) Schmidt, P. and Kniest, A. H. Source unknown to me, 18.xii.1948. White Kg8 (1), Black Bg5, Nb8, Pc5/e5 (4), can Black to play win? No, 1...c4 2 Kg7 Bf6 3 Kxf6 c3 4 Kxe5 c2 5 Kd4 c1K 6 Kc3 and it is White who wins. The computer thinks that 1...Bd8 holds out longer, but White wins in all lines. Supplied to me by Ralf Binnewirtz.
- 1949 “Kluever” (presumably Klüver), H. *Fairy Chess Review*, x.1949. White Kh2, Nh6, Pe2 (3), Black Kd4, Ne5 (2), White to play and win. 1 e4 Kxe4 2 Nf5 Kxf5 3 Kh3; not 1 Ng4 Nxg4 2 e3 (2 e4 Kxe4 and Black draws at least) Nxh2 3 exd4 Nf3 4-6 d7 Ne5 7 d8B Nd3.
- 1951 Boyer, J. (Joseph). *Les jeux d'échecs non orthodoxes*, chapter “Les échecs battu-battant” (pp 49-52). A survey including three studies (Roese 1923, Fabel and Klüver 1947, Slater 1935) and listing several references.
- 1951 Kahl, P. *Feenschach*, ix.1951. Two studies.
- White Pa3/c2/e2/g2 (4), Black Pa7/c7/e7/g7 (4), who wins? Black. If this position is from a game, it must be his move (the only possible last move was b2xa3 by White), and he wins by copying White's moves with every pawn except the last and then deliberately playing differently. For example, 1...a6 2 a4 a5 3 c3 c6 4 c4 c5 5 e4 e5 6 g3/g4 g5/g6! 7 g4/g5.
 - White Ka8, Ng3, Pf2 (3), Black Rc6, Bd5, Pg4 (3), White to play and win. 1 Nh1! (not 1 Ne4 Bxe4 2 f3/f4 gxf3 3 Kb7, when it is Black who will win) Bxh1 2 f4 gxf3 3 Kb7 Ra6/Rc8 4 KxR Bg2 5 Kb7 Bh1 6 Kc6 Bg2 7 Kd5 Bh1 8 Ke4 Bg2 9 Kxf3.
- (“It's really Black's move” is a problemists' trick, and where the stipulation states or implies that it is White to play we shall normally content ourselves with examining the play forward from the diagram and shall not concern ourselves with whether the position can legally be reached in a game. However, in the first position here the stipulation is explicitly “Who wins?” and nothing is said or implied about whose move it is, so there is no real element of trickery, and the play is of genuine interest.)
- 1952 Hofmann, H. *Feenschach*, vi-vii.1952. White Kh6 (1), Black Pa5/g4 (2), White to play and win. 1 Kg6 a4 2 Kf6 (2 Kf5? a3 and 3-4...a1R wins) a3 3 Ke5 g3 4 Kd4 and wK will sacrifice himself to one bP or the other (but not 4 Ke4 g2 5 Kd3 g1R 6 Kd2 Re1 7 Kxe1 a2 and 8...a1K with a draw). Nor does running the g-pawn help: 2...g3 3 Ke5 (but not 3 Kf5 g2 4 Kf4 a3 5 Ke3 g1R and White must again settle for 6 Kd2 Re1 with a draw, or 4 Ke4? g1R followed by 5...Rb1 and Black will win) g2 4 Kd4 and wK will give himself to the a-pawn, or 1...g3 2 Kf5 g2 3 Kf4 (preventing 3...g1R) g1K 4 Ke4 a4 5 Kd3. The source gives additional analysis. It is a very instructive ending, both for the way White wins and for the way Black draws or even wins himself should White go wrong.
- 1955 Boyer, J. (Joseph). *Le Courier des Echecs* (“Revue bi-mestrielle d'Echecs par Correspondance”) 53, ii.1955, article “Les échecs battu-battant” (pp 1-3). A general article including two studies (Klüver 1934 (2P v 2P), Fabel 1934) and “une excellente partie récente de nos tournois” played between E. T. O. Slater and H. Klüver which came down to an ending with White Pd7/a6 (2), Black Qg6, Pa7/e6 (3), White to play his 27th move. Play continued 27 d8K! (other promotions allow Black to sacrifice bQ and bPe6, winning by stalemate) Qb1! 28 Kc7 Qb8 29 Kxb8 e5 30 Kxa7 e4 31 Kb7 e3 32 a7 e2 33 a8R e1K! with a draw (all other promotions lose). Boyer's exclamation marks throughout. This game was to attract further attention, as the next few entries demonstrate.
- 1955 Boyer, J. (Joseph). *Engelhardt's Schach-Taschen-Jahrbuch* 1956, section “Schlagschach” (pp 40-43) within a chapter “Dreimal anders als sonst”. An article including an exposition of the Slater-Klüver correspondence game mentioned above. The 4 v 4 pawn ending after Black's 17th move is highlighted (White Pa3/e3/f2/g2 v Black Pa7/d7/e7/g6): 18 e4 g5 (18...d5 is shown to lose) 19 e5 (19 f4 gxf4 20 g3 fxf3 21 e5 transposes) e6 20 f4 gxf4 21 g3 fxf3 22 a4 g2 23 a5 g1Q 24 a6 d6 25 exd6 Qb1 26 d7 Qg6! and we have the position already seen. However, after 27 d8K Qb1 the move 28 Ke8 is suggested as an alternative to the actual Kc7, and a prize is offered for the best analysis. The game is referred to as having been played in July-November “1955”, but if the dating of *Le Courier des Echecs* is to be relied

on this must be a misprint for 1954. The prize offer was repeated in the xii.1955 issue of *Fairy Chess Review* (p 54), but with wording implying that the position with wKe8 was actually reached in the game.

- 1955 Fabel, K. *Rund um das Schachbrett*, 1955, chapter “Wer verliert, gewinnt!” (pp 49-55). This is broadly similar to the chapter in *Am Rande des Schachbretts* (1947), but some of the examples are different and account has been taken of the 1948 Hansson article in *Fairy Chess Review*.
- 1956 Hofmann, H. *Feenschach*, vi.1956. White Kh3 (1), Black Rf8, Pb7 (2), White to play and draw. A brilliant and most instructive ending, which apparently found no successful solver. 1 Kg3/2? Rc8! 2 Kf1/2/3/4 b5 3 Ke1/2/3/4/5 b4 4 Ke1/2/3/4 (4 Kd6 Rh8 5 Kd5 b3 6 Kd4 b2 7 Kc4 Rh7) b3 5 Ke-/f- (5 Kd5 Rh8 etc) b2 6 Ke2!? Rc7! and promotion to R or B next move. 1 Kg4! Rc8 (1...Ra8? 2 Kf3 b5 3 Ke2 Rc8 4 Kd1 Rh8 5 Kd2 and White wins) 2 Kf5 b5 3 Ke6 (threatening 4 Kd7 with a draw) Rc3 (3...Rc2/Rc1 see below) 4 Kd7!! Rh3 (4...Rf3 5 Ke6 Rf7 is only a draw) 5 Kd6 (now bR has been driven from the c-file, wK can go for bP) b4 6 Kd5 b3 7 Ke4 Rh1 8 Kd3 b2 9 Kd2 Re1 10 Kxe1. 3...Rc2 4 Kd7 Rh2 5 Kd6 b4 6 Kd5 b3 7 Kd4 b2 8 Ke3 Re2/Rf2 9 KxR draw (8...Rh8? 9 Kd2 wins); 3...Rc1 4 Kd7 Rh1 5-7 Kd4 b2 8 Kd3 Rf1 (8...b1R? 9 Kd2 wins) 9 Kd2 (not 9 Ke2 b1N 10 Kxf1 Nd2). The source gives further detail in minor lines. This and Hofmann 1952 should be studied by everyone who wishes to master Losing Chess, because endings like this frequently arise in practice.
- 1956 Hofmann, H. *Die Schwalbe* vi.1956. White Rh8, Ph2 (2), Black Rc1, Pb5 (2), White to play and win. 1 h4 b4 (1...Rc8 2 Rxc8 and 3-5 h7 will win) 2 h5 b3 3 h6 b2 (3...Rb1 4 h7 Rb2 5 Rc8! and either 5...Rc2 6 Rxc2 bxc2 7 h8R or 5...Rb1 6 Rc1 Rxc1 7 h8R) 4 h7 Rb1 (now bR must hide) 5 Ra8! Ra1 6 Rxa1 bxa1R 7 h8B.
- 1957 Klüver, H. *Engelhardts Schach-Taschen-Jahrbuch* 1958, article “Eine Schlagschachstudie” (pp 35-38). An analysis of the competition position set two years previously: White Ke8, Pa6 (2), Black Qb1, Pa7/e6 (3), Black to play his 28th move.

The analysis starts with three preliminary remarks.

- The offer of bQ at b7 loses, as wP promotes to R at b8 and is then offered to the a-pawn, while wK is offered to the e-pawn. Example: 28...Qb7 29 axb7 a5 30 Kd8 a4 31 Kc7 a3 32 Kc6 e5 33 Kc5 e4 34-35 Kc3 e2 36 Kc2.
- White’s threat to offer wK to the e-pawn from the right can only be countered by compelling wK to capture bQ on a square 3 squares diagonally back from the pawn, for example 28...Qh1 29 Kf8 e5 30 Kg7? Qh8! 31 Kxh8 e4 32 Kg7 e3. Now Black threatens to promote to B with a draw, and if wK plays to g5 then Black will promote to R with a win. However, Black cannot force this, but at best a position in which wK is one move nearer to bP. Now Black’s eventual Pe2 can be met by playing wK to f4, and in this position even promotion to K will lose.
- The attempt to post bQ at e1 and bring bPe6 to e2 can be met by Ke4, putting Black in zugzwang.

There follows an exposition of the further course of the game (“der weitere Partieverlauf”): 28...Qh1 29 Kf8 e5 (now 30 Kg7? is met by 30...Qh8! as in the second bullet above) 30 Kf7! (but by reaching a position with Kf7/Pe5 from the original Ke8/Pe6, White has effectively gained a tempo) e4 (30...Qb7 still loses) 31 Kf6 e3 (the threat of Kg5 and Kg4 gives Black no other option, for if say 31...Q-- 32 Kg5 Qh6 33 Kxh6 e3 then White is one tempo ahead of the line in the second bullet and Black cannot hold the draw) 32 Ke5 (now an offer of the queen is hopeless, and if bQ removes herself to a square from which she cannot capture wK then he enters the field of the e-pawn from the left; Black chooses the third and most interesting way to die) Qb7 (this takes us into the first bullet) 33 axb7 a5 34 b8R a4 35 Kd4! (the quickest and most elegant, with 35...e2 36 Kd3 a3 37 Kxe2 a2 38 Kd2 a1K 39 Rb1 Kxb1 40 Kc1 or 35...a3 36 Kxe2 a2 37 Kd2 and the same). So Black resigned (“Schwarz gab daher auf”).

All this is incompatible with the game as reported in *Le Courier des Echecs* (see above), but it would seem that 28 Kc7 was the move actually played in the tournament and that the players then wondered what would have happened after 28 Ke8 and went back and replayed. The analysis was reproduced in translation in *Fairy Chess Review* (see below), and I have relied heavily on that translation here.

- 1958 Slater, E. T. O. *Fairy Chess Review*, iv.1958, p 175. A translation of the analysis above.
- 1960 Mortensen, J. *Feenschach*, ii-iii.1960. White Pa7 (1), Black Nb4/c4 (2), White to play and win. 1 a8K? Nb6 2 K-- Na8 3 Nxa8 Nd5! and the knight dominates the king; 1 a8N? Nb6 etc; 1 a8B! and even though Black can sacrifice one knight, White can sacrifice himself to the other.
- (1967) Dornieden, M. *Deutsche Schachzeitung*, xii.1967, pp 406-7. An article “Silvesterschach” including one Losing Chess ending: White Nb5, Ph4 (2), Black Pd6/a3 (2), White to play and win. 1 Nxa3 (1 Nxd6 loses) d5 2-4 h7 d2 and now given is 5 h8Q which is indeed quickest, but 5 Nc2 is almost as simple and 5 h8R also wins. Supplied to me by Ralf Binnewirtz.

- 1973 Hoffmann, F. *feenschach*, vii.1973. White Ke5, Rh1, Bf1, Ng3, Pc4/g2/h2 (7), Black Bc8 (1), White to play and win. 1 Ke6 Bxe6 2 Ne2! Bxc4 3 Ng1 etc.
- 1975 Panteleit, U. *feenschach*, iv.1975. Two studies.
- White Na3 (1), Black Nf1, Pf2 (2), Black to play and White to draw. This appears to have been the first study to explore the complexities of BN v N. To win, Black must play his knight to a square of the same colour as the bishop and then sacrifice the bishop; the resulting N v N ending is won. White's counter-plan is to provoke the bishop while the Black knight is still on the wrong colour, since a sacrifice of the bishop in these circumstances gives the N v N win to White. 1...Nh2 (other moves lose, for example 1...Ng3 2 Nc2 f1B 3 Ne1 Bg2/Bd3 4 NxB and wins with N v N) 2 Nc2 f1B 3 Na3! (3 Nb4 Bh3 4 Nc2 Bc8 5 Nb4 Bg4 6 Nc2 Bh5 7 Nd4 Ng4! 8 Ne2 Bg6 9 Ng1 Bf5 10 Ne2 Bd3 etc) and either 3...Bg2 4 Nc4! Bh1 5 Nb6 Nf3 6 Nd5 Bg2 7 Nb6/Nc7 Bh1 8 Nd5 etc or 3...Bh3 4 Nc4! Bc8 5 Na5 Bf5 6 Nc4 Be4 7 Na5 and bN will never be able to reach a good square. The solution as originally published was garbled, but a corrected solution was published in 1977.
 - White Pd2 (1), Black Nh1 (1), White to play and win. This is given as insoluble (1 d4 Ng3 2-4 d7 Ne8 or 1 d3 Ng3 2-3 d5 Nd6 and "die Stellung remis ist" (stalemate presumably counting as a draw), but in fact Black has a win. This also was corrected in 1977.
- 1977 Panteleit, U. *feenschach*, iv-vi.1977. Corrections of the two items above. In the case of the first study the correction merely involved giving a correct solution, but the second study was reset as wNa8 v bPe7 with stipulation "Black to play, White to win" and solution 1...e5 2-5 Nd1, 1...e6 2-5 Nd4/Nf4 and either 5...e1B 6 Ne6 or 5...e1- 6 Ne2. Also included was the non-stalemate solution to Dawson 1938.
- 1978 Carfora, A. *Eteroscatto* 2, vii-ix.1978. White Nd4, Pa2 (2), Black Nb2, Pb3/a4 (3), White to win in 4 moves. 1 axb3 axb3 2 Nxb3 Nd1 (best) 3 Nd2 and a sacrifice next move.
- 1978 Magari, R. *Eteroscatto* 1, iv-vi.1978 (pp 11-12), 2, vii-ix.1978 (pp 20-22), 3, x-xii.1978 (pp not known by me). The first part of this article discusses the general theory of "colour-change pieces" (the squares on the board are denoted by various colours and we consider pieces which change colour systematically with each move) and has no particular relevance to Losing Chess. The remainder considers Losing Chess using three different types of man: (a) the ordinary knight; (b) the ordinary draughtsman, which moves one square diagonally but captures by jumping over an adjacent man on to an empty square immediately beyond, chain jumps being permitted; (c) an "elementary two-colour piece" which can move only one step horizontally or vertically. In endings with pieces of a single kind:
- the one-against-one case is won by whoever is to move when the pieces are on squares of the same colour;
 - in general, two draughtsmen win against one (because the possibility of a chain jump permits the side with two men to offer a sacrifice which would normally lead to a lost one-against-one ending) but other two-against-one endings are drawn;
 - it is conjectured that the ending of two elementary two-colour pieces against two is in general drawn;
 - in general, n draughtsmen win against one (the side with more men gets rid of his men one by one, playing a tempo move with another man if necessary, and eventually comes down to the win with two against one);
 - in general, three elementary two-colour pieces against one is only a draw;
 - it is conjectured that the ending of three knights against one on the ordinary board is also drawn, though some doubt remains on account of the relatively small size of the board;
 - it is conjectured that the ending of h elementary two-colour pieces against k is in general drawn unless $h = k = 1$.
- The author gives an instructive illustration of three elementary two-colour pieces against one on a 3x8 board: White on a2, a1, b1, Black on c3, Black to play. The natural line might seem to be 1...c3-c4 2 a2-a3 c4-c5 3 b1-b2 c5-b5 4 a1-a2 b5-c5 5 b2-b3 c5-c6 6 a3-a4 c6-b6 7 a2-a3 b6-c6 8 b3-b4 c6-c7, where White is clearly winning, but if Black concedes ground voluntarily instead of waiting until he is forced he can keep White at bay: 3...c5-c6! 4 b2-b3 c6-b6 5 a1-a2 b6-a6 6 a2-b2 a6-b6 7 b2-c2 b6-c6 8 c2-c3 c6-b6 9 b3-b2 b6-b5 10 b2-a2 b5-b6.
- My interpretation of this item in the provisional versions of this document was badly wide of the mark, and I am grateful to Chris Feather for providing me with a proper translation.
- 1978 Salvadori, R. *Eteroscatto* 2, vii-ix.1978. An article "La promotion" (pp 11-12) dealing with a simple one-against-six study (White Pc7, Black Kf7, Rg8, Nf8/e5, Ph7/g5) where a promotion to king is

necessary in order to win.

1979 Gik, E. 64, 1979, issues 2 and 26 (11.ii-17.ii and 28.vi-4.vii). Two articles. The first, which I know only through a translation into Italian by Marco Bonavoglia in *Eteroscacco* 7 (x-xii.1979), quotes two studies described earlier (Törmgren 1929, Fabel and Klüver 1947). The second, which is in the BCPS Library, contains the refutations of 1 d4, 1 e4, and 1 d3 given in the *Encyclopedia of chess variants* (Pritchard, 1994), two problems by Dawson described above, and a twelve-against-one Russian draughts problem (White has a game array, Black a single man at h8).

1979 Magari, R. *Eteroscacco* 5, iv-vi.1979. An article “Il finale de C/P” (p 12) which deals with various cases of the ending N v P. The case Nh8 v Pd7 (Black to play) is given as lost, Nh8 v Pb7 as drawn by stalemate (1...b6 etc), and Nh8 v Pa7 as won (Black plays 1...a5 and White arrives too late). Also considered is Nb8 v Pd7, given as won for Black because the knight cannot get back to e1 or c1, Nd8 v Pd7 with the same result (the text actually says “Lo stesso si verifica col P nero in d7 e il C B in c8” but “c8” appears to be a misprint), and Nf8 v Pd7, where Black wins because the knight can get back to g2. The win against a Black c-pawn, meeting ...c1B by Na2, is overlooked.

(Knight against pawn is the most complicated of the one-against-one endings, and several published statements have been incorrect or incomplete. Suppose for the moment that being stalemated wins, and that the pawn has just moved. If the knight is now on the square of the *opposite* colour, it can hope to win by sacrificing itself to the pawn before the latter promotes; if it is unable to do this, the pawn wins by promoting to knight. If the knight is on a square of the *same* colour, there can be no sacrifice to an unpromoted pawn, and a rook's or knight's pawn can always win by promoting to bishop; but a knight may be able to defeat a bishop's or centre pawn by forcing a promotion to bishop and then taking up one of the exceptional winning positions (Na2 v Bc1, Nd6 v Bd1). If stalemate is a draw, the “opposite colour” case is unchanged, but the knight may be able to draw a lost “same colour” ending by giving stalemate. Everything else can be deduced from this.)

