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Combinatorial Games: Selected Bibliography With A Succinct Gourmet Introduction

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1. What are Combinatorial Games? What are they Good For?

Roughly speaking, the family of *combinatorial games* consists of two-player games with perfect information (no hidden information as in some card games), no chance moves (no dice) and outcome restricted to (lose, win), (tie, tie) and (draw, draw) for the two players who move alternately. Tie is an end position such as in tic-tac-toe, where no player wins, whereas draw is a dynamic tie: any position from which a player has a nonlosing move, but cannot force a win. Both the easy game of Nim and the seemingly difficult chess are examples of combinatorial games. We use the shorter terms *game* and *games* below to designate combinatorial games.

Amusing oneself with games may sound like a frivolous occupation. But the fact is that the bulk of interesting and natural mathematical problems that are hardest in complexity classes beyond *NP*, such as *P*space, *E*xptime and *E*xpspace, are two-player games; occasionally even one-player games (puzzles) or even zero-player games (Conway's "Life"). Two of the reasons for the high complexity of two-player games are outlined below. Before that we note that in addition to a natural appeal of the subject, there are applications or connections to various areas, including complexity, logic, graph and matroid theory, networks, error-correcting codes, surreal numbers, on-line algorithms and biology.

But when the chips are down, it is this "natural appeal" that compels both amateurs and professionals to become addicted to the subject. What is the essence of this appeal? Perhaps it is rooted in our primal beastly instincts; the desire to corner, torture, or at least dominate our peers. An intellectually refined version of these dark desires, well hidden under the façade of scientific research, is the consuming strive "to beat them all", to be more clever than the most clever, in short — to create the tools to *Math-mas*ter them all in hot *comb*inatorial *comb*at! Reaching this goal is particularly satisfying and sweet in the context of combinatorial games, in view of their inherent high complexity.

2. Why are Combinatorial Games Hard?

Decision problems such as graph hamiltonicity and Traveling Salesperson (Is there a round tour through specified cities of cost $\leq C$?) are *existential*: they involve a single existential quantifier ("Is there...?"). In mathematical terms an existential problem boils down to finding a path, in a large "decision-tree" of all possibilities, that satisfies specified properties. The above two problems, as well as thousands of other interesting and important combinatorial-type problems are NP-*complete*. This means that they are *conditionally intractable*, i.e., the best way to solve them seems to require traversal of most if not all of the decision tree, whose size is exponential in the input size of the problem. No better method is known to date at any rate, and if an efficient solution will ever be found for any NP-complete problem, then all NP-complete problems will be solvable efficiently.

The decision problem whether White can win if White moves first in a chess game, on the other hand, has the form: Is there a move of White such that for every move of Black there is a move of White such that for every move of Black there is a move of White ... such that White can win? Here we have a large number of alternating quantifiers rather than a single existential one. We are looking for an entire subtree rather than just a path in the decision tree. The problem for generalized chess on an $n \times n$ board is in fact Exptime-complete, which is a *provable intractability*. Most games are at least Pspace-hard.

Put in simple language, in analyzing an instance of Traveling Salesperson, the problem itself is passive: it does not resist your attempt to attack it, yet it is difficult. In a game, in contrast, there is your opponent, who, at every step, attempts to foil your effort to win. It's similar to the difference