(1979) Minieri, -. *Telescacco*, 1979. White Be4, Nd8/e1 (3), Black Pd7/e7 (2), White to play and win. Quoted by Leoncini and Magari in *Manuale di scacchi eterodossi* (see below) with solution 1 Nc6 dxc6 2 Bxc6 and now either 2...e6 3 Bd5 exd5 4 Ng2 or 2...e5 3 Ba4! e4 4 Nd3 exd3 5 Bc2, but there are alternatives just as quick.

1979 Salvadori, R. *Eteroscacco* 4, i-iii.1979. An elementary article “Chi muove per primo” (pp 10-11) discussing the endings P v P where both pawns are on the seventh rank.

1980 Kuhlmann, J. *Die Schwalbe*, xii.1980. White Pa7/g5 (2), Black Kd8, Ph4 (2), White to play, shortest win? This is one of the most complex pre-computer studies. Black threatens 1-3...h1R drawing at least, 1 a8B h3 2 Bg2 hxg2 is again only a draw, and 1 a8Q loses to 1...Kc8. So 1 g6 h3 2 g7 h2 3 g8B! (3 g8K also prevents 3...h1R, White having 4 Kh7 and as below, but it offers no hope of winning). Now 3...h1R is met by 4 Bh7 Rxh7 5 a8N! Ke7 6 Nb6 Kf7 7 Nc8 Kg7 8 Nd6, a lovely line, while 3...h1K loses to 4 a8R, and 3...h1N allows 4 a8N followed in due course by a win with BN v N. What about bK? If it moves off the eighth rank White can win by an immediate 4 a8R, and if 3...Ke8 then 4 Bf7 Kxf7 5 a8R. Hence 3...Kc8, and now 4 Ba2! is quickest (4 Bh7 Kd8 5 Bb1 Kc8 6 Ba2 is slower, and nothing else wins). Black's rook promotion is again prevented (4...h1R 5 Bb1 Rxb1 6 a8K!), so he has nothing better than 4...Kd8, and now comes the coup de grace: 5 a8Q!! This finally kills Black's hope of a rook promotion (5...h1 6 Qxh1 and White will win) and leads to a win in all variations, one of the lines holding out longest being 5...Kc8 6 Qxc8 h1K 7 Bc4 Kh2 8 Qf8 Kh3 9 Bd3 Kh2 10 Be2 Kh1 11 Qf5. A full analysis appeared in *Die Schwalbe* in 1999 (see Gruber 1999). The ending BN v N had already been explored (Panteleit 1975), but this appears to have been the first study to examine QB v K and to show the delightful winning line in the normally lost ending N v KR.

1980 Leoncini, M. and Magari, R. *Manuale di scacchi eterodossi*. There are two elementary P v P endgames with the pawns on the seventh rank on page 88 (also a problem with seven men against two) and two complete chapters on the endgame: “I finali” (pp 127-33) and “Considerazioni conclusive” (pp 134-5). “I finali” contains the following.

- An introductory problem (six men against one) in which White has to cope with every Black promotion.
- An extensive treatment of one-against-one endings. It is largely complete, but the exceptional wins with Na2 v Bc1 and Na2 v Kc1 are overlooked (only the “domination” wins with Nd6 v Bd1 and Nd4 v Ka1 are given), as is the similar win with Na1 v Rc2. King against pawn and bishop against pawn are illustrated by diagrams showing winning, drawing and losing squares against a Black pawn on d2 (the pawn to move); there are misprints in the diagrams, but they are so obvious that no perceptive reader is likely to be misled. More seriously adrift is the treatment of knight against pawn, which copies that of Magari 1979; the win by playing Na2 against a promoted Bc1 is

overlooked here as well, and the misprint “Lo stesso si verifica col pedone nero in d7 e il Cavallo bianco in c8” is also repeated here. Pawn against pawn, the pawns not being blocked and not being on adjacent files, is given as a win for the player to promote first (by promoting to a rook), with two exceptions: (a) when the pawns are on the a and h files and the same distance from promotion, in which case the player wins who promotes second wins, and (b) when the pawns are on the same file having passed each other, in which case a small advantage is insufficient to win. For example, a White Pa7 with the move loses against a Black Ph2, draws against Pa2 or Pa3, and wins against any other pawn.

(This is perhaps a convenient point at which to summarize one-against-one endings. Excluding as “trivial” positions where the side to move must make an immediate capture or can win by making an immediate sacrifice, the general results for piece against piece are as follows: Q/R/B against Q/R/B is trivial; Q or R wins against N or K; B or K wins against N, draws against K; N against N is a win for whoever is to move when the knights are on squares of the same colour. All this was known to Klüver, who noted some positions where the normal rule did not apply (see Klüver 1924). Definitive analysis by computer has listed the exceptional positions as follows: (a) a set of “attack and wait” wins typified by Qb8 v Bb1, Rb8 v Bb1, Bh8 v Ra1, Na1 v Rc2, Na2 v Bc1, and Na2 v Kc1, where the piece attacked is unable to sacrifice itself and the attacker then sacrifices on the square its opponent has just vacated; (b) two “domination” wins for a knight, Nd6 v Bd1 and Nd4 v Ka1; (c) three similar “domination” wins for a bishop against a king, Ba4 v Ka1, Bc4 v Kc1, and Bd4 v Kd1, though not Bb4 v Kb1 where the king can hold the draw by moving to a1. Every pre-computer writer who attempted to give a complete exposition, myself included, appears to have overlooked at least one of these exceptions. Knowledge of the piece-against-piece results enables the results for pawn-against piece and pawn-against-pawn to be worked out, and Leoncini and Magari are correct apart from the case N v P and the obvious diagram misprints.)

- Other knight endings. Reference is made to the 1978 articles “I pezzi a più colori e i finali di soli Cavalli a vinciperdi” by Magari in issues 1-3 of *Eteroscacco* (see above), and a summary appears to say that 2N v N and 2N v 2N are generally drawn and that the same is probably true of other endings such as 3N v N.
- RB v K, RRB v K etc. These are given as wins, the rooks sacrificing themselves in succession. An example is given: White Ra1, Be1 (2), Black Ke5 (1), White wins by 1 Ra3 Kd5 2 Bd2 Kd6 3 Ra4 Ke6 4 Rg4 Kd6 5 Rf4 Kd7 6 Bc3 Kc6 7 Re4 Kc7 8 Re5 Kb7 9 Bb5 Kb8 10 Re6 Kc8 11 Bc5.
- King against pawns. If he is near to the pawns, the king obviously wins. If he is distant, he may lose; each pawn bar the last promotes to rook, and if the last cannot promote safely to a rook, because the king is on the same or a neighbouring file, it promotes to a bishop. There is a reference to a game Salvadori-Magari which I haven't seen.
- KR v K. Drawn in general, but an exception is given: White Kd5, Rf6 (2), Black Kd8 (1), White wins by 1 Rf4 Kc8 2 Re4 Kb8 3 Kc5 Kc8 4 Re3 Kb8 5 Rd3 Ka8 6 Kb5 Kb8 7 Rd4 Ka8 8 Rc4. However, if everything starts down a rank and White plays 1 Rf3, Black can play 1...Ke8 and regain the seventh rank later.
- 2B v K. Won in general by bringing the bishops together and then gradually restricting the king. An example is given: White Bg1/h1 (2), Black Kh4 (1), White wins by 1 Bc6 Kg5 2 Bc5 Kg6 3 Bd6 Kh5 4 Bd5 Kh6 5 Be6. But if the bishops are separated, the king may be able to draw; for example, (a) Ba8/h6, where the king can draw by attacking any square on the diagonal h1-a8 apart from f3 and e4, and (b) Ba7/h7, where the king can draw by occupying any square on the diagonals h1-a8 and h2-b8 which is not adjacent to e4 or d3.

“Considerazioni conclusive” includes four studies already noted above: Fabel and Klüver 1947, Slater 1935, Roese 1923, and Minieri 1979.

(1983) Büsing, G. *Jugendschach*, 1983. White Be3, Pe6/h2 (3), Black Ne2, Ph3 (2), White to play and draw. 1 Bg1 (1 Bc1/Bf4 Nx2 e7 Nd3 3 e8B Nf2 4 Bf7 Nh1 and 5...Ng3 followed by 6-7...h1R will win, 1 Bd4 Nxd4 2 e7 Nf5 3 e8B Ne3) Nxd4 2 e7 Ne2 3 e8Q! (other promotions lose) Ng3 4 hxg3 h2 5 Qe3 (other moves again lose) h1K 6 Qg1 and 7-11 g8K. Supplied to me by Ralf Binnewirtz. This appears to be the earliest published position in which P=Q is necessary to force a draw, and it remains the most economical setting of the task.

1983 Büsing, G. *Die Schwalbe*, iv.1983. Two studies.

- White Pf7/g3 (2), Black Ke2 (1), White to play and win. Given is 1 g4 Ke3 2 g5 Ke4 3 g6 Ke5 4 g7 Kf5 and now 5 f8B is the only move to win, but *Giveaway Wizard* thinks that 4...Kd6 would have given Black a draw (for example, 5 f8R Ke5 6 Rc8 Ke6 and if 7 g8R? then 7...Ke7).

- White Pf7/a6 (2), Black Rc7, Pa7/d3 (3), White to play and win. The published solution gives merely “1 f8N!!” with a reference to a page of typescript, but *Giveaway Wizard* gives as best play 1...Rc8 2 Ne6 Rf8 3 Nxf8 d2 4 Ne6 d1B 5 Nc7 and we are in the 1 Bc1 line of the *Jugendschach* study. If 1...Rb7 then 2 axb7 d2 3 b8R d1K 4 Ne6 a5 5 Nd4 Kc2/Ke2 6 NxK a4 7 Nd4 a3 8 Rb7 a2 9 Rb6 and wins against all promotions.
- 1985 Bonavoglia, M. *Eteroscacco problemi* 1, vi.1985. An article “Problemi di Vinciperdi” (pp 20-21) which quotes some known work (Dawson 1924, 2 x Dawson 1925, Törngren 1929, Fabel and Klüver 1947) and announces the tourney described below.
- 1987 Dittmann, W. *Eteroscacco* 38, iv-vi.1987. White Rh8/d4, Bb1, Ph7/f6/h6/a3/c2/g2 (9), Black Ba1, Pg6/g5/c3/b2 (5), White to play and win in ten moves. 1 Rd6, 2 Rf8, 3 h8R, 4 h7, 5 Bb1, 6 Bxb1, 7-8 Bg8, 9 f7 and 9...Bxf8 gives stalemate. This would normally be regarded as “in nine moves”, but in *Eteroscacco* the final move which White was unable to play was also counted. Issue 23 of *Variant Chess* (summer 1997) reported a second and longer solution which would be valid if the solution merely stipulated “White to play and win”, but the problem as published specifically stipulates “in 10 mosse”. This was the prizewinner in the composing tourney mentioned above; there were ten compositions in the tourney report, but only four were sufficiently orthodox to be listed here.
- 1987 Hertz, Z. *Eteroscacco* 38, iv-vi.1987. An unhonoured study from the same tourney: White Rh4, Nd2, Pa2 (3), Black Re1, Nd1, Pf2 (3), White to play and win. 1 Nf1 Rxf1 2 Ra4, and wins in all lines. Given in reply to 2...Nb2/Nc3 is 3 a3 winning by stalemate, but Fabrice Liardet points out that White has alternative continuations in which he can sacrifice both men.
- 1987 Sekhar, R. and Shankar, R. *Eteroscacco* 38, iv-vi.1987. Two further studies from the tourney, the first commended, the second unhonoured.
 - White Ra1 (1), Black Be6, Nf6 (2), Black to play and draw. White threatens 2 Ra2 and 1...Ba2 leads to a lost N v R ending, hence 1...Nd5. White’s only safe move is 2 Ra2 (everything else allows two sacrifices), and now Black must play 2...Bg8! (not 2...Bf7, when 3 Rh2 Bh5 4 Rxb5 wins for White, nor 2...Nf6, when 3 Rd2 is simplest though 3 Rb2 and 3 Rg2 also win, nor 2...Ne7 3 Ra5). White must go back, 3 Ra1, and Black still cannot play 3...Bf7 (4 Rh1 etc) and must play 3...Be6; draw by repetition. This beautiful trifle has only a short solution, but it is in quite a different class from most Losing Chess studies.
 - White Kd4, Ba1 (2), Black Rf6, Bh8 (2), White to play and win “in six moves” (see above). Given is 1 Bb2! (1 Bc3 Bg7 2 Bb4? Bf8! or 2 Ba5 Rb6 and Black wins) Bg7 2 Bc3 (2 Ba3 Bf8 and Black wins) Bh8 3 Bb4 (or 3 Bd2 etc) Rd6 4 Bxd6 Bxd4 5 Be5, but 1 Bc3 Bg7 2 Bb2 Bh8 3 Ba3 works just as well.
- 1989 Beasley, J. D. International problemists’ meeting, Bournemouth, 1989. White Kh5, Pf7 (2), Black Kh7 (1), White to play and win (a) in ordinary chess, (b) in Losing Chess. Play (a) 1 f8R, as is well known; (b) 1 Kh6 Kxb2 2 f8R again. This was composed for a light-hearted tourney for twin studies (orthodox chess being implicitly assumed) in which it was announced that more attention would be paid to novelty of twinning mechanism than to depth of play. I submitted it as a joke entry, and the judge gave it the prize for sheer cheek.
- 1991 Liardet, F. *Schweizer Schach-Magazin*, viii-ix.1991. Article “Le ‘Qui perd gagne’ ” (pp 282-5). A general article paying particular attention to the ending, and including a table showing the general result for most two-man and three-man endings without pawns. He identifies 2N v Q, KN v Q, and QN v K as endings which appear not to permit the formulation of a general rule, and examines the endings that follow in greater detail.
 - N v N and K v N.
 - BN v N: “White must place his knight on a square of the same colour as his bishop, after which he can come down to a winning N v N ending.” Example: White Bb4/Nc4, Black Ne6, 1 Be1 (1 Bc5 gives a lost N v N ending) Nc5 2 Ne3 (not only does this put the knight on a square of the right colour, it enables the bishop to escape from the forthcoming domination) Ne6 3 Bf2 (hiding behind the knight) Nc5 4 Bg3 Nb3 5 Bh2 Nc5 (5...Nc1 6 Be5) 6 Bd6 N-- 7 Bc5 Bxc5 8 Nc4 and wins.
 - KN v B: “White wins if the knight can plant itself on a square of opposite colour to the bishop, and within the region d2-e2-g4-g5-e7-d7-b5-b4-d2.” Example: White Ke1/Nd2, Black Bc8, play 1 Kd1 (1 Ke2 Bh3 and wins, 1 Kf2 Bd7 2 Kf1 Ba4 draw) Bd7 (bB is restricted to the squares c8/d7/e8) 2 Kc2 Bc8/Be8 3 Kd3 (if say 3 Kb2 then 3...Bg4/Bh5) Bd7 4 Kd4 and either 4...Bc8 5 Kc5 or 4...Be8 5 Ke5. I have reconstructed a slightly garbled text.
 - 2B v K: “The bishops must stay grouped.” Example: White Bd1/d8, Black Kd4, play 1 Bh5 Ke4 (1...Kd5 2 Bh4) 2 Be8 Kd4 3 Bd7 Kd3 4 Be7 Ke3 5 Be6 etc. Computer analysis has shown that the

defence can do better, though the bishops still win (4...Kd2/Ke2! 5 Be6 Ke3 and now it is White's turn to retreat, but he plays 6 Bf7 and is still making progress).

- RB v K: "This isn't quite so easy, since it is necessary to stop bK from capturing wR on its own." This ending had already been examined by Klüver in 1934, and the exceptional case cited here (White Rc3/Ba1, Black Ke5) is wrongly analysed. It is correctly given as drawn with Black to play (1...Kf5 2 Bb2 Ke5 3 Ba1 etc), but the statement that White to play wins by 1 Bb2 is incorrect; Black holds the draw by 1...Kf6.
- R v 2N: "The general rule is that one of the knights must attain the region d3-e3-f4-f5-e6-d6-c5-c4-d3 to hold the draw." Example: White Re1, Black Nb7/b4, play 1 Rf1 Nc5 2 Rf8 Nc2 and the knights have already gained a column, or 2 Rg1 Nd5 3 Rh1 Na6 (my conjectural reconstruction of "3 Ra1 Nd6") "and there is no longer any question of pushing Black back". However, Black to move loses: 1...Na5 (1...Na6 2 Re3 Nb8 3 Re4) 2 Re8 Nb3 3 Re7 Na1 (3...Na2 4 Re6) 4 Re5! Na2 5 Rd5.

My translations throughout. This appears to have been the first attempt to analyse three-piece endings by identifying "winning" and "drawing" regions, and it remains of interest even though computer analysis has shown that the simple rules given here are not entirely valid.

- 1992 Evseev, G. International problemists' meeting, Bonn, 1992. White Nb1 (1), Black Nh8/a6 (2), White to play and win. This was subsequently reproduced in several magazines (for example, in the *British Chess Magazine* in xi.1992), and I think it best to quote the solution as given in the article by Evseev and Poisson in *Rex Multiplex* in iv.1993. Here the main line is given as 1 Nc3 Nb8 (if 1...Nf7 then 2 Nb5/Ne4 and if 1...Ng6 then 2 Nd5, in each case threatening to sacrifice to both Black knights and winning at once, because if Black sacrifices he loses the N v N ending and if he doesn't sacrifice White will) 2 Nd1! (the only move to win) Na6 (if 2...Nf7 then 3 Nf2 Nd8 4 Nd3 and the Black knights are dominated) 3 Nb2/Nf2 Nc7 4 Nd3 Nb5 5 Nc5 Na3 6 Ne6 Nc4 7 Nd4 Nb2/Nb6 8 Nc6 Nd1/Na4 9 Nb4 and soon wins (9...Nf7 10 Nd3 or 9...Ng6 10 Nd5). This had been found by computer as the longest win with one knight against two, and was set as a solving challenge; I think I am correct in saying that nobody was successful.
- 1992 Evseev, G. 2nd Prize, *Phénix*, 1992 (published xii.1992). White Nb8 (1), Black Pd5/c3/e3 (3), White to play and win. 1 Nc6 and now (a) 1...d4 2 Nxd4 and either 2...c2 3 Nxc2 e2 4 Nd4 e1B 5 Ne6 (not 4 Ne3 e1B 5 Ng2 Bh4!) or 2...e2 3 Nxe2 c2 4 Nc3 c1B 5 Na2 (not 4 Nd4 c1B 5 Nc6 Bh6!), or (b) 1...c2 2 Nd4 and either (b1) 2...e2 3 Nxc2 (3 Nxe2? d4 4 Nxd4 c1B) and now either 3...d4 4 Nxd4 e1B 5 Ne6 or 3...e1- 4 Nxe1 d4 5-7 Nc4/Ne4 d1B 5 Nd6, or (b2) 2...c1B 3 Ne2 d4 4 Nxc1 and now either 4...d3 5 Nxd3 e2 6 Nf4 (6 Nc5? e1K) e1B 7 Ne6 or 4...e2 5 Nxe2 d3 6 Nc3/Ng3 d2 7 Ne4 d1B 8 Nd6. Only 1...e2 2 Ne5 d4 3 Nc4 is straightforward. This is much the most intensive setting yet made of N v P; the line 1...d4 leads to accurate wins with N v cP and N v eP, and after 1...c2 2 Nc4 each of the subvariations 2...e2 and 2...c1B leads to further wins with N v dP and N v eP.
- 1993 Beasley, J. D. *The Problemist*, i.1993. White Pd2 (1), Black Nd1 (1), White to play and win (a) as set, (b) with WPd2 on b2. (a) 1 d4 and 2-5 d8N; (b) 1 b3 and 2-6 b8B. This adds nothing to Magari 1979, or even to Panteleit 1975, and I imagine that it would not have been accepted for publication had a survey equivalent to the present been available at the time.
- 1993 Evseev, G. and Poisson, C. *Rex Multiplex* 41, iv.1993. "Finales de cavaliers en 'qui perd gagne'" (pp 2048-9). An article on endings with one or two knights against one, outlining the general theory and giving the 1992 Evseev study.
- 1993 Richardson, I. *Variant Chess* 10, iv-vi.1993. White Kh8, Rh5, Bh4, Pg7/f6/e5 (6), Black Ba1 (1), White to play and win. 1 Bg5 Bxe5 2 Bh6 Bxf6 3 g8N! and so on, a delightful trifle.
- 1993 Wood, P. C. *Variant Chess* 10, iv-vi.1993. "Vinciperdi" (pp 26-9). An excellent general article, largely based on Boyer 1951, Fabel 1955, Evseev and Poisson 1993, and material from *Eteroscacco*, including three pages on the endgame. It includes an extensive selection of existing studies, though its only original is that by Richardson (see above).
- 1994 Pritchard, D. B. *The encyclopedia of chess variants*, article "Losing chess" (pp 176-9). A general survey of the game, including the correspondence game Slater-Klüver 1954, two existing studies, and one original composition in which a complete White army sacrifices itself to a single pawn. The statements regarding one-against-one endings are not free from error; in the ending P v N where the P is unmoved, it is stated that the P wins by moving to the same-colour square as that on which the knight stands and ultimately promoting to B (this only works with a rook's or knight's pawn), and the ending R v B is inadvertently given as drawn.
- 1994 Wood, P. C. *Variant Chess* 13, i-iii.1994. White Pe6/h3/g2 (3), Black Bb6 (1), White to play and

draw. An instructive study of bishop against pawns. Black would like to manoeuvre his bishop round to g7 or h6, after which he can patrol these two squares, eat the g- and h-pawns as they advance, and sacrifice to White's eventual e7, but if he takes his eye off d8 without threatening a sacrifice White can play e7 and e8B and draw at once. Thus 1 g4 fails: 1...Bc7 2 g5 Be5! 3 g6 Bg7 and Black has achieved his aim, or 2 h4 Bf4! 3 h5 Bh6! 4 g5 Bxg5 5 e7 (the only chance) Bxe7 6 h6 Bg5 7 h7 Bh6 8 h8N Bg7 and sacrifices next move. 1 g3 leads to similar play (1...Be3 2 g4 Bb6 etc). Hence 1 h4 Be3 ("if Black waits, White obtains an easy draw by promoting the h-pawn to a King") 2 h5 Bg5 (2...Bh6? 3 g4 B-- 4 h6 and White wins) 3 e7! Bxe7 4 g4 (an immediate 4 h6 is met by 4...Bf6 5 h7 Bg7 and a sacrifice to White's eventual g5, so White must get his g-pawn to g6 before advancing the h-pawn) Bb4 5 g5 "and Black cannot win: e.g. 5...Bc3 6 g6 Bb4 7 h6 Bf8 8 h7 Bb4 9 h8K".

- 1995 Byway, P. V. *Variant Chess* 18, autumn 1995. White Kc6, Pa7/h2 (3), Black Qe1 (1), White to play and win. The given solution is 1 h4 Qxh4 2 a8N (2 a8B Qe1 3 Bb7 Qh4 4 Ba8 Qe1 with a draw by repetition, a charming line, or 2 Kb6/7 Qf4 3 Kc7 Qxc7 wins) Qe1 3 Nb6 (3 Kc7 Qf2 and 4...Qb6 wins, 3 Kb6 Qg3 similarly, 3 Kb7 Qd2 4 Ka7 Qg5 5 Kb7 Qd2 and at the very least Black can hold the draw by oscillating between g5 and d2) and the queen is dominated. However, 2 a8K also wins: 2...Qe1 (nothing else) 3 Kab7 Qh4 (again nothing else) 4 Kbb6 Qh8 (still nothing else) 5 Kbb5, and again the queen is dominated. The positions with White Kc6, Ba8 or b7, and Black Qe1 (h4 is equivalent) were subsequently found by computer to be the only drawn positions with this material.
- 1996 Beasley, J. D. *British Endgame Study News*, special number 4, xii.1996. "Elementary duels in the Losing Game" (pp 2-3). An attempt to survey one-against-one endings, but omitting the "attack and wait" wins with N v R and the "domination" wins with B or N v K. The treatment of knight against unmoved pawn appears correct.
- 1996 Beasley, J. D. *diagrammes* 119, x-xii.1996. "Les promotions uniques dans les échecs 'à qui perd gagne'" (pp 2917-9). A survey of simple positions in which a specific promotion is needed to win or draw. Winning promotions to R, B, N, and K, and drawing promotions to B and K, are shown in one-against-one positions; otherwise, there is White Pa7, Black Rb6, Pb7/a6, win by a8Q only; White Ba8, Pb7, Black Bb6, draw by b8N only, add Black Pa7, draw by b8R only, further add Black Nd8, draw by b8Q only (a curious triplet which is the article's only real claim to novelty); White Pg7, Black Pd7/f7/g6, draw by 1 g8K (only move not to lose, but now it is Black who is struggling to draw) d5 (only move) 2 Kxf7 d4 3 Kxg6 d3 4 Kf5 d2 5 Ke4 d1K and both sides have had to promote to K (after Watney, *Chess Amateur* 1923, see above). The Watney position is wrongly described as being from 1924.
- (Pa7 v Rb6/Pb7/Pa6 is one of the positions where it is easiest to *prove* that only P=Q wins, since all other moves allow three immediate sacrifices, but while writing this document I noticed that several settings more economical in material were possible: for example, the two-against-one pawn position Pb7 v Pa3/Pb3, where 1 b8R loses to 1...a2 2 Rxb3 a1N and nothing else apart from 1 b8Q offers any hope. This position will have been disclosed by Laurent Bartholdi's 1998 computer analysis, but I do not know whether specific public attention was drawn to it during the period under review. For an earlier and more economical setting of P=Q to draw, see Büsing 1983.)
- 1996 Marks, U. *Šachová skladba* 53, ix.1996. White Kb1 (1), Black Zebra g4 (1), whoever is to move wins. The zebra moves like a knight, but three squares and two instead of two and one (Ze4 can move to b6, c7, g7, h6, h2, g1, c1, b2). White to play, 1 Kb2 Ze7 2 Kc2 Zh5 3 Kc3 Zf8 4 Kd3 Zd5 5 Kd4 (a manoeuvre not possible against a knight) Z-- 6 Kd5; Black to play, 1...Zd6 2 Ka1 (2 Kc1 Zf3 3 K-- Zc1) Zf3 3 Ka2 Zc5 4 K-- Za2.
- 1997 Beasley, J. D. *The Problemist*, i.1997. White Nc2/g1 (2), Black Pd3 (1), White to play and win. 1 Ne2 and either 1...dxc2 2 Nc3 c1B 3 Na2 (if 2 Nd4 c1B 3 Nc6 then 3...Bh6) or 1...dxe2 2 Nd4 e1B 3 Ne6 (if 2 Ne3 e1B 3 Ng2 then 3...Bh4). This is perhaps the simplest setting yet of the alternative wins for a knight against a bishop's or centre pawn, though everything after the first move appears in the line 1...d4 of Evseev's 1992 *phénix* study. 1 Nf3/Nh3 dxc2 and 2...c1B; 1 Na1/Na3/Nb4/Nd4/Ne3 d2 and 2...d1B, with a win for Black in every case; 1 Ne1 d2 2 N(e)-- d1B similarly, or 2 N(g)-- dxe1N.
- 1997 Beasley, J. D. *Variant Chess* 25, autumn 1997. White Nh3 (1), Black Kh8, Ng8 (2), White to play and win. A much lighter affair: 1 Nf4 (1 Ng5 loses immediately, and if 1 Nf2/Ng1 then 1...Kh7, after which Black will leave his king at h7, win the N v N battle without allowing wN to sacrifice itself to bK, and then win with K v N) Nh6 2 Ng6 N-- (if 2...K-- then 3 Nh8 wins immediately) 3 Nxh8 and wins with N v N.
- 1997 Beasley, J. D. *British Endgame Study News*, special number 8, xii.1997. "Promotion studies in the Losing Game" (pp 2-3). An article on simple promotion studies, containing nothing new.
- 1997 Beasley, J. D. *Variant Chess* 26, winter 1997. Two studies with N to win against two unmoved pawns,

described as “theoretical studies: the positions are natural (or at least simple) and the solutions are strategically motivated, but the play is not unique. An unmoved knight’s or rook’s pawn wins against a knight, so Black will hope to advance one pawn, force White to capture it, and then win with the other: moving it one square or two as appropriate and winning by promoting to bishop. It follows that White must force the second pawn to move and commit itself before he captures the first.” In the first study, White Nd1 (1), Black Pb7/g7 (2), we have 1 Ne3 and now two lines: (a) 1...g5 2 Ng2 g4 3 Ne1 g3 4 Nd3 g2 5 Ne5 b6 6 Nf3! g1- (6...b5 7 Nd2) 7 Nxc1 b5 8-9 Nc3, and (b) 1...b6 2 Ng2 b5 (2...g6 3 Ne3 g5 4 Ng2 g4 5 Nf4 g3 6 Nd3) 3 Ne3 with the echo line 3...b4 4 Nd1 b3 5 Ne3 b2 6 Nd5 g6 7 Nc3 b1- 8 Nxb1 and 9-10 Nf3. In the second, White Nd3 (1), Black Pa7/h7 (2), we have 1 Ne5 h6 2 Nc4! a6 (2...a5 3 Nxa5 h5 4-6 Ng2) 3 Ne5 a5 4 Nd3 a4 5 Ne5 a3 6 Nd3 a2 7 Nc1! a1B (7...h5 8 Nxa2 h4 9-11 Ng1) 8 Na2 Bc3 9 Nxc3 h5 10-11 Ng3. However, although 1 Ne3 in the first study is White’s most natural move, since it meets two of Black four moves by immediate sacrifices, 1 Nb2 works just as well (see below) and 1 Nf2 actually forces the win one move sooner. We have 1...g5 2 Nd3 g4 3 Ne1 rejoining line (a), or 1...g6 2 Nd3 b5 3 Nb2 b4 4 Nc4 b3 5 Ne3, or 1...b5 2 Nd1 g5 (2...g6 3 Ne3) 3 Nb2 b4 4 Nd1 b3 5 Nc3 b2 6 Ne2 echoing the play after 1...g6, or 1...b6 2 Ne4! (avoiding the need to manoeuvre wN round to d5) g5 3 Nxc5 and 4-5 Nc3.

(If the echo in the first study is thought worth rescuing, it could be done by starting wN on b2/c2/f2/g2 instead of d1. Suppose wNg2, and play the natural move 1 Ne3; then, as before, we have 1...g5 and 2-4...g2 forcing 5 Ne5 and 1...b6 and 2-5...b2 forcing 6 Nd5. 1 Ne1 leads to the same thing (Black’s additional moves 1...b5 and 1...g6 lose more quickly). The precision can be further increased, at the cost of a less natural starting position, by starting wN on a4 or h4. Suppose wNa4; now 1 Nb2 is White’s only move, and leads once more to 1...g5 and 2-4...g2 forcing 5 Ne5 and to 1...b6 and 2-5...b2 forcing 6 Nd5, while 1...g6 is met by 2 Nd3 with a quicker win.)

1997 Beasley, J. D. *diagrammes* 123, x-xii.1997. Article “Quelques études en ‘qui perd gagne’”. A survey article, containing nothing new apart perhaps from the example used to show the absence of a simple rule for two knights against one (White Na3 to play against Black Nb8/Nd1 loses, move everything one file right and White to play wins).

(1997) van der Bilt, V. Internet (copy downloaded in 2000, dated from internal text). Six studies and problems which were clearly composed independently but in fact largely rediscovered manoeuvres already known.

- White Nc6 (1), Black Pa7/e7 (2), White to play and win. 1 Nxa7 e5 2-5 Nd4 e1B 5 Ne6, not 1 Nxe7 a5 and Black wins. This is a simpler version of Slater 1935.
- White Re1, Pd3/f3 (3), Black Nb8 (1), Black to play and win. 1...Nd7 2 Re5 Nxe5 and we have the theme of Evseev 1992.
- White Kc5, Bh2, Pa6/c6 (4), Black Rh8 (1), White to play and win. 1 Bb8 Rxb8 2 Kb6 Rxb6 3 a7! Rxc6 4 a8B, but not 3 c7 which loses.
- White Rb8, Pa4/g2 (3), Black Nf7, Pa5 (2), White wins in 4 moves. 1 Rh8 Nxb8 2 g4 (2 g3 loses) Ng6 3 g5 N-- 4 g6.
- White Ka5, Pc5/h2 (3), Black Pb7/c6 (2), White to play and win. 1 Ka6 bxa6 and now we have Törngren 1929: 2 h3! a5 3-6 h7 a1R 7 h8B.
- White Ph4/g2 (2), Black Kb7, Qb6, Ra2/b1, Bd3/d2, Nb8/a1, Pc7/a6/c5/d5/g5/a4/b4/g4 (16), Black wins in 17 moves. White’s last move must have been h2-h4, so 1...gxh3 e.p. 2 gxh3 g4 3 hxg4 Bf5 4 gxf5 Qe6 5 fxe6 Nd7 6 exd7 Ka8 and wins against all promotions. The composer says “only move” after 6...Ka8 and gives an explicit refutation of 6...Kc8 (7 dxc8B and Black will never lose his own B), but Black’s position is loose and *Giveaway Wizard* thinks that several other moves are as good. This is really a problem rather than an ending, but I have given it in detail because it combines the themes of en-passant start and 16-man clearance in a minimal setting.

(The precise dating of Internet material is a matter of difficulty because documents can be altered without the change being apparent, and perhaps pedantically I have put all Internet dates in brackets, but this merely acknowledges the nature of the subject and should not be construed as a comment on the integrity of any author or provider of material. For that matter, the date on the front of a printed magazine is not always a reliable indication of when it finally gets into the hands of its readers.)

(1997) Geerlings, V. Internet. White Pf7 (1), Black Nc3, Pa2 (2), White to play and win. I haven’t seen the solution as posted, and am relying a copy sent to me by Fabrice Liardet plus some computer analysis. 1 f8B (1 f8Q a1K and 1 f8K Ne4 2 Ke8/Kg8 a1R both win for Black, 1 f8R a1K is drawn) and now 1...a1B/K 2 Ba3 is won for White, hence either 1...Ne2 2 Ba3 Nf4 (2...Nc3/Nd4 3 Bb2, 2...Ng1 3 Bc1, 2...Ng3 3 Bc1 Nh1 4 Bb2 and either 4...Nf2 5 Bd4 or 4...Ng3 5 Be5) 3 Bb2 Ng2 4 Ba1 and wB will

attack bN at the next move and force bP to advance, or 1...Nd1 2 Bd6 Nb2 (2...Ne3/Nf2 3 Be5, 2...Nc3/a1K 3 Ba3) 3 Bb4 a1K 4 Ba3.

1997 Liardet, F. *Variant Chess* 25, autumn 1997. White Nd7, Pe7 (2), Black Nh4 (1), White to play and win. A study which illustrates the winning plan with BN v N (see Panteleit 1975 and Liardet 1991). 1 Nf6 Nf5 (1...Ng6 2 e8B is worse and other moves allow 2 e8K) 2 e8B Nd4 (2...Nh4 3 Bb5 followed by a knight move and eventually a bishop sacrifice) 3 Nd7 (“the key move”) Nb5 4 Bf7 Na7 5 Be6 Nb5 6 Bc4 and 7 Bb5 wins. All non-trivial refutations of alternative first moves are given: 1 e8K Nf5 (threatening 2...Ne7, and if 2 Ke7 then 2...Nxe7 and wins with N v N); 1 e8R Ng6 with similar play; 1 e8N Nf5 2 Nc7 Ng3 with a draw; 1 Nb8/Nb6 Ng6 2 e8B Nf8 threatening 3...Nd7/Ng6, and if 3 Bg6 then 3...Nxc6 again gives the N v N win to Black; 1 Ne5 Nf5 2 e8B Ne7 similarly.

1997 Liardet, F. *Variant Chess* 26, winter 1997. Two studies.

- White Ng5, Ph5 (2), Black Nd7, Pf5 (2), White to play and win. The author writes, “What must be realised is that the RN v K ending is a draw, unless the king can be kept on the first rank by a knight on the fifth. The QN v K ending never wins for QN, well almost never ...” The magazine publishes the author’s full solution, even though it occupies almost a complete column. Let’s refute the knight moves first. 1 Nh3/Ne6 lose against 1...f4 2 Nxf4 Nf8! 3 Ne6 Nxe6 and 4...Ng7. 1 Nf3/Nf7 lead to 1...Ne5 2 Nxe5 f4 and a draw by 3-5...f1K (for example, 3 Nc4 f3 4 h6 f2 5 Ne5 f1K 6 h7 Kg1!). 1 Nh7 leads to 1...Nf8 2 Nxf8 f4 and again a draw by 3-5...f1K; the white knight being too far away, RN v K will not be won (for example, 3-5 h8R e1K 6 Ne6 Ke2 7 Rh4 Kd2 8 Rf4 Ke1! 9 Ra4 Ke2 etc). 1 Ne4 fxe4 2 h6 is met by 2 e3 3 h7 Nf6! 4 h8B (4 h8N loses quickly to 4...Nh7, Black sacrificing his existing N and then promoting bP to a new N) e2 5 Bxf6 f1K and yet another draw. This leaves 1 h6, after which any bN move is met by 2 Ne4 and 3-4 h8R. 1...f4, therefore, and now 2 Ne4 (2 Nh7 Nf8 leads into the line after 1 Nh7, and other moves lose at once). Now White threatens 3 Nf6 and 4 h7, if 2...Nb6/Ne5 then 3 Ng3 fxc3 and 4-5 h8R will win, and if 2...Nb8 then 3 h7 f3 4 h8R! N-- (4...f2 5 Nxf2 N-- 6 Rb8 and wins with N v N) 5 Rb8 Nxb8 6 Nc3 f2 7 Ne4 f1B 8 Nf2 and after bB sacrifices itself White wins with N v N. So bN must sacrifice itself, and we have two lines. If 2...Nf6 3 Nxf6 f3 then 4 h7 f2, and now what? White knight moves allow 5...f1B with a draw (though not 5...f1R, after which 6 Nf6 Rxf6 7 h8B wins), and promotion to Q does not win in spite of the excellent position that wN will have on d5; the Black king stays on e1 and f1, and if necessary g1, and White cannot make progress. Hence 5 h8R! and now 5...f1K 6 Nd5! wins; given as an illustrative line is 6...Kg2 7 Re8 Kh3 8 Rf8 Kh4 9 Rf6 Kh3 10 Rf5 Kh2 11 Rf4 Kh1 12 Rf3. Alternatively, we have 2...Nc5 3 Nxc5 f3 4 h7 f2, and now 5 h8R f1R! is a win for Black. This time 5 h8Q! works, however: 5...f1K 6 Qh6! (this is a position of reciprocal zugzwang, White to move could not win) Kg2 7 Qh1! Kxh1 8 Ne4 and White has one of the exceptional winning positions with N v K.

- White Pd6/h6 (2), Black Kb5, Nh8 (2), White to play and win. 1 h7 and now Black has four ways to force a unique promotion by White. (a) 1...Ng6 2 h8- Nxb8 3 d7 Ng6 (for 3...Kb6 see below) 4 d8R Nh4 5 Re8 Kc4 (say) 6 Re2 Ng2 7 Rxc2 and wins with R v K. “KN v R is usually a draw, but the king and knight lose if they are disconnected.” (b) If in the above line Black plays 3...Kb6, we have 4 d8K, after which White can force bK to sacrifice itself (4...Kc5 5 Kd7 Kd4 6 Kd6 Ke3 7 Ke5 etc) and win with K v N. (c) 1...Kc5 2 d7 Kd5 3 d8B and wins, for example 3...Ke4 4 Bc7 Kd3 5 Bb6 Kc2 6 Ba5 Kb1 7 Bd2 Ka2 8 Bc1. (d) 1...Kb6 2 d7 Ka5 3 d8K Kb4 4 Kd7 Kc3 5 Kd6 Kd2 6 Kd5 “etc”. Once again White will force bK to sacrifice itself, leaving a win with K v N.

(1997) Liardet, F. Internet (I am relying on a copy sent to me by the composer). White Pa5/f6 (2), Black Pf4 (1), White to play and win. 1 f7 f3 2 f8N (2 f8K f2 3 a6 f1B draw) f2 3 Nd7 (“not 3 a6 f1K with a drawn ending RN v K”). Now queen and rook lose immediately and promotion to knight is also hopeless, leaving 3...f1K 4 Ne5 Ke1 5 a6 Kd1 (5...Kd2 6 Nd3) after which 6-7 a8R will give a winning RN v K ending thanks to the centrally posted wN, and 3...f1B 4 a6 Bxa6 5 Nb8 with an exceptional win with N v B.

1998 Beasley, J. D. (discovered by computer). *Variant Chess* 27, spring 1998. White Nd5/g2 (2), Black Ra8 (1), White to play and win. Black to move would lose at once; White to move plays 1 Ngf4 (Nge3 is equivalent by symmetry) Ra1 2 Ng6 Ra2 3 Nge5 Ra8 (3...Rh2 4 Nb6 Rh1 5 Nbc4 Rh8 6 Nb2 with an echo of the original position, 3...Ra1 4 Nf6 Ra2 5 Nfd7 and either 5...Ra1 6 Ng4 winning immediately or 5...Rh2 6 Nb6 with the same position as after 3...Rh2 4 Nb6) 4 Ng4 Ra1 5 Ngf6 Ra2 6 Ng8(!) Ra1 7 Nge7 Ra2 (7...Rh1 8 Nb4 with an echo of the position after 3...Ra1 and 5...Ra1 6 Ng4) 8 Ng6 Ra1 9 Ngf4 Ra8 10 Ng2 and we are back at the starting position with Black to move. This study has been reprinted several times, the use of a knight to transfer the move to the opponent being unusual in any form of chess, but only this first appearance is listed here.

(A few words on “computer discovery” may not be out of place. Provided that the programmer has access to a sufficiently powerful machine, the construction of a definitive table of results for any particular combination of material is straightforward, and all that is then necessary is to search it for interesting positions. Even this can be largely done by computer, for example by calling for the longest win, for the positions of reciprocal zugzwang, and for any positions where a player has a significantly shorter win if it is his opponent’s move. But while the work involved is vastly less than in conventional composition, not least because the “composer” does not spend time analysing positions which eventually prove to be unsound, it does not follow that the positions that result are less interesting. Paul Byway wrote in *Variant Chess* about the two positions in the next item: “These discoveries, dredged from the sea of possible positions, have a gem-like quality that seems to be missing from most of our more laboured, human constructions.”)

- 1998 Beasley, J. D. (discovered by computer). *Variant Chess* 28, summer 1998. Two studies.
- White Ng1 (1), Black Bc1, Na8 (2), White to play and win. 1 Ne2 loses to 1...Nb6 2 Nxc4 Na4, and 1 Nh3 only draws: 1...Ba3 2 Nf4 Bc5 3 Ng6 (Nh3/g2/e2 are as good, but nothing is better) Bb6 4 Nf8 Bc5 etc. White must cramp bB more closely: 1 Nf3 Ba3 2 Nd2 Bd6 (holds out longest) 3 Nb3 Bg3 (3...Bb8/Bh2 are also met by 4 Nc5) 4 Nc5 Bb8 (threatening 5...Nc7) 5 Ne6 (the only move to prevent this), and White will sacrifice next move. A move NxB will win for White if bN is on a light square, but lose if it is on a dark.
 - White Kg4, Nf8 (2), Black Qb2 (1), White to play and win. A long-range lose-a-move manoeuvre: 1 Kh4 Qa1 2 Kg3 Qc1 (2...Qa5 3 Kg2/h2 and bQ is dominated) 3 Kh3 Qa1 4 Kh4 Qb2 5 Kg4 (now we are back at the starting position but with Black to move) Qa1 6 Kf3 Qa5 7 Kg2 and again bQ is dominated.
- 1998 Beasley, J. D. *Variant Chess* 30, winter 1998. An article “Losing Chess in Geneva” reporting the meeting held in September 1998 (see Liardet 1998).
- 1998 Beasley, J. D. *Variant Chess* 30, winter 1998. White Ne1 (1), Black Na8, Pe7 (2), White to play and win. White’s aim is to force Black to play ...e6 while bN is on a light square, after which he can expect to win (given as a typical line is 1 Nc2 e6 2 Ne3 e5 3 Nf5 e4 4 Nh4 e3 5 Nf3 e2 6 Nh2 e1B 7 Nf1 threatening Nd2/Ng3 sacrificing wN, with an N v N win if Black sacrifices bB first). Black can try and defend either by playing ...e5 while bN is on a dark square, when lines such as the above will lose, or by playing ...Nd6 while bP is still on e7, “e.g. 1 Nf3 Nc7 2 Nd4 Ne8 3 Ne2 Nd6 and White is running short of squares”. Hence 1 Ng2, ready to meet 1...Nc7 with 2 Ne3 and if say 2...Na6 then 3 Ng4 e6 (3...e5 4 Nxe5 is a win for White) 4 Nf6 etc, or 1...Nb6 2 Nf4 Nc4 (say) 3 Nh5 and much the same. 1 Nc2 is met by 1...Nb6, 1...Nd3 by 2 Nc7, 1 Nf3 by both moves. “This is essentially a strategic ending and there are many alternatives later in the play, but White’s first two moves are unique.” The computer has sharpened Black’s answers to incorrect White first moves, Black having a win in 11 moves at most.
- 1998 Beasley, J. D. *British Endgame Study News*, special number 13, xii.1998. “Computer discoveries in the Losing Game” (pp 2-3). An article containing various positions either discovered by the computer or shown by the computer to be unique: the win with Nb1 v Nh8/Na6 (Evseev 1992), the draws with Qh4 v Kc6/Ba8 and Kc6/Bb7 (Byway 1995), the draw with Bd1 v Qd6/Na8 (play 1 Ba4 Qf4 with a reflection of the position), the reciprocal zugzwangs with Bh6/Bc1 v Kc6 and Qb8/Qf8 v Kd3, and the win with Ng2/Nd5 v Ra8 (Beasley 1998).
- 1998 Byway, P. V. *Variant Chess* 27, spring 1998. Four studies, one a twin.
- White Kb4, Pc5 (2), Black Pd4 (1), White to play and win. 1 c6 (no note is given, but if 1 Kc3 dxc3 then 2-3...c1K certainly won’t lose) d3 2 c7 (2 Kb3 d2 3 Kb2 d1B 4 Ka1 Bc2 5 Kb1 Bxb1 6 c7 Be4 and wins) d2 3 c8Q! (we’ll look at 3 c8R later, but 3 c8B loses against 3...d1R, 4 Bd7 Rxd7 being a win for R v K, 3 c8N loses against 3...d1B 4 Kc5 Be2 etc, bB eventually forcing wK to sacrifice itself and then winning with B v N, and 3 c8K allows 3...d1R forcing 4 Kb7, after which bR will patrol the d-file and neither wK will dare venture on to the c-file) d1N (else two immediate sacrifices) 4 Kc5! (Black threatened 4...Nc3) Nb2 (now the threat is 5...Nc4) 5 Kc6 Nd3 (threat 6...Nc5) 6 Kc7 Nb4 (if White had played 3 c8R instead of 3 c8Q, he would now be lost) 7 Qa6 and 8 Kb8. If Black tries say 6...Ne5, White plays 7 Qg4 and wins with K v N. A most elegant piece of work, even though the manoeuvre with N v KQ or KR had already been shown in Kuhlmann 1980.
 - White Pf7 (1), Black Kd5, Qe1 (2), White to play and win, twinned with bRe1 instead of bQ. In each case, 1 f8N Ke4 2 Nd7 Ke3 3 Nf6 Ke2, and now 4 Ng4 wins against bQ (not 4 Nd5) and 4 Nd5 wins against bR (not 4 Ng4). A simpler but delicately pointed essay on the same theme.
 - White Ph6 (1), Black Ke7, Ba1 (2), White to play and win. 1 h7 Kf6 2 h8K (2 h8R Bd4!) Ke5 and now given is 3 Kg7 Kd4 4 Kf6 Kc3 5 Ke5 Kb2 6 Kd4 and sacrifices next move, but while this

is undoubtedly the crispest way to win the computer says that 3 Kg8 etc is just as good; White need not crowd bK quite so closely. The unique refutation of 2 h8R is worthy of note (against 2...Bb2/Bc3 or 2...Ke6/Ke5, White can attack bB and win with R v K).

- White Kf8 (1), Black Kf4, Bc1 (2), White to play and win. 1 Kg7 Ke3 2 Kf6 Kd2 3 Ke5, and this time the wK play is precise (he must keep within range of both a3-f8 and c1-h6).
- (1998) Kohli, L. Internet (I am relying a copy sent to me by Fabrice Liardet). White Ra2, Ng4, Pd2 (3), Black Pd4 (1), White to play and win. Not 1 Rc2 d3 and White has no good move, but 1 Rb2 d3 2 Rc2 dxc2 3 Ne5/Ne3/Nf2. The alternatives at move 3 could be eliminated by starting wN at g6.
- 1998 Liardet, F. *Bulletin Genevois des Echecs* 36, ix-xii.1998. White Pd5/b2/f2 (3), Black Rb5/f5 (2), White to play and win. Play 1 d6 Rxb2 (say) 2 d7 Rxf2 3 d8B; Black can sacrifice one rook, but then loses with R v B. If 2...Rbxf2 then 3 d8N.
- (1998) Liardet, F. *Au coin du bois* 1998 (I am relying on a transcription sent to me by the composer). White Ra4, Pf7 (2), Black Kg5/h3 (2), White to play and win. It is usually impossible to win against two kings, but here White can profit from their bad position. 1 Rh4! Khxh4 (if 1...Kg4 then simplest is 2 f8Q Kh2 3 Qa3, though 2 f8R also wins) 2 f8N! Kgg4/Kf4 (2...Kg6 3 Nxg6 with an N v K win) 3 Nh7! and the knight will sacrifice itself on g5.
- 1998 Liardet, F. *Variant Chess* 27, spring 1998. Two studies.
- White Ke5, Pd7/g5 (3), Black Kh7, Rc6, Bb7, Nb5 (4), White to play and win. 1 g6 Rxc6 (1...Kxc6 2 Kf5! Kxf5 3 d8K) 2 Kd5 Bxd5 3 d8N! Bf7 (3...Bb7 4 Nxb7 and 5 Nd6) 4 Nxf7 and either 4...Rg5 5 Nxg5 or 4...Kh8 5 Nxb8, in each case winning the N v N ending if Black waits to be taken and sacrificing if he moves away. It is a remarkable pair of wins in normally lost endings with knight against knight and another man, based on exceptional winning positions with N v K and N v R.
 - White Na4, Pg7/h7 (3), Black Rf1, Pd2 (2), White to play and win. “Tries are easy to refute,” says the published solution: Black threatens 1...d1R winning, and 1 Nc5/Nb6 2 d1B, 1 h8N Rf7 2 Nxf7 d1B, and 1 g8K Rf8 2 Kxf8 d1R 3 --- Rd3 all ensure at least an easy draw. Play starts 1 g8B! Rf7 (White threatened 2 Bf7 etc, against most R moves along the rank he can give away B and N and win by 4 h8R, and 1...Rd1 2 Be6 merely delays this by one move) 2 Bxf7 d1R (2...d1Q/B/N are easy, and after 2...d1K we have 3 Nb2! K-- 4 Nd1 Kxd1 5 h8R). Now 3 Bd5 Rxd5 4 Nc5 Rxc5 is hopeless, but 3 Bh5! dominates the rook in a remarkable fashion; the only non-trivial lines are 3...Rd2/Re1 4 Be2 Rxe2 5 Nb2 Rxb2 6 h8B!, 3...Rd3 4 Bf3 Rxf3 5 Nc3 Rxc3 6 h8B similarly, and 3...Rb1/Rd6 4 Nb6 Rxb6 5 Bg6 Rxc6 6 h8N! Once again it is a remarkable combination of exceptional winning positions, this time with N v R and B v R.
- These were set as competition pieces, but only one solver cracked the second study and none at all cracked the first.
- 1998 Liardet, F. *phénix* 62, iv.1998. White Re8, Pc7 (2), Black Ka6, Nd7 (2), White to play and win. The solution is 1 Rb8 Nxb8 2 cxb8N with an exceptional win with N v K, familiar ground by 1998, but it is heightened by the try 1 Rf8 Nxf8 2 c8B, met only by 2...Nd7 3 Bxa6 Nb8 with an exceptional win for Black with N v B on the same two squares.
- 1998 Liardet, F. *phénix* 65, vii-viii.1998. White Rb6, Pf7 (2), Black Pe2 (1), White to play and win. 1 Rf6 e1B (1...e1N 2 Rf3 Nxf3 3 f8R, 1...e1K 2 Ra6 and 3 f8B) 2 Rf2 Bxf2 3 f8R with an exceptional position where a bishop to play loses against a rook. This is heightened by the try 1 f8R, defeated only by 1...e1B. Either wR can now sacrifice itself independently against bB, but in each case this sacrifice leaves bB attacking the other wR and this time it is the bishop that will win.
- 1998 Liardet, F. *Schweizerische Schachzeitung*, ix.1998. An article “Quelques finales en ‘qui perd gagne’ ” including three examples described elsewhere in this document.
- 1998 Liardet, F. *Eteroscacco* 83, ix-x.1998 (pp 10-14), and 84, xi-xii.1998 (pp 3-8). “Premières rencontres internationales d’échecs à qui perd gagne”, a report of an international meeting held in Geneva on 12-13 September 1998, with the games played. Such endings as were reached tended to be misplayed in time scrambles, but one was of interest in spite of this: White Re6, Ph4 (2), Black Pf4 (1). White played 29 h5 (it is normally correct in endings to push any remaining pawns as fast as possible), and play continued 29...f3 30 h6 f2 31 h7 f1R? (31...f1B would have drawn) 32 Rf6 Rxf6 and 33 h8B would have won had White’s flag not fallen before he could play it. But for once, pushing the pawn was wrong. The correct line was to leave wP on h4 and play wR to e5, say 29-30 Re7 f2 31 Re5. Now 31...f1Q/R/B lose off-hand, 31...f1N is met by 32 Rf5 N-- 33 Rf1 Nxf1 34-37 h8B, and 31...f1K by 32 Ra5 and promotion to R or B as appropriate. It is an interesting example of the way in which the ending K v RB can occur naturally in play. Another game from the meeting would have ended with the same material had not the defender made a slip at an earlier stage.

1998 Liardet, F. *Variant Chess* 30, winter 1998. Two studies, one a twin.

- White Rd1, Pd3 (2), Black Ph3 (1), White to play and win, twinned by moving everything one file to the left. As set, 1 Ra1 (1 d4 h2 and either 2 Rd2 h1K or 2 Rd3 h1N 3 Rd1 Ng3 4 Rd3 Nh1) h2 2 Ra4 h1B (2...h1N 3 Ra5, 2...h1K 3 d4 Kg2 4 d5 Kf3 5 Ra1 Kf4 6 d6 Kf5 7 d7 Ke5 8 Rb1 and promotion to R or B) 3 Ra8 Bxa8 4 d4 and Black can either block wP or allow it to sacrifice itself. One file to the left, 1 c4 (1 Ra1 g2 2 Ra4 g1B, 1 Rd1 g2 2 Rd4 g1K) g2 2 Rc2 (2 Rc3 g1N) g1K (2...g1N 3 Re2 Nxe2 4-7 c8N) 3 Rh2 Kxh2 4-7 c8R.
- White Ng1 (1), Black Ka1, Rb4, Nd3 (3), White to play and win. 1 Ne2 Nc1 (1...Rd4 2 Nxd4 Nb2 3 Nc2 N-- 4 Nxa1) 2 Nxc1 and either 2...Rb3 3 Nxb3 with an exceptional N v K win or 2...Ka2 3 Nxa2 with an exceptional N v R win.

(1999) “Angrim” (Ben Nye). Internet (copy forwarded to me by Fabrice Liardet). Build notes on a two-man and three-man database, excluding positions without pawns. Each entry gives the White and Black men, the percentages of draws and longest wins (to end of game), a position leading to the longest win and the length of this win, and a sample drawing position. The data appear to have been calculated using the “FICS” (Free Internet Chess Server) rule that a stalemate is a win for the player who is left with fewer pieces. The longest wins overall appear to be “66 ply” (33 moves) in the endings QP v P (Qa7/Pa3 v Pg3) and PP v P (Pa2/Pb2 v Pf6).

(1999) “Angrim” (Ben Nye). Internet (annotated copy forwarded to me by Fabrice Liardet). Similar build notes on a four-man database. Again there is no specimen play, but specific positions are commented as follows (White always listed first and always to play, and the positions are longest wins unless stated otherwise).

- Ka1/Kd1 v Bf1/Ng1 (54 ply): “at first this looks like it is the 2 kings that are on the defense, they have to retreat to the A column before they are able to recover.”
- Nd3/Nb1 v Kh3/Kh2 (14 ply): “cool position, the win involves a whole series of special cases well worth studying.” See Liardet below.
- Ka1/Be1 v Kg5/Qh5 (18 ply): “interesting position”.
- Kc6/Ba8 v Qh3/Rg4 (8 ply): “another interesting one ... looks neat, and black is in kind of zugz as it would rather not move.” Liardet comments that the position after 1 Bb7 is in the list of four-piece “win-loss” reciprocal zugzwangs described below. In the given position, Black to play would win by 1...Re4/Rg2/Qh4 (lines such as 1...Re4 2 Kd7 Qxd7 3 Bxe4 are lost for White), but after 1 Bb7 White can meet rook moves by 2 Bc8, while 1...Qh4 allows 2 Ba6.
- Pc7/Pa2 v Kh3/Bg1 (60 ply): “a4 doesn’t win, see why? might make a good study”.
- Kd1/Ne1 v Kc5/Qc8 (26 ply): “very positional, tempo oriented, the winning moves hardly seem to be doing anything. If you understand this position cheers for you :)” (I read the final “:)” as an Internet “smile” symbol). *Giveaway Wizard* plays 1 Kc1 Kc6 2 Kb2 Kc5 3 Ka2 Qc7 4 Kb1 Qc8 5 Kb2 Qc7 6 Kc2 Qc8 7 Ng2 Kc6 8 Kc3 Kc7 9 Ne1 Kc6 10 Nd3 Kc7 11 Kd4 Qf8 12 Nf4 Qxf4 13 Ke3 Qxe3. White must advance wK before playing Nd3 (if 2 Nd3 then 2...Qg8 draws), while to play Kc2 with wN on e1 and bQ on c8 loses off-hand to ...Qa6. Even so, a move such as 3 Ka2 must count as remarkable.
- Kc1/Rf6 v Rg8/Na5 (28 ply), described as “rather tricky”: “idea is for white to sac its rook such that black must then sac its rook.” *Giveaway Wizard* plays 1 Rf1 Ra8 2 Rd1 Nb7 3 Rd8 Nxd8 4 Kb2 etc, with a win for K v N after Black has sacrificed bR. Angrim comments that a nicer looking one is Kd5/Rd6 v Rd1/Nd3 “which is highly tempo oriented, hard for a human (this one) to see the right moves”, and Liardet includes this latter in his page of studies found by computer described below.
- Nc2/Nd1 v Qb7/Bb5 (12 ply): “the first winning move is rather nice, it looks so harmless”. Angrim comments that this position is trivial for computers but fun for humans, and Liardet includes it in his page of studies found by computer.
- Nh8/Na1 v Nf2/Nd1 (94 ply): “in general wins with 2 knights give me a headache”. Given as a sample draw is Na1/Nb1 v Nd1/Ng1, but a “neater looking draw” is Nd4/Nf2 v Nc4/Na2. More surprising are the statistics “17.55% draws, 26.71% non-trivial wins”, but Angrim appears to regard a win as “trivial” only if White can immediately sacrifice all his men and presumably most of the “non-trivial” wins are positions where White has an immediate sacrifice leaving a win with N v 2N.
- Pa7/Pb5 v Rd6/Re6 (“draw”): “only a draw under FICS rules, is a white win under international rules.” White cannot sacrifice both men, but 1 a8N leads to stalemate.
- Qa1/Pa2 v Rh3/Pg3 (“draw”): “another tricky draw, depends on the FICS rule that stalemate with

equal pieces is a draw". *Giveaway Wizard* plays 1 Qd4 (threat 2 Qh4 and 3 a4) Rh4 2 Qxh4 g2 3 Qh5 g1K 4 Qh2 and 5-9 a8R; the draw under FICS rules presumably involves playing 3...g1N, when 4 Qh3 only draws (bN can get back to a8 in front of wP) and 4 Qg6 N-- 5 Qg1 loses because bN can get back to b8.

- Kb1/Bf6/Ne5 v Ka4 (148 ply): "takes over 128 ply even using distance to conversion and is actually a draw by 50 turn rule. This is the longest 4pc forced win that does not involve pawns." Some endings with pawns depend on KBN v K in some lines, for example Ka7/Bb3/Pd5 v Kh1 (144 ply), Ka1/Ne4/Pd7 v Kg1 (146 ply), Ka3/Pb7/Pd3 v Kc1 (146 ply), Bb2/Nc1/Pf3 v Kg1 (174 ply, "wow *^^^^^^^^^^^^^^^^*"), Ka3/Bf2/Nh2 v Pe4 (152 ply, "would be a draw by 50 move rule, pawn converts in first few turns), Ka7/Bc4/Pd2 v Ph4 (150 ply), Ka1/Nh1/Pd6 v Pg4 (152 ply), Bd2/Ng1/Pf3 v Pg3 (174 ply, "wow *^^^^^^^^^^^^^^^^*") ("this win is a draw by 50 move rule, last pawn move is a conversion into KBN vs K with 'win' in 139 ply"), Nd8/Pe5/Pf5 v Pd4 (146 ply: "this win is a draw under the 50 move rule, with best play it reaches KBN vs K with a 'win' in 129 ply). The 174-ply wins with BNP v K and BNP v P are the longest four-man wins of all. Angrim remarks that 0.31% of BNP v K positions are wins taking between 128 and 174 ply.
- Qc4/Nd6/Pf2 v Kh1 (138 ply): "this is a win even with the 50 move rule, because it includes pawn shoves within the last 100 ply!"
- Bb1 v Nc4/Ne2/Ng1 (draw): "non-trivial draw, no pieces ever get saced". See Liardet below.
- Kc4/Pd3/Pd2 v Pb6 (142 ply): "this win is not a draw by 50 move, with best play the last pawn move is d8K a conversion into KKN vs K with win in 81 ply".
- Qf1/Nd6/Pf2 v Ph2 (140 ply): "not a draw by 50 move, in fact after 40 ply the white pawn has moved only 1 square! This is an incredible positional battle which I won't even pretend to understand :-)) the pawn eventually converts (to a king) after 59 ply, for a won KNQ v K endgame".

It should perhaps be stressed that these are first comments on a massive set of data which did not become available until very late in the period under review. A similar survey made a year or two hence might show considerable amplification. See also Liardet below.

- (1999) "Angrim" (Ben Nye). Internet (annotated copy forwarded to me by Fabrice Liardet). A listing of non-trivial three-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving at least one pawn. Some positions in the endings N v BP, N v NP, N v PP, P v NN, P v NP, and P v PP are omitted. The "ply" counts are one higher than might be expected (for example, Qa8 v Bh6/Pg7, with typical play WTM 1 Qh1 Bc1 2 Qxc1 g5 3 Qxg5 and BTM 1...g6 2 Qf8 Bxf8, is given as "loss in 6/4" although only 5 and 3 moves are actually played). See also Liardet below.
- (1999) "Angrim" (Ben Nye). Internet (annotated copy forwarded to me by Fabrice Liardet). A listing of all non-trivial four-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving neither knights nor pawns. See also Liardet below.
- (1999) "Angrim" (Ben Nye). Internet (annotated copy forwarded to me by Fabrice Liardet). A listing of all non-trivial four-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving precisely one knight or pawn. The following specific position is commented:
- Ba8/Pa7 v Qh6/Rc1 ("loss in 10/8"): "I didn't believe the following one was valid at first, very tricky". White to play, 1 Bc6/Bh1 (best) RxB and wins (2 a8N is best but doesn't hold out for long); Black to play, 1...Qc6/Qh1 (best) 2 BxQ RxB 3 a8B.
- See also Liardet below.
- (1999) "Angrim" (Ben Nye). Internet (copy forwarded to me by Fabrice Liardet). A listing of non-trivial four-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving two knights or pawns. If an ending contains not more than six such positions, all are given; otherwise, only six are given.
- 1999 "Angrim" (Ben Nye) (discovered by computer). *Variant Chess* 32, summer 1999. White Ka6/f2 (2), Black Qh8, Rc8 (2), White to play and draw. 1 Ka7 Rd8 2 Kf3 Rc8 3 Kf2 Rd8 4 Kf3 etc. If White relaxes the pressure, Black wins by taking one of the kings: 1 Ka5 Rc3 2 Kf1 Rc2 etc, or 1 Kg3 Qh2 2 Kxh2 Rc2. Black also wins if White deviates from the main line at a later stage: 2 Kb7 Rc8, or 3 Ke2 Rb8.
- 1999 Beasley, J. D. *Three-man pawnless endings in Losing Chess* (26pp, published as a self-standing pamphlet). An exposition based on definitive analysis by computer. It contains the following.
- A preliminary exposition of two-man pawnless endings, giving the general results and identifying exceptional cases. Thanks to the computer, this appears to be the first such exposition which has

been free from significant omission, though it normally gives only one example of each exceptional case (for example, “Qb1 v Bb8” stands for all the cases where the queen attacks the bishop and the bishop cannot move so as to sacrifice itself). Mentioned in passing are three cases where the board size may affect the result: Qg3 v Ka1 (won on the normal 8x8 board but lost on a 7x7), Be1 v Ne6 (lost on the 8x8 board but won on a 10x10 or larger), and K v N (won on boards up to and including 12x12 but only drawn on larger boards).

- A discussion of each three-man ending in turn, giving the general result (excluding cases where the player to move has to make an immediate capture or can win by making an immediate sacrifice), the nature and number of exceptions, strategical considerations, the longest wins for each side, the positions of reciprocal zugzwang (whoever is to move loses, or the side to move loses but his opponent to move can only draw), and any other features of interest. In the case of two knights against one, the list of reciprocal zugzwangs is restricted to positions where the player to move loses.
- A computer-generated statistical summary, giving the numbers of wins, draws, and losses, the lengths of the longest wins for each side, and the numbers of positions of reciprocal zugzwang.
- A list of reciprocal zugzwangs as actually generated by the computer, for use as a check in cases where the list in the body of the text has been edited for easier comprehension.

The document includes solutions to over fifty positions, mainly “longest wins” or other positions of particular interest, and the various positions credited here as “Beasley (discovered by computer)” come either from it or from a preliminary version which was circulating privately from January 1998.

(These expositions resulted from attempts to extract general rules from a mass of unstructured data, and two omissions should be noted. In K v QB, it is not made clear that the king’s only hope is to attack the queen at once, and the list of draws becomes much more comprehensible once this is realised. If the pressure is relaxed, the pieces have a certain win. In K v QN, attention should have been drawn to two important positions of domination with Nd5 against a king on the first rank: Qf6/Nd5 v Kd1 and Qa6/Nd5 v Kc1. In the latter, 1 Kb1 allows 1...Qa2 2 Kxa2 Nb4 with an exceptional win with N v K, an interesting counterpart to the win with Ne4 v Ka1 exploited in one of the Liardet 1997 studies in *Variant Chess* 26. A computer-based exposition is more reliable than a non-computer in its identification of exceptional cases, but it may not be so good at identifying logical connections between positions and where a competent pre-computer exposition exists it should always be studied as well.)

1999 Beasley, J. D. (discovered by computer). *Variant Chess* 32, summer 1999. Two studies.

- White Nc6/e4 (2), Black Kb1 (1), White to play and win. 1 Nd2 (1 Ne5 Ka1 and after 2...Ka2 bK will escape) Ka1 2 Nb3 (2 Nb1 loses) Kb1 3 Na1 (3 Nc1 loses) Kxa1 4 Nd4 and bK is dominated. The study “Nd4/Ne4 v Kb8” in the next item is an extended version of this: play 1 Nf6 Ka7 etc.
- White Bg2, Ng4 (2), Black Kb1 (1), White to play and win. 1 Bf1 (now the knight aims for e4 via f2, so...) Kc1 2 Ba6 (2 Bb5 Kb2 3 Nf2 Ka3) Kb1 (best) 3 Nf2 Kb2 (now White must wait again) 4 Bf1 Kb1/Ka2 5 Ne4 Ka1 6 Ba6 Ka2 7 Bb5 (7 Be2 also works) Kb1 (7...Ka1 8 Ba4) and now much as above: 8 Nd2 Ka1 9 Nb3 (9 Nb1 only draws) Kb1 10 Na1 (but this time 10 Nc1 is also good enough, since Bc4 will dominate Kc1) Kxa1 11 Ba4 and again bK is dominated.

1999 Beasley, J. D. *British Endgame Study News*, special number 18, xii.1999. “Paradoxical play in the Losing Game” (pp 2-3). A selection of studies showing paradoxical manoeuvres of various kinds: Nb5/Pd7 v Ka8 (Goldovski 1999), Nd4/Ne4 v Kb8 (the priority of Goldovski 1999 is acknowledged), Rb6/Pf7 v Pe2 (Liardet 1998), and Na4/Pg7/Ph7 v Rf1/Pd2 (Liardet 1998).

1999 Goldovski, S. *The Problemist*, iii.1999. White Nd4, Pd7 (2), Black Ka7 (1), White to play and win in 5. 1 Nb5 Ka8 2 Nc7 (2 Na7 only draws) Ka7 3 Na8 (3 Na6 Kxa6 4 d8R also wins, but not in 5) Kxa8 4 d8B and wB dominates bK. Although not formally published until 1999, this had been circulating privately since mid-1997, and it anticipates the discovery of similar knight manoeuvres by computer.

1999 Gruber, H. *Die Schwalbe*, xii.1999. Article “(Un)Vergängliche Schwalben” recapitulating various compositions published in *Die Schwalbe*, including a complete analysis of Kuhlmann 1980 (pp 304-6).

(1999) Liardet, F. Internet (copies of files forwarded to me). A large amount of material covering all aspects of the game, some of it certainly predating 1999. Endgame material is highlighted in the entries below.

(1999) Liardet, F. Internet (copy of file forwarded to me). Page “Points faibles” (Weak points): a discussion of three kinds of weak point and how to exploit them. All are relevant to endgame play, though only one is illustrated with an endgame example.

- “Le double contrôle” (Double guard). “When two (or more) opposing men guard the same square, you can threaten to play there. This is a winning threat if you have a clearance available after each of the two possible captures and the opponent cannot cover the critical square by a third man. This

combination often arises in the ending, as in the example below.” White Kb4, Pc2 (2), Black Ke6, Nf6 (2), win by 1 Kc4. This threatens 2 Kd5 followed by either 2...Kxd5 3 c4 or 2...Nxd5 3 c3, and it doesn't help Black to sacrifice on d5 first. Also highlighted is the “dangerous liaison” between two line-moving pieces. This is expounded in middle-game terms - “when two rooks are alone on the back rank, they doubly guard all the free squares on this rank” - but we have seen several endgame examples of it earlier in the present document.

- “La batterie” (possibly best rendered as “Discovered attack” since “battery” is a problemist's term in English). This arises when a line-moving piece is masked by one of its own men. “This situation is dangerous because any move by the masking man opens the line of the rear piece.” This is expounded in middle-game terms, the player trying to force the masking piece to move in order to set off a clearance, but again we have seen several endgame examples earlier in this document.
- “La pièce immobile” (Immobile man). “This doesn't mean a piece which has no moves, but rather a piece each of whose moves leads to a clearance.” The examples given are of middle-game situations (even the lightest, White Pa4/b2/c4 (3), Black Ke8, Nb8, Pd7/c6 (4), win by 1 a5 etc, shows the essentially middle-game tactic of advancing a pawn to disturb a piece which the opponent doesn't want to move), but many endings also revolve around the exploitation of such pieces.

My translations.

- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Les finales de ‘qui perd gagne’”. A general introductory page, leading into what follows.
- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Principes généraux sur les finales”. A general discussion, giving the general rule of strength (“grosso modo”) $R > K = Q = B > N > P$ (“in the ending, the pieces are generally free from obstacles and can exercise their intrinsic power”), and stressing (a) the basic principle of advancing the pawns as quickly as possible and (b) the importance of zugzwang particularly once the last pawn has promoted. “If in ordinary chess zugzwang is fairly rare, although being able to master it is essential, in Losing Chess endings it is the rule. It is nearly always impossible to proceed by direct attack (there are no weak points!) and to win it is necessary to drive the opponent to suicide.” A “particularly striking” example is given: White Kf1, Nc3 (2), Black Qh6 (1), whoever is to move loses.
- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Finales de deux pièces (sans pions)”. A comprehensive exposition of two-man pawnless endings, containing a general table of results, a complete list of exceptions, and a demonstration of the winning method with $N \text{ v } N$, $K \text{ v } N$, and $R \text{ v } K$.
- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Finales de trois pièces (sans pions)”. A comprehensive practical exposition of three-man pawnless endings, containing a general table of results and a more detailed discussion of particular cases. The ending $KN \text{ v } Q$ is described as “inclassable” (impossible to classify): “all results are possible, the draw being a little less frequent than the respective wins”.

The following endings are given a more detailed treatment.

- $2N \text{ v } N$. A general discussion, including the main line of Evseev 1992.
- $2N \text{ v } R$. “Even if there are exceptions, one can extract the general rule that to draw one of the knights must be within the region d3-e3-f4-f5-e6-d6-c5-c4-d3.” A position of reciprocal zugzwang ($Nb7/Nb4 \text{ v } Re1$) is given to demonstrate that the knights “may sometimes be able to regain the paradise lost” (White to play is soon boxed in, Black to play must relinquish the e-file and White then has enough space to draw). It is then remarked that when one of the knights is on a central square they can sometimes win: “the key position is that with the knights posted side by side on two adjacent central squares, when they win irrespective of the position of the rook.” There is a reference to a computer-generated study described below.

(There are indeed exceptions, and it ought perhaps to be stressed that one of the knights must *be* within the region. It isn't sufficient just to put a knight *into* the region, it must be able to maintain itself there. For an extreme example, consider $Nc7/Ne5 \text{ v } Rh2$. Here, one knight is not just within the region, it is on one of the four central squares, and even the other knight is away from the edge; yet $1...Rf2$ drives the central knight away, and Black will win ($2 Nc6 Rf3$ etc). There are also exceptions the other way, perhaps the most extreme being $Nd7/Nc8 \text{ v } Rg4$. White is very cramped and he will never be able to put a knight even temporarily into the region, but he can maintain one knight at d7 and move the other between c8 and a7, and Black will never be able to advance.)

- $KN/QN/RN/BN \text{ v } N$. “It is not surprising that these endings are generally won for White, the extra piece allowing the gaining of a tempo and the winning of the $N \text{ v } N$ duel. In the case of a line-moving piece, the simplest method is to attack the knight while the White knight is on a square of

the same colour, which results in transposition into a winning N v N ending. In the case of KN v N, the winning method is slightly different: it is better to leave the king alone and play as for N v N alone, the many waiting moves available to the king ensuring that White has the correct parity. In each case there are exceptions, where the Black knight can force the White accompanying piece to sacrifice itself while the White knight is on a square of the wrong colour.”

There follows a detailed and leisurely exposition of the study Nd7/Pe7 v Nh4 (*Variant Chess* 1997, see above), and then two exceptional drawing positions with BN v N and KN v N respectively: Bd8/Nf6 v Nd3 (play 1 Ne8 Nc5 2 Bf6 Nd3 3 Bd8 with a loss if either side deviates) and Kb8/Ng3 v Nc4 (play 1 Nh5 Ne5 2 Ka7 Nc4 3 Kb8 Ne5 similarly). There is also a reference to two computer-discovered studies which appear elsewhere in this document.

- KN v B. “This is one of the most interesting endings, because all results are possible. The logical result is a draw, but:

“1) The bishop wins if the knight is on a square of the same colour as the bishop. The knight always draws if it is at least two squares away from the edge and the king can join it, and also by a little touch of trickery exploiting the exceptional positions with knight against bishop.” Three illustrative examples are given, with full analysis: Kh4/Ne3 v Bc3 (Black to play wins, White to play would draw), Kb4/Ne3 v Bg3 (Black to play can only draw because wK can seek refuge on a6, and if ...Bc7? then Ka5 and Nf5 with an N v B win), Kf3/Nd2 v Bb2 (Black to play wins, being careful to keep wK away from h4).

“2) The king and knight can only hope to win if the knight succeeds in establishing itself on a square opposite to that of the bishop and within the region d2-e2-g4-g5-e7-d7-b5-b4-d2.” Example: Ke1/Nd2 v Bc8, White to play wins by 1 Kd1 (not 1 Ke2?? Bh3 and Black wins, nor 1 Kf2 Bd7 2 Ke3?? Bc6) Bd7 2 Kc2 2 Bc8/Be8 3 Kd3! Bd7 4 Kd4 Be8 5 Ke5. “Surprising as it might seem,” the position after 1 Kd1 is reciprocal zugzwang: White to play could not win (2 Kc2 Bd7 3 Kd3 Be8! and if 4 Ke4? then 4...Bh5 wins for Black, or 3 Kc3 Bg4! and draws).

“Exceptionally, the bishop can win if the knight is on a square of the right colour but very badly placed, as is shown by one of the exercises.” This position appears elsewhere in this document.

- KR v K and RN v K. “These endings are very similar. In general, they are drawn, but White wins when the Black king is penned against the edge of the board. In particular, White always wins with a knight on a central square. These wins, which are quite easy, are demonstrated in two exercises.” (These don’t appear as explicit exercises in the material seen by me, but only as the final stages of endings which start with other material: RN v K in the KP v P ending “d’après une partie Bartholdi-Goldowski”, and KR v K in the ending KRR v K. However, similar examples are well known: see Klüver 1923 for RN v K, and Klüver 1948 for KR v K.) “Here, let us simply show why it is impossible to win if the defending king is not on the edge.” Example: Kd4/Ra8 v Kg4. “1 Ra6 Kh5! 2 Ra3 Kh4 3 Ra8 Kg4 etc. The defence against rook and knight is exactly the same, again based on retreating moves which threaten the rook and force it to give way.”
- 2B v K. A brief description of the winning process, illustrated by the position requiring the longest sequence of moves.
- RB v K. A brief description of the winning process, with an illustrative example.

My translations.

- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Finales de quatre pièces”. An introduction to the various “four-piece ending” files of “Angrim” (see above, also Liardet’s notes below), together with a more detailed treatment of certain endings involving kings and rooks only. There is a warning that Angrim’s results assume the FICS rule that stalemate is a win for the player having the smaller number of men remaining on the board.

The following endings are examined in detail.

- 3K v R. This is a win (computer analysis by Laurent Bartholdi is credited). White’s aim is to reach a position of domination typified by Kf6/Kb4/Kd2 v Rh8, and in general he cannot be prevented from doing this. The general winning process is outlined with Ka2/Ka1/Kc1 v Rh4; for a more difficult example, see Liardet’s notes on Angrim’s four-piece build file. There is a warning that only a domination in the specified form will do; if White tries putting the kings in line, f6/d4/b2, 1...Rd8 or 1...Rh4 would win for Black.
- KRR v K. “A difficult ending; Stanislav Goldovski with the help of his *Giveaway Wizard* was the first to study it, and he found that the three pieces won except when the attacking king was pinned against the edge. The simplest winning method consists of two stages: to drive the opposing king to

a square one away from the edge, then to sacrifice one rook to force it to the edge with a winning KR v K ending.” Example: Kd2/Ra1/Rh1 v Kd5. “1 Rh8 (the rooks need the entire board to escape being harassed by the king: 1 Rh7 is met by 1...Kd6!) Ke5 (1...Kc5 2 Re1! is similar) 2 Rc1! (the key manoeuvre is to place the White rook on the file adjacent to his king and one or more rows in arrear; attacking wRh8 now serves no useful purpose, for example 2...Kf6 3 Ra8 or even 3 Ke3 Kg7?! 4 Kf4 Kxh8 5 Kg5 with a win, so Black must give ground) Kd6 (apparently forcing wR away, but ...) 3 Kc3! (White has already gained a rank, and he must now regroup his pieces and repeat the manoeuvre) Ke7 4 Rh2 Kd6 5 Ra1 Kc6 6 Kd3 Kd6 7 Rg2 (waiting for the king to choose his side) Ke6 (or 7...Kc6?! 8 Re2) 8 Rc2! Kf6 (now things become a little more complicated, because the turning manoeuvre 9 Kc4 Kf5! still leaves the king two squares from the edge, and a more subtle manoeuvre is needed to enable the White king to attain a central square) 9 Rb1 Ke6 10 Rb4! Kf6 (not 10...Kd7 11 Rc6 Kxc6 12 Rb5) 11 Rd4 Kg6 (11...Kf7 12 Ke4) 12 Re2! Kg7 (12...Kh5 13 Ke4!) 13 Ke4 Kf7 (the Black king is now one square away from the edge, and White can proceed to the second stage) 14 Rh2! Ke7 (14...Kg7 15 Rh8! Kxh8 16 Kf5) 15 Rd8! Kxd8 16 Kd5 (now the win is easy, for example 16...Ke8 17 Rc2 Kf8 18 Ke5 Ke8 19 Rc1 Kf8 20 Rd1 Kg8 21 Kf5 Kf8 22 Rd2 Kg8 23 Re2 Kh8 24 Kg5 Kg8 25 Re1 Kh8 26 Rf1 and wins).”

A drawing example is given as an exercise (see the page of exercises below). “When the White king is pinned against the edge by his colleague, Black can counter all attempts to escape, even though sometimes a certain precision is necessary.”

- KKR v K. “As in the ending KRR v R, the win is not obvious. This time, however, it is certain even when the kings are on the edge, always provided that the lone king cannot harass and win one of the opposing men.” Example: Kd1/Ke1/Ra8 v Ke4, an unfavourable position for White. “The general method will involve placing the rook behind the kings, which cannot be done at present; however, the kings, by using the whole width of the board, can succeed in getting away from the edge. 1 Kf1 (aiming for h2!) Kf4 (or 1...Kd4) 2 Kde1 Ke4 3 Kg1 Kf4 (Black must of course try and stay opposite the White kings) 4 Ra1 (simplest, though 4 Ra7 Ke4 5 Ra1 Kf4 6 Rd1 also works) Ke4 5 Kh2! Kd4 (the rook on the first rank prevents 5...Kd3 on account of 6 Ke2 Kxe2 7 Rf1) 6 Kg2 Ke5 (6...Kc4 7 Kef2 Kb3 8 Rh1) 7 Kd2 Kf5 (now White has gained a rank and can apply the systematic method, which involves placing the kings with one square separating them, and the rook behind them on the file adjacent to the king further from the side border) 8 Kf2 Ke5 9 Rc1! Kf5 (9...Kd6 would allow 10 Kc3! as we saw in the ending KRR v K) 10 Rc8 (the rook must play to c2 next move; 10 Kc3 Kg4 11 Ke1 would also work, but only the present manoeuvre can be repeated one or two ranks higher) Ke5 (the trap 10...Ke6!? threatening 11...Kd7! fails on account of 11 Rc4! Kd6 12 Rg4! Ke6 13 Kf3, and this defence will not be available one rank higher because the rook will have been able to play its waiting move while staying behind the kings) 11 Rc2! (the key move in this ending, found by ... *Giveaway Wizard!*) Kf5 12 Kc3! Kf6 (Black must yield a rank, since 13...Kg4 is impossible on account of 14 Kf3 Kxf3 15 Re2, but now it is necessary only to repeat the procedure to drive the Black king to the edge) 13 Ke3 Ke6 14 Ra2 Kd6 15 Rf2 Kc6 16 Rf1 Kd6 17 Rf3! Kc6 18 Kf4 Kc7 19 Kd4 Kd7 20 Rh3 Ke7 21 Rc3 Kf7 22 Rc1 Ke7 23 Rc4! Kf7 (other king moves leave him pinned against the edge straight away, 23...Kd8 24 Kc5 or 23...Kf8 24 Kf5) 24 Kc5 Ke8 (24...Kg7 25 Kd6 concedes still more quickly) 25 Ke5 Kd8 26 Rf4 (as in the ending KR v K, winning against a king on the edge presents no difficulty) Kc8 27 Ked5 Kd8 28 Rf1 Kc8 29 Re1 Kb8 30 Kb5 Kc8 31 Kdc5 Kb8 32 Rd1 Ka8 33 Kd6! followed by three sacrifices, but of course not 33 Ka5 Kb8 34 Kcb5?? Ka7!”
- 3K v K. “This ending is winning, as Joost Beltman was the first to remark. Let us start from a bad position for White (Ka2/Ka1/Kb1 v Kd4). 1 Kc1 (or 1 Ka3) Ke3! 2 Kcb2! Ke2 3 Kab3 (but not 3 Ka1b1?? Kd1!) Ke3 4 Kb4 Ke2 5 K2a3 (not 5 Kc5? Kd2!) Ke3 6 Kab2 (this V-formation is good for White; Black must go to one side or the other, allowing himself to be turned) Ke4 (6...Ke2 7 Kc5!) 7 Kc1! (this is the manoeuvre which forces Black to retreat; the White kings are just close enough to meet 6...Kd5 by 7 Kc4 Kxc4 8 Kb3 etc) Ke5 8 Kc2 Kf5 9 Kcc3 (9 Kc4? Ke6) Ke6 10 Kab3 Kf5 11 Kc5 Kf4 12 Kbb4 (the same position as after move 6, one rank and one column further advanced) Kf5 13 Kd2! Kf6 14 Kd3 Kg6 15 Kdd4 Kf7 16 Kbc4 Kg6 17 Kd6 Kg5 18 Kcc5 (again the same position) Kg4 19 Ke7! Kg3 20 Ke6 Kg2 21 Kee5 Kf1 22 Kee4 Ke1 23 Kcd5 (of course the three kings must never be placed in line: 23 Kcc4?? Kd2!) Kf1 (23 ...Kd1 24 K4c4 wins more quickly) 24 Kf4 Ke1 25 Kee5 Kd1 26 Kg3 Kc1 27 Kf3 Kb1 28 Kfe3 Ka2 29 Ked5 Ka3 30 Kc6! Ka2 31 Kcc5 Ka1 32 Kcc4 Kb1 33 Ke2 Ka1 34 Kd3 and the Black king, demonstrating a certain sense of humour, has chosen to be penned into the same corner from which the White kings started. An ending which is not too difficult, but which demands no little patience!”

My translations.

- (1999) Liardet, F. Internet (copy of file forwarded to me). Page “Finales avec des pions”. An introduction to the various “three-piece ending” and “four-piece ending” files of “Angrim” (see above, also Liardet’s notes below), together with a more detailed treatment of certain three-man endings with one White pawn. There is a warning that Angrim’s results assume the FICS rule that stalemate is a win for the player having the smaller number of men remaining on the board.

The following endings are examined in detail.

- KP v K.

“1) When the White king is not in the way and the pawn can reach a square two ranks ahead of the Black king, it draws by promoting to rook or king. But often the presence of the White king allows Black to gain one or two tempi.” Example: Kb7/Pd4 v Kb3. “Here, 1 d5 puts the pawn two squares ahead of the king, but it is not enough: 1...Kb4 2 d6 Ka5 3 Ka6 (or 3 Kc8 Ka6) Kxa6 4 d7 Kb7 and the pawn is caught. If the White king had been on b8, the position would have been drawn (the king would have been sacrificed on a7, permitting a promotion to king). On the other hand, if the White king had been on c6, Black would have won even wasting a tempo: 1 d5 Ka3! 2 d6 Ka4! 3 Kb5 Kxb5 4 d7 Kc6!

“2) Otherwise Black has an easy win, if necessary by manoeuvring around the pawn from the long side.” Example: Kc4/Pc2 v Kc7, Black to play. “The fact that the pawn still has the possibility of a two-step move does not prevent the win. 1...Kd7! (aiming for e2) 2 Kd4 Ke7 3 Ke4 Kf6 4 Kd3 Kf5 5 Kc3 (or 5 Kc4 Kf4 6 Kc5 Kf3 7 Kc4 Ke2 and wins) Kf4 6 Kc4 Kf3 7 Kc5 (or 7 Kc3 Kf2 8 Kc4 Ke2) Ke2 8 c4 Kf3 9 Kc6 Ke4 and the king will be able to sacrifice itself on d5.

“Note that a bishop or a knight is likewise useless when accompanying a pawn, and that the endings BP v K and NP v K are similarly won for the king unless the pawn is sufficiently far advanced.”

- RP v K. “A particularly common ending which it is essential to know.

“1) The king always wins if it can place itself in front of the pawn; whatever the position of the rook, the king also wins if it can reach the diagonal opposition with respect to the pawn.

“2) In general, the rook and pawn win if the king is penned two squares below the pawn.” Example: Ra3/Pf4 v Ke2. “1 Ra4! (the rook is awkwardly placed where it is, and this is the only good rank for it; for example, 1 Ra7? Kd3 2 f5 Kd4 3 f6 Kd5 4 f7 Kc6, or 1 Ra8? Kd3 2 f5 Kd4 3 f6 Kd5 4 f7 Kd6 5 Rh8 {5 f8R? Kd7 and it is Black who wins} Kd7 6 Rc8 Kxc8 7 f8K/B) Kd2 (if Black does not try to attack the rook, White can advance peacefully by 2 f5) 2 f5 Kd3 (2...Kc3 3 Rb4 followed by a rook promotion) 3 Ra1! Kc4 (after 3...Kc2 White has time for 4 Ra7 {4...Kb3 5 Ra2}) 4 f6 Kd5 (4...Kb5 5 Ra4) 5 f7 Ke5 6 Ra2! and after this waiting move Black is forced to allow a rook or bishop promotion (we recall that the ending RB v K is winning).

“3) The rook also wins if it can cut the king off from the pawn by occupying the file adjacent to the pawn, unless the king is three ranks ahead of the pawn.” However, there is a drawing case where the king gets two ranks *behind* the pawn, drives the rook off the file, and then goes forward, and I understand that the text here has now been changed. Set Ra1/Pd3 v Kg5 and White appears to have a win by 1 Re1 Kg6 2 d4 Kg7 3 d5 Kg8 4 d6 Kh7 5 d7 Kg7 6 Re2 followed by promotion to R or B, but if Black plays 1...Kg4! 2 d4 Kg3! (threat 3...Kf2 drawing) 3 Re6/7/8 Kf2!! as in Hofmann 1956 he can hold the draw. Set everything one rank higher, Ra2/Pd4 v Kg6, and White does win.

- RP v P. “In general, White wins by placing the pawn on a square of the opposite colour to Black’s promotion square. There is now always a square which the rook can occupy to prevent a promotion to rook or bishop, thus forcing Black to promote to king. If the king cannot catch the pawn, White wins.” There follows a leisurely and detailed analysis of the ending Re6/Ph4 v Pf4 from the 1998 Geneva meeting (see Liardet 1998, *Eteroscacco* 84), plus a reference to two more difficult positions illustrated as exercises (Liardet 1998, *Variant Chess* 30).

My translations.

- (1999) Liardet, F. Internet (copies of files forwarded to me). Pages “Exercices didactiques”, “Etudes de mon cru”, “Etudes d’autres compositeurs”, and “Positions trouvées par ordinateur”. Four pages of endgame exercises and studies, including several not noted elsewhere in this document.

- “D’après une partie Bartholdi-Goldowski, 1997”: White Ke5, Pb7 (2), Black Ph3 (1), White to play and win. The material seen by me does not include the solution, but *Giveaway Wizard* plays 1 b8R (simplest, though 1 b8Q and 1 Kf4 also win) h2 2 Rf8 h1K (other moves lose at once) 3 Ke4 Kh2 4 Rf4 Kh1 5 Rf3 with two sacrifices to follow.
- “John Beasley et *Losing3*”: White Bd2 (1), Black Ke7, Na8 (2), White to play and win. There is no play in the material seen by me, but a typical solution goes 1 Bc3 Kd7 2 Ba1 Kc6 3 Bb2 Kb5 4 Bf6

Ka6 5 Be7 Ka7 6 Bc5 with a striking final position (6...Nc7 7 BxK will be a win for the bishop). Several other waiting moves are as good as moves 2 and 3.

- “D’après une partie *Wizard*-Liardet, 1998”: White Kd2, Pb4 (2), Black Bd5 (1), Black to play and win. “With White to play the win would be easy, 1 Kd1 (like 1 Kc1) losing against 1...Bb3! 2 b5 Bxd1 3 b6 Bg4 and 1 Ke1 being even quicker. But the bishop cannot lose a move while remaining on the long diagonal (where he prevents the pawn from advancing): 1...Bb7 2 Kd1 Ba8 3 Kc2! and there is nothing better than 3...Bd5 4 Kd2 returning to the initial position. The solution is 1...Bb3! 2 Ke3 Be6! and White is in zugzwang: 3 b5 Bd5 winning at once, or 3 Kf2 Bd5 4 Ke1 Be4, or 3 Ke2 Bg4! 4 b5 Bxe2 5 b6 Bg4, or 3 Kd2 Bd5 and the bishop has successfully triangulated, returning to the initial position with Black to move.” My translation.
- “Exercice inédit”: White Ka3, Ra8/h7 (3), Black Kd4 (1), Black to play and draw. Again the material seen by me does not include the solution, but the discussion of KRR v K above suggests that it should go 1...Kd3 (1...Kd5 2 Rh2 Kd4 3 Ra2 with the winning manoeuvre seen previously, or 2...Kc6 3 Rag8! with Ra2 to follow) 2 Ka4 Kd4 3 Rh1 Kd5 (3...Kd3 4 Ra5 and again as previously) 4 Rg1 Kd4 and wK will never get away from the edge; if 5 Ra1?? hoping to meet...Kd5 with Ra3 and ...Kd3 with Ra5 then 5...Kc4! and Black will win.
- “Inédit d’après Stanislav Goldovski” (see Goldovski 1999): White Nd4, Pd7/c4 (3), Black Ka7 (1), White to play and draw. An example of perpetual check in Losing Chess: 1 Nb5 Ka8 2 Nc7 Ka7 3 Nb5! If is easy to see that all the moves are forced; for example, 3 Na8? Kxa8 4 d8B Kb8 5 Bf6 Kb7 followed by 6...Ka6 and 7...Kb5.
- “John Beasley et *Losing3*”: White Nh2 (1), Black Qb8/Nd6 (2), White to play and win. As long as the Black knight cannot move, White will win if he can force the Black queen to sacrifice itself on a light square, Black will win if he can sacrifice it on a dark. 1 Ng4 (only move: 1 Nf3/Nf1 Qa8 2 Nh2 Qa2 3 N-- Qh2 and wins the N v N ending, and similarly after other second wN moves) and now every bQ move can be met: 1...Qb7/Qb1 2 Nf2 with an attack on the doubly guarded square e4, 1...Qa8 2 Nf6 with a similar attack on two doubly guarded squares, 1...Qc8 2 Ne3, 1...Qg8 2 Ne5, and 1...Qb4! 2 Nf2 Nc4 (meeting the threat of Ne4, but ...) 3 Ne4 and again a bQ sacrifice will lead to a N v N win for White.
- “Ben Nye et *ACSP*”: White Kd5, Rd6 (2), Black Rd1, Nd3 (2), White to play and win. “At present only the rooks can move, but they must be careful to choose the correct squares! 1 Rd7! (the rook must take two moves to get to d8, because the position after the first move is a draw-loss reciprocal zugzwang, Black to play loses but White to play cannot win) Rd2 2 Rd8 Rd1 3 Kd6 Rd2 4 Kd7 Rd1 5 Re8! (or 5 Rc8) and White wins (5...Re1 6 Rxe1 Nxe1 and White has K v N). In contrast, 1 Rd8? Rd2 2 Kd6 (2 Rd6 is met by 2...Ne5) Rd1 3 Kd7 (3 Re8? Nc5) Rd2 4 Rf8? (4 Kd6 draw) Nf2 5 Rxf2 Rxf2 and it is Black who wins.” My translation.
- “Ben Nye et *ACSP*”: White Nc2/d1 (2), Black Qb7, Bb5 (2), White to play and win. “1 Na1 Qb8 (the only moves for each side) 2 Nb3! (avoiding the repetition by 2 Nc2?! even though at first sight it might seem wise to settle for a draw) Qb7 3 Nb2 Qb8 (of course Black cannot sacrifice the bishop, but now comes the true point of the study) 4 Na4! Bxa4 5 Nc1!” My translation.
- “Ben Nye et *ACSP*”: White Nd2/e1/h1 (3), Black Bc8 (1), White to play and draw. There is no solution in the material seen by me, but *Giveaway Wizard* plays 1 Nd3 Bd7 (else Black loses) 2 Nf3 with a fortress; not 1 Nc4 Bd7! 2 Nf3 Bf5 3 Na5 Be6 4 Nc6/Nb7 Bd5 and Black will win. The point is that with the knights on d3/f3/h1 and no knight under attack, the Nf3 always has a safe move (Ng1 against bBh3, Nfe1 against bB elsewhere), while an attack on any knight loses because White can sacrifice two knights and obtain an N v B win. But with wNc4 instead of d3, Bf5 leaves wNf3 with no safe move; only Na5 avoids immediate loss, and Be6 prevents any return to c4. See also “Bb1 v Nc4/Ne2/Ng1” in the next entry.

(1999) Liardet, F. Internet (copy of file forwarded to me). Notes inserted into Angrim’s file of build notes on his four-man database (see above). The added notes highlight particular positions, giving the essentials of the play and commenting on features of special interest.

- Nd3/Nb1 v Kh3/Kh2 (given as “win, 14 ply” by Angrim): “Two knights cannot beat two kings without some miracle.” 1 Nd2 and either (a) 1...Kh1 2 Ne4! Kg3 3 Nxc3 and the remaining bK has only bad moves, or (b) 1...Kh4 2 Ne5! (“same trick one rank higher”) Kg4 3 Nxc4 Kh1 4 Nf2! (“again!”) Kh2 5 Nh1! Kxh1 6 Ne4 with a standard N v K win.
- Kc1/Ra3 v Qh4/Re4 (win, 8 ply): 1 Ra1! Rf4/Rg4 2 Rb1!
- Ne5/Nb2 v Kg7/Qh8 (win, 30 ply): “This one is long indeed! The manoeuvre by the white knights seems to be unique (apart from possible repetitions).” 1 Nec4! “or of course the symmetrical

1 Ned3.” Kf6 2 Ne3! Qf8! “2...Kg7? would lose immediately to 3 Nd3.” 3 Nbd1! “This knight is heading for g3.” Kf7 4 Ng2! “And this one for e2.” Kf6 5 Nf2! Kf7! “Better than 5...Qf7 6 Ne1! Qf8 7 Nf3 Kf7 8 Nd4 and wins.” 6 Nf4! “Now 6 Ne1? failed to 6...Qb8!” Kf6 7 Ne2! Qf7! “This time not 7...Kf7 8 Nd4!” 8 Nh1! Qf8 9 Ng3 Kf7 10 Nc1! “This knight must move to prepare the final combination, but c1 is its only square: 10 Nc3? Qe8! or 10 Ng1? Qd8!” Kf6 11 Nf5! Kxf5 12 Ne2! Kf6 13 Ng3 Kf7 14 Nh5! “and wins!”

- Na1/Rb1 v Bh2/Ng4 (draw): “1 Nb3 Nf2! 2 Rh1 Nxb1 3 Nc5 leads to an unusual N v BN draw.” Play might continue 3...Bf4 (all other bB moves allow a winning wN reply, forcing bB to sacrifice itself after which White will win with N v N) 4 Nb3 Bb8 5 Nc1 (the attempt to repeat by 5 Nc5 fails against 5...Nh2 6 Nda6 Ng3) Bf4 (again Black’s only move) 6 Nb3 Bg3 7 Nc1 Bf4 8 Nb3 and Black has no options left.
- Kc1 v Re5/Ba3/Pf6 (win, 42 ply): “If I understand this one well, the plan is to bring the king to h4, which Black can prevent for quite a long time.”
- Ka1 v Pf3/Pe2/Pf2 (draw): “Precision seems to be required by White to stop Black from promoting all three pawns and reaching a winning 3 pieces v king ending.” 1 Kb1? f1N 2 Kb2 f2! leads to zugzwang; Black to play would lose immediately (3...e1K 4 Kc3), but White to play loses after either 3 Kb1 Nd2! 4 Ka1 Nb3 5 Kb1 Na1 6 Kxa1 e1B or 3 Ka2 Nh2! 4 Kb1 Nf3 5 Kb2 f1B “soon followed by promotion of the last pawn”. So White must play 1 Kb2! f1N 2 Kb1 Nd2 “Now this is the only move, as 2...f2 loses to 3 Kb2! and 2...e1K/B to 3 Kc1!” 3 Ka1 Ne4 “3...Nb3 4 Kb1 Na1? 5 Kxa1 e1B 6 Kb2 now leads to defeat.” 4 Kb1 f2 “Promotions are still impossible, and 4...Nd2 only repeats.” 5 Kb2! Nc3 6 Kxc3 e1R “This would win if the pawn was still on f3, but with the pawn on f2 White has an unexpected resource.” 7 Kd4! Rb1 8 Kd3! Ra1 “Black can’t promote: 8...e1R? 9 Kd2!” 9 Kd2 Rcl 10 Kxc1 e1K/B draw.
- Bb1 v Nc4/Ne2/Ng1 (draw): “The B v NNN ending is normally won for the bishop. The winning plan is to attack one of the knights while the two others lie on squares of the same colour, thus unable to sacrifice themselves on the next two moves. Some positions exist where the bishop loses, either by being immediately dominated by the knights, either in a more subtle way ...” Then follows the diagram. “But how can this ending be drawn? Only by making use of the two exceptional wins with N v B. In this position, after any move by White, say 1 Bf5, Black can answer 1...Nf3!! and set up a fortress, because Black can attack neither of the knights without running into an N v B win” (an attack on bNc4 is met by 2...Ng3! 3 Bxc4 Nf1 4 Bxf1 Nh2, an attack on bNf3 by 2...Nc3! 3 Bxf3 Nd1 4 Bxd1 Nd6, and the bishop cannot attack bNe2 without simultaneously attacking one of the other knights). Moreover, the bishop is unable to dominate all the knights, hence “nothing can stop Black from moving back and forth to his ‘fortress’ position.”
Liardet comments that subsequent computer analysis by Ben Nye (“Angrim”) has shown that there are precisely six such fortress positions for the knights: the one used here, and Nd3/Nf3/Nxx where xx runs through the five squares f5/e4/e2/f1/h1. See also “Positions trouvées par ordinateur” above, “where you will find out why Nc4, Nf3, Nh1 is *not* a fortress”.
- Nc6/Nc2/Nb1 v Bh3 (win, 12 ply): “No hope to dominate immediately the bishop, but sometimes this can be done with only one or two knights...” 1 Nc3! “Everything else loses.” Bc8 “The only square.” 2 Na7! “Otherwise Black would win by attacking Nc6.” Now Liardet gives 2...B-- “(except f5)” 3 Nc8 Bxc8 4 Ne1 and 2...Bf5 3 Nab5 Bxc2 4 Nd1 Bxd1 5 Nd6, but in fact 3 Nc8 works even against 2...Bf5; the knight is again within range of d6 ready to deal with 3...Bxc2 etc, and the capture 3...Bxc8 leads back into the first line.
- Bd2 v Rd7/Nf6/Ng3 (win, 24 ply): “White wins by a superb triangulation”. 1 Bc1 “Only.” Rf7 “1...Rc7? 2 Be3 is simple.” 2 Be3! Rf8 3 Bd2! “The trap 3 Bc5? Nf5! 4 Bxf8 Nh6 5 Bxh6 Ng8 was to be avoided.” Rf7 “3...Rd8? 4 Bh6.” 4 Bc1! Rf8 5 Be3! Re8 “This time the rook is forced to attack the bishop.” 6 Bh6! and wins. “Unfortunately, (aesthetically speaking), there is another way win at move 3 by 3 Bg1 Rg8 4 Bc5 Rg6 5 Ba3 Rh6 6 Bf8!”
- Qa3/Nf3/Nb2 v Bh3 (win, 14 ply) and Qb1/Na1/Nd1 v Bh2 (draw): “These positions are worth a good look.”
- Rb7/Nd5/Pe6 v Bh5 (win, 28 ply): “This one uses a nice win with KN v B”. The main variation is 1 e7 Bg6! “All others lose directly or lead to Ne3 v Be8.” 2 Nb6! Bb1! 3 Nc4! Bh7 4 Rc7 Bb1 5 Rc8! Bc2 6 e8K! Bb1 7 Rb8! B-- 8 Rb1 Bxb1 9 Nb6! Bh7 “Only square.” 10 Ke7! Bb1 11 Kf8! and wins.
- Rb1/Na1/Pf2 v Ba3 (draw): “Draw under FICS rules only.” (Under international rules, 1 Rb2 Bxb2 2 f4 Bxa1 3 f5 wins.)

- Ka1/Kb1/Bc1 v Nc5 (draw): “A draw is of course a most surprising result with this material.” Black has two threats, of which the more dangerous is 1...Na4. 1 Be3! is “the only way to parry it”, and now 1...Na4 2 Bb6 and 1...Nd3 2 Bf4 “both allow the kings to come out, losing quickly.” Hence 1...Nb7! “But not 1...Na6? 2 Bg5! Nc5 3 Bd8! and White wins!” 2 Bh6 “Or 2 Bc1” Nc5 “and White must repeat by 3 Be3.”
 - Nc1 v Ka8/Kf5/Nf7 (win, 22 ply) and Na1 v Kc5/Kg1/Na2 (draw): “Both these positions quickly transpose into N v KN.” (In the first, 1 Nd3 forces 1...Kf4; in the second, 1 Nc2 forces 1...Kd4.)
 - Ka1/Kb1/Pb2 v Nf4 (draw): “FICS draw; under usual rules, 1 b4 is a win for White.”
 - Na1 v Ke4/Bg2/Bh1 (win, 14 ply): “The reader may have fun discovering why the knight must go through b8 or a7...” *Giveaway Wizard* duly plays 1 Nb3 Kf5 2 Na5 Ke4 3 Nc6 Kf3 4 Nb8 allowing the bishops no move, whereas if 4 Nd8 then 4...Bf1 frees Black’s position.
 - Kc2/Ba6/Bb5 v Nh2 (draw): “A simple but humorous repetition (1 Kd3 Ng4 2 Kc2 Nh2...)”
 - Rb2/Ba1/Bb1 v Ng7 (draw): “Simple but funny.” 1 Rc2 Nh5! 2 Rb2 Ng7! 3 Rc2 etc.
 - Na1 v Rg6/Rg5/Bg3 (draw): 1 Nc2 Bc7 “Or 1...Bb8, but not 1...Be1? 2 Nxe1.” 2 Ne1! “and the black bishop is forced to cut off the rooks from the g2 square, with move repetition to follow” (2...Bg3 3 Nc2 Bc7 etc).
 - Na1 v Rf3/Rg3/Nd3 (draw): “Similar to the BRR v N draws: 1 Nb3 Nf4! 2 Na1 Nd3 etc.”
 - Rd1 v Ka8/Kf8/Kb3 (win, 58 ply): “This ending is a win for the kings if they can regroup, it is a draw if the rook manages to capture a king and a loss if like here the rook manages to capture two of them. White must play precisely to get the right tempo in the reciprocal Zugzwang positions of this ending.” 1 Rd6! “Threatening 2 Ra6!, therefore Black must get both queenside kings on the same file. Not 1 Rd5? Kb8! with a position of reciprocal Zugzwang: there follows 2 Rd1!? Ka4! 3 Rd6 Kb4! after which the kings regroup.” 1...Ka4! “If 1...Kb8 2 Rd5!, e.g. 2...Kb2 3 Rd4 Kb1 4 Rd3 Kg8 5 Re3 Kh8 6 Rf3 Kc7 7 Rf7!” 2 Rh6! “Not 2 Rc6? Ke8! with another reciprocal Zugzwang.” 2...Ke8 3 Rc6! “and White wins, e.g. 3...Kf8 4 Rd6 Ka3 5 Rd5 Kg8 6 Re5 Ka2 7 Re4 Kh8 8 Rf4 Ka1 9 Rf3 Kb8 10 Rb3!”
 - Kf6/Kb4/Kd2 v Rh8 (target position for 3K v R): “When the kings stay close enough together there is nothing the rook can do to stop them from reaching this position or a similar one. The database for this ending had already been constructed by Laurent Bartholdi back in 1998.”
 - Rb1 v Kd7/Kf3/Rf7 (win, 44 ply): “Again a nice triangulation is required from the white rook”. 1 Ra1 Kf4 “Not 1...Kc7? 2 Rh1! Black must keep at least one of the kings one or two squares close to the rook. On the other hand, 1...Ke7?! would lose quickly to 2 Rc1! Kf4 3 Rc2 Kf5 4 Rc3 Kf6 5 Rc4 and Black is without moves.” 2 Ra2! Kf5 3 Ra3 Kc7! 4 Ra1! “4 Ra2?! would only repeat.” Kd7 “Once again, better than 4...Kf6?! 5 Ra4 etc.” 5 Rb1 Kf4 6 Rb2 “and White has managed his tempo loss”: Kf5 7 Rb3 Kf6 8 Rb4 Ke7 9 Rc4 and wins.
 - Ra1 v Kc3/Be5/Pd6 (draw): “Black would be expected to lose, but he can build a fortress”. 1 Ra7 Bf4 2 Ra8 “2 Ra1 Be5 of course” Kd2! and “the king will oscillate between d2 and e2 with the rook unable to approach.”
- (1999) Liardet, F. Internet (copy of file forwarded to me). Notes inserted into Angrim’s list of non-trivial three-man positions of loss-loss reciprocal zugzwang (see above). Some notes merely highlight particular positions without further comment, and the comments on these are my own responsibility.
- Nc7 v Kc3/Pf6 (given as “loss in 28/20” by Angrim). If White does nothing, Black will win by promoting to a second bK, but if White can capture bK with sufficient care he may be able to win with N v fP. However, after 1 Na6 we have 1...Kd3! (another reciprocal zugzwang) 2 Nc7 (2 Nb8 is no better) Ke3 and wN must retreat. Black to play, 1...Kd3 2 Na6 Ke3 3 Nc5 Kf2 4 Nd3 and wins bK, with a standard N v fP win to follow.
 - Nd4 v Rd7/Pd6 (loss in 22/16). White can hope to capture bR and then win with N v dP, for example (Black to play) 1...d5 2 Ne6 Rd8 3 Nxd8 etc, or 1...Rd8 2 Ne6 Rf8 3 Nxf8 and 4-7 Ne1. With White to play, the parity is different, and a rook sacrifice will leave bP able to promote to knight before wN can get back to stop him; so White cannot usefully attack, and he will succumb to Black’s eventual promotion. For example, 1 Nf3 d5 2 Nd2 (2 Ne5 Rf7!) d4 3 Nf1 (3 Ne4 Rd6!) d3 4 Ng3 (4 Ne3 Rd5!) d2 5 Nh1 (5 Ne2 Rd4!) d1R and both rooks will go.
 - Qc1 v Pf7/Pf3 (loss in 6/8). White to play is dominated; Black to play, 1...f5 2 Qa1! f4 3 Qb1 (say) and a sacrifice next move.
 - Pc7 v Rc2/Nc4 (loss in 26/14): “Nice one. Black is ready to answer 1 c8K by 1...Rf2 2 Kd8 Rf6

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3 Kc8 Re6 etc and 1 c8B by 1...Nd2! dominating the bishop (but not 1...Nb2? 2 Be6!). But why can't Black at move play 1...Rc1? Because of 2 c8B Nd2 3 Bh3! (or even 3 Ba6!)."

(1999) Liardet, F. Internet (copy of file forwarded to me). Notes inserted into Angrim's list of four-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving neither knights nor pawns. One note merely highlights a particular position without further comment, and the comment on this is my own responsibility.

- Kd4/Qd1 v Rd7/Bd6 (given as "loss in 36/8" by Angrim): "Each side seems to have one safe move, but this is not the case. 1 Kd3 fails to 1...Rh7!, while 1...Rd8 fails to 2 Qd3!"
- Kd3 v Qh3/Be8/Bg3 (loss in 36/8): "Again an illusory safe move. While it is not surprising that White at move will lose after 1 Kc3 Bc6, why couldn't Black at move play 1...Bd7? Because of 2 Kd4!"
- Kd3 v Qc8/Be8/Bc7 (loss in 22/8): "Same story..."
- Rc3 v Ka5/Ka1/Ke1 (loss in 38/54): "Clearly, White at move would have to allow the kings to regroup, after which Black wins as is normally the case with three kings against a rook. But if Black is to move the kings get quartered." 1...Ka6 2 Rc4 Kf1 "Ka1 can never move, because it would allow the rook to attack him: 2...Kb1 3 Rb4! or 2...Ka2 3 Rc2! with transposition into a rook versus king ending. So Black can do nothing better than move his kings into the corners." 3 Rd4 Ka7 4 Rd5 Kg1 5 Re5 Ka8 6 Re6 Kh1 7 Rf6 and now a Black king must move to his detriment.
- Ra1 v Kd8/Ke4/Re8 (loss in 12/14). Black to move, 1...Ke3 2 Rb1 Ke4 3 Rb2 and Black will be gradually forced back, or 1...Kc8 2 Ra2 and the same; White to play, 1 Ra2 Kc8 or 1 Rb1 Ke3, and this time it is White who is forced back.

(1999) Liardet, F. Internet (copy of file forwarded to me). Notes inserted into Angrim's list four-man positions of loss-loss reciprocal zugzwang (whoever is to move loses) involving precisely one knight or pawn. Some notes merely highlight particular positions without further comment, and the comments on these are my own responsibility.

- Kb1/Ba3 v Rh1/Nd1 (given as "loss in 6/12" by Angrim): "White to play clearly loses, because 1 Ka1 allows 1...Nb2. But doesn't Black to play have one safe move? Let's see: 1...Rg1 2 Bc5!! One of the most amazing moves I have ever seen! 2...Nb2 The other knight moves keep the White king under attack. 3 Bxg1 and the knight has no way to stay close to the king!"
- Kd3/Bb1 v Rf5/Pe6 (loss in 10/16): "This one is worth a look."
- Kb1/Ng2 v Kc4/Qc8 (loss in 32/18): "It looks like this material often leads to interesting play. The example reminds the longest win shown in the four-piece document." White to play, 1 Kc1 ("1 Ka1 is clearly worse, for instance 1...Qf8") Qh8! forcing 2 Nh4 Qxh4 "after which Black's win, though long, is purely technical, e.g. 3 Kd1 Qh8 4 Ke1 Kd4 5 Kd1 Qf8 6 Kc1 Qe8 etc." Black to play has to concede ground, "and that is enough for White to win, as exemplified by the toughest defence" 1...Qd8! 2 Ne1! Kd5! 3 Kb2 Qd7 4 Nc2 Kd6 5 Kc3 Qd8 6 Ne3 Kd7 7 Kd4. "Other defences like 1...Kc5 2 Kc2 lead to similar play."
- Kd2/Nb2 v Rg5/Bh6 (loss in 34/8): "We will not detail how Black would win in such a position if he could just untangle his pieces, but just why the white king has to be on d2 rather than on c1 or e3: to answer 1...Bf8 by 2 Na4!" (1 Ke3 Bf8 2 Na4 Bc5 3 Nxc5 Rxc5 is easy, but the corresponding line 1 Kc1 Bf8 2 Na4 Rc5 3 Nxc5 Bxc5 is only a draw and instead Black must play 2...Re5.)
- Kd3/Nf8 v Rb5/Ba6 (loss in 26/6): "Funny one too. No good move for the knight."
- Kc1/Nb8 v Qg3/Rf4 (loss in 18/10): "1 Kb1 Qh3!; 1...Qh4 2 Na6! 1...Qg5 2 Kd2! Qh4 3 Kd3."
- Kd4/Na1 v Qh8/Rf6 (loss in 40/12): "Let us assume that Black will win if he manages to untangle his pieces, then this is the case after 1 Kc3 Qh5 or 1 Kd3 Qf8 and White can't capitalize on the doubling on the f-file (2 Ke4 Rf4 or 2 Ke2 Rf1). White's other moves lose outright: 1 Nc2 Qh6!, 1 Ke3/Ke4 Rf3." Black to play, 1...Qg7 2 Kc3! "Possible because Black lost access to the squares e8 and h5" Qh8 3 Nc2 "White now threatens an immediate win by 4 Nd4!" Qh5 4 Ne1! and 5 Nf3.
- Kd1/Ne1 v Qh8/Qb6 (loss in 6/12): "1...Qb8 2 Ke2! immediately dominates both queens, but after 1...Qa7 White has to choose the right way to take one queen: not 2 Nc2? Qa3 3 Nxa3 Qf6! but 2 Ng2! with two similar lines 2...Qh4 3 Nxh4 Qb8 4 Kd2 or 2...Qe3 3 Nxe3 Qb8 4 Kd2."
- Kd2/Rh2 v Ba2/Nd6 (loss in 12/20): "Black's win after 1 Ke2 is quite elegant." (Play continues 1...Nc4 2 Kf2 Ne5 3 Kg2 Nd3 and White has no good move.)
- Kd4/Qd1 v Bd6/Nd7 (loss in 14/6): "Every move loses immediately here, except 1 Kd3 which

requires great precision by Black.” There follows 1...Bb8! “Not 1...Nf8? 2 Qb1!, 1...Nb8? 2 Qf1!, 1...Bc7? 2 Qb1!, neither 1...Bf8? 2 Qc2! After the text move White can’t similarly play 2 Qe2 because of 2...Bh2! (that is the reason for an asymmetrical solution)” 2 Kd2 Nf8! “Still not 2...Bc7? 3 Qb1!” 3 Kd3 Ne6 “Changing the move order by 3...Bc7 works too.” 4 Kd2 Bc7! “Of course not 4...Bd6? 5 Qc2!” and White is finally left without moves.

- Rd1/Bd2 v Re7/Nd8 (loss in 8/16): “Same idea as the next one.”
- Rc1/Bc3 v Re4/Nc7 (loss in 8/14): “The black rook has to be on the e-file to answer 1 Re1 by 1...Rxe1 2 Bxe1 Ne6!, and ...has to be on the fourth rank to answer moves like 1 Rh1 by 1...Rh4 2 Rxh4 Na6! Black to move loses after 1...Re5 2 Bxe5 Na8 3 Bc3!, 1...Re8 2 Rh1! or 1...Re6 2 Rf1!”
- Eight positions, Ba8/Pa7 v Qh6/Rc1 or Qc1/Rh6 (2) and Bb8/Pb7 v Qg6/Rd3, Qh5/Re2, Qe2/Rh5, Qa1/Ra5, Qe1/Rg6, or Qe1/Re3 (6): “All these positions are of the same type.” For the solution to the first of them, see “Angrim” above.
- Bd2 v Rd8/Rd7/Pd5 (loss in 12/4): “A typical line with White to move is 1 Be1 Re7! 2 Bd2 Re3 3 Bxe3 Re8!”
- Nd3 v Kh4/Rg7/Bh8 (loss in 14/8): “1...Kh3 2 Ne1!; 1...Kh5 2 Nf2! Kg6 3 Nh3.”
- Rd1 v Ka4/Kb3/Na5 (loss in 24/10): “It is very surprising that Black can’t find any good move here: 1...Kab4 2 Rd3!, 1...Kaa3 2 Rb1!, 1...Kb5 2 Rd4!, 1...Kbb4 2 Rb1! and finally 1...Kba3 2 Rd6! The three following positions are similar.” These are Rd1 v Kb4/Ka3/Na5 and the same pair of positions two ranks up. But why precisely two ranks up? Try three ranks up, Rd4 v Kb7/Ka6/Na8, and Black can play to the a-file by 1...Kba7 since the reply 2 Rd9 is unavailable; try one rank up, Rd2 v Kb5/Ka4/Na6, and Black can again play to the a-file, 1...Kba5, since 2 Rd7 can be met by 2...Nb8!
- Rc8 v Ka6/Ka2/Pa5 (loss in 38/16): “Black to move: 1...Ka3 2 Rc1 a4! 3 Rc8 Ka5 4 Rc4! or 3...Ka2 4 Rb8!”

(1999) Nagorko, A. Internet. White Bc7/e5/g2, Nc6, Pb6/b4/c3 (7), Black Bg5/g1, Pf2 (3), White to play and win. 1 Bf6 Bxf6 2 Nb8 Bxc3 3 Ba8! Bxb4 4 Bd6 (4 Bh2 also works) Bxd6 5 b7 Bxb8 and stalemate. The purpose of bBg1/bPf2 is unclear, particularly as without them there would be no dual at move 4.

(Surprisingly, the win by stalemate against a bishop of the opposite colour seems to have inspired only three compositions, Dawson 1924, Dittmann 1987, and this one, and even Dittmann 1987 relies on “Win in n moves” to force the stalemate. While I was writing this document, the following curious position occurred to me: White Kb8, Pa7/b7/b6 (4), Black Be5 (1), win only by 1 a8B, winning against a lone bishop by *promoting* to a bishop of the opposite colour!)

“1999” Anybody carrying this survey forward is asked to note that issue 34 of *Variant Chess*, although nominally dated “Winter 1999”, did not appear until early in 2000, and that material from it has not been included here.

Definitive analyses by computer

It is not clear to what extent these have been formally published, but their existence is known and I think they should be included.

- 1992 Evseev, G. Two knights against one. Data not made generally available so far as I know, but one position reported in the literature (see Evseev 1992 and Evseev and Poisson 1993 above).
- 1998 Beasley, J. D. All three-man pawnless endings. Data made available on disc, with an interrogation program; results for two knights against one confirm published details regarding Evseev 1992. Described in *Three-man pawnless endings in Losing Chess* (see Beasley 1999).
- 1998 Bartholdi, L. All three-man endings with or without pawns, calculated both assuming stalemate to be a win and assuming it to be a draw. The database is part of the Losing Chess playing program *Iznogoud*, but there is no separate interrogation program.
- 1998 Bartholdi, L. Three kings against rook. Data not made generally available so far as I know.
- 1999 “Angrim” (Ben Nye). All four-man endings, with and without pawns. The data were created for use with the Losing Chess playing program *ASCP*, and so far as I know only summaries and selected positions are as yet generally available. Moves are counted to end of game, and the FICS stalemate rule (stalemate is a win for the player with the smaller number of men) is assumed.

Index of positions with up to five men

Because some material combinations have been explored in several studies, sometimes with colours reversed, I have ignored colour and have always put the side with the smaller number of men first. I have indexed initial positions comprehensively but have been more selective with positions occurring in play, generally including the latter only when they appear to be significant. Multiple items within a year are indexed as /1, /2, etc, and bullets within an item as a, b, c. It should be stressed that in some cases the author cited is an editor or compiler and not the originator of the material.

Two men

Many two-man endings are straightforward, and most articles cover a range of cases. Only explicit articles and compositions are indexed here, and it should be appreciated that a lot more must have been discovered at a very early stage. For example, the natural line in Schellenberg 1901 comes down to a win with R v K, and it is inconceivable that the winning nature of this elementary ending had not already been recognized.

Piece v piece: Klüver 1923, Klüver 1924, Niemann 1938 (nightriders), Leoncini and Magari 1980, Liardet 1991, Beasley 1996, Marks 1996 (king against zebra), Beasley 1999/1, Liardet 1999/5.

Piece v pawn: Klüver 1923, Klüver 1924, Panteleit 1975, Panteleit 1977, Magari 1979, Leoncini and Magari 1980, Beasley 1993, Beasley 1996/1.

Pawn v pawn: Törngren 1929, Salvadori 1979, Leoncini and Magari 1980.

Exceptional piece-against-piece winning positions are exploited in play as follows.

R v B: Liardet 1998/5.

B v K: Beasley 1999/2b, Goldovski 1999.

B v R: Törngren 1929, Hofmann 1956/2, Niemann 1948/1, van der Bilt 1997c, Liardet 1998/1, Liardet 1998/3b, Liardet 1998/5, game analysis in Liardet 1998/7.

N v K: Klüver 1923c, Hofmann 1956/1, Mortensen 1960, Liardet 1997/2a, Liardet 1998/2, Liardet 1998/3a, Liardet 1998/4, Liardet 1998/8b, Beasley 1999/2a, Liardet 1999/10a.

N v R: Liardet 1998/3ab, Liardet 1998/8b.

N v B: Sunyer 1930, Slater 1935, Niemann 1948/2, Klüver 1949, Magari 1979, Evseev 1992/2, Beasley 1997/1, van der Bilt 1997ab, Liardet 1997/3, Liardet 1998/4, Liardet 1999/6d, Liardet 1999/9i, Liardet 1999/10gi.

Three men

Three-man pawnless endings are examined in general terms in Beasley 1999/1 and Liardet 1999/6, and three-man endings with at least one pawn in Angrim 1999/1, Angrim 1999/3, Liardet 1999/8, and Liardet 1999/11. Individual endings are further examined or exploited as follows.

K v KQ: Klüver 1924b, Fabel and Klüver 1947a.

K v KR: Klüver 1924b, Klüver 1948, Leoncini and Magari 1980f, Liardet 1999/6e, Liardet 1999/9a (in play).

K v KB: Klüver 1924b, Fabel and Klüver 1947b (in play), Byway 1998c (in play), Byway 1998d.

K v KN: Klüver 1924b, Liardet 1997/2b (in play).

K v KP: Beasley 1989, Liardet 1999/8a.

K v 2Q: Beasley 1998/5.

K v QB: Kuhlmann 1980 (in play), Beasley 1999/1.

K v QN: Klüver 1924b, Liardet 1991, Liardet 1997/2a (in play), Beasley 1999/1.

K v RB: Klüver 1934a, Leoncini and Magari 1980d, Liardet 1991e, game analysis in Liardet 1998/7, Liardet 1999/6g.

K v RN: Klüver 1923b, Klüver 1924b, Geerlings 1997 (in play), Liardet 1997/2a (in play), Liardet 1997/3 (in play), Liardet 1999/6e.

K v RP: Hofmann 1952 (in play), Hofmann 1956/1, Büsing 1983/a (in play), Liardet 1999/8b.

K v 2B: Leoncini and Magari 1980g, Liardet 1991d, Beasley 1998/5, Liardet 1999/6f.

K v BN: Beasley 1999/2b.

K v BP: Kahl 1951b (in play), Liardet 1999/8a.

K v 2N: Beasley 1999/2a, Beasley 1999/3.

K v NP: Goldovski 1999, Liardet 1999/8a.

K v 2P: Klüver 1923c, Hofmann 1952, Leoncini and Magari 1980e, Büsing 1983/2a.

Q v 2K: Byway 1995 (in play).

Q v KB: Byway 1995 (in play).

Q v KN: Niemann 1947 (in play), Liardet 1991, Byway 1995 (in play), Geerlings 1997 (in play), Beasley 1998/2b, Liardet 1999/4, Liardet 1999/6.

(continued)

Three men (continued)

Q v BP: Angrim 1999/3.
Q v 2N: Liardet 1991.
Q v 2P: Liardet 1999/11c.
R v KB: Byway 1998c (in play).
R v KN: Geerlings 1997 (in play), Liardet 1997/2b (in play).
R v BN: Sekhar and Shankar 1987a.
R v 2N: Liardet 1991f, Beasley 1998/1, Liardet 1999/6b.
B v KN: Liardet 1991c, Byway 1998a (in play), Liardet 1999/6d, Liardet 1999/9b, Liardet 1999/10k (in play).
B v KP: Liardet 1999/9c.
B v QN: Beasley 1998/5.
B v 2R: Liardet 1998/1 (in play), Liardet 1998/5 (in play).
B v RN: Niemann 1948/2.
B v BP: Beasley 1996/2.
B v NP: Geerlings 1997 (in play).
N v KQ: Byway 1998ab (in play).
N v KR: Kuhlmann 1980 (in play), Byway 1998ab (in play).
N v KN: Beasley 1997/2, Liardet 1998/3a (in play), Liardet 1999/6c, Liardet 1999/10n (in play).
N v KP: Liardet 1999/11a.
N v QN: Liardet 1999/6c, Liardet 1999/9f.
N v RN: Liardet 1998/3a (in play), Liardet 1999/6c.
N v RP: Liardet 1999/11b.
N v BN: Panteleit 1975a (in play), Kuhlmann 1980 (in play), Liardet 1991b, Liardet 1997/1 (in play), Beasley 1998/2a, Beasley 1998/4 (in play), Liardet 1999/6c, Liardet 1999/10d (in play).
N v 2N: Klüver 1924b, Fabel 1947, Hansson 1948, Magari 1978, Leoncini and Magari 1980c, Evseev 1992/1, Evseev and Poisson 1993, Beasley 1997/5, Liardet 1999/6a.
N v NP: Panteleit 1975a, Liardet 1997/1, Beasley 1998/4.
N v 2P: Evseev 1992/2 (in play), Beasley 1997/4, van der Bilt 1997ab (the latter in play).
P v KQ: Byway 1998b.
P v KR: Byway 1998b.
P v KB: Fabel and Klüver 1947b, Byway 1998c.
P v KP: Byway 1998a, Liardet 1999/9a.
(continued)

Three men (continued)

P v QP: Angrim 1999/1.
P v 2R: Klüver 1923f.
P v RN: Liardet 1999/11d.
P v RP: Liardet 1998/5, Liardet 1998/7, Liardet 1998/8a, Liardet 1999/8c.
P v 2N: Klüver 1923e, Mortensen 1960, Beasley 1997/1.
P v NP: Geerlings 1997.
P v 2P: Liardet 1997/3, Angrim 1999/1.

Four men

Four-man endings are examined in general terms in Angrim 1999/2, Angrim 1999/4-6, Liardet 1999/7, Liardet 1999/10, and Liardet 1999/12-13. Individual endings are further examined or exploited as follows.

One man against three

K v 3K: Liardet 1999/7d.
K v KKR: Liardet 1999/7c.
K v KRR: Liardet 1999/7b, Liardet 1999/9d.
K v KBN: Angrim 1999/2l.
K v KBP: Angrim 1999/2l.
K v KNP: Angrim 1999/2l.
K v KPP: Angrim 1999/2l.
K v QBB: Liardet 1999/12bc.
K v QNP: Angrim 1999/2m.
K v RRB: Leoncini and Magari 1980d.
K v RBP: Kahl 1951b (in play), Liardet 1999/10e.
K v BNP: Angrim 1999/2l.
K v NPP: Liardet 1999/9e.
K v 3P: Liardet 1999/10f, Leoncini and Magari 1980e.
Q v KPP: Byway 1995.
R v 3K: Liardet 1999/7a, Liardet 1999/10uv, Liardet 1999/12d.
R v KKR: Liardet 1999/10w, Liardet 1999/12e.
R v KKN: Liardet 1999/13p.
R v KKP: Liardet 1999/13q.
R v KBP: Liardet 1999/10x.
B v QNN: Liardet 1999/10j.
B v RRP: Dawson 1925b, Liardet 1999/13n.
B v RNN: Liardet 1999/10i.
B v RNP: Liardet 1999/10kl.
B v 3N: Angrim 1999/2n, Liardet 1999/9i, Liardet 1999/10gh.
B v 3P: Wood 1994.
(continued)

One man against three (continued)

N v KKB: Liardet 1999/10m.
N v KKN: Liardet 1999/10n.
N v KKP: Liardet 1999/10o.
N v KRB: Liardet 1999/13o.
N v KRN: Liardet 1998/8b.
N v KBB: Liardet 1999/10pq.
N v RRB: Liardet 1999/10s.
N v RRN: Liardet 1999/10t.
N v RBB: Liardet 1999/10r.
N v RPP: van der Bilt 1997b.
N v 3N: Magari 1978, Leoncini and Magari 1980c.
N v 3P: Evseev 1992/2.
P v KBN: Angrim 1999/2l.
P v KBP: Angrim 1999/2l.
P v KNP: Angrim 1999/2l.
P v KPP: Angrim 1999/2o.
P v QNP: Angrim 1999/2p.
P v RNP: Kohli 1998.
P v RPP: Beasley 1996/2.
P v BNP: Angrim 1999/2l.
P v 3N: Sunyer 1930.
P v NPP: Angrim 1999/2l.
P v 3P: Beasley 1996/2.
Single-step movers: Magari 1978.

Two men against two

2K v QR: Angrim 1999/7.
2K v RP: Liardet 1998/2.
2K v BN: Angrim 1999/2a.
2K v 2N: Angrim 1999/2b, Liardet 1999/10a.
KQ v KB: Angrim 1999/2c.
KQ v KN: Angrim 1999/2f, Liardet 1999/13c.
KQ v RB: Liardet 1999/12a.
KQ v BN: Liardet 1999/13j.
KQ v 2N: Liardet 1999/10c.
KR v QR: Liardet 1999/10b.
KR v RN: Angrim 1999/2g, Liardet 1999/9g.
KR v BN: Liardet 1999/13i.
KB v QR: Angrim 1999/2d.
KB v RB: Sekhar and Shankar 1987b.
KB v RN: Liardet 1999/13a.
KB v RP: Liardet 1999/13b.
KB v 2P: Angrim 1999/2e.
KN v KP: Liardet 1999/2a, Liardet 1997/2b (in play).

(continued)

Two men against two (continued)

KN v 2Q: Liardet 1999/13h.
KN v QR: Liardet 1999/13fg.
KN v QP: Niemann 1947.
KN v RP: Liardet 1998/4.
KN v RB: Liardet 1999/13de.
KN v BP: Liardet 1997/2b (in play).
KN v 2P: Liardet 1997/2b.
KP v 2P: Kuhlmann 1980.
QR v BP: Angrim 1999/5a, Liardet 1999/13m.
QB v 2N: Angrim 1999/2h, Liardet 1999/9h.
QP v RP: Angrim 1999/2k.
2R v 2P: Angrim 1999/2j.
RB v RN: Liardet 1999/13kl.
RN v BN: Liardet 1999/10d.
RP v RP: Hofmann 1956/2.
BP v BP: Beasley 1996/2.
2N v 2N: Klüver 1924d, Fabel 1947, Charosh 1948, Hansson 1948, Magari 1978, Leoncini and Magari 1980c, Angrim 1999/2i.
NP v NP: Liardet 1997/2a.
NP v 2P: Dornieden 1967, Büsing 1983/1.
2P v 2P: Klüver 1934b.

Five men (one against four)

K v BNPP: Schmidt and Kniest 1948.
K v 4P: Leoncini and Magari 1980e.
R v KBPP: van der Bilt 1997c.
B v BNPP: Schlensker and Kniest 1948 (in play).
P v NPPP: Watney 1923.

Five men (two against three)

KN v KNP: Klüver 1949.
KP v QPP: Boyer 1955/2 (in play), Klüver 1957, Slater 1958.
2R v 3P: Liardet 1998/1.
RP v NPP: Liardet 1998/3b.
BN v KPP: Slater 1935.
BP v RNP: Roese 1923.
BP v BNP: Beasley 1996/2.
NP v RPP: van der Bilt 1997d.
NP v BPP: Büsing 1983/1.
NP v NPP: Carfora 1978.
2P v KPP: van der Bilt 1997e.
2P v QPP: Boyer 1955/1.
2P v RPP: Büsing 1983/2b.
2P v BNN: Minieri 1979.
2P v 3P: Niemann 1948/1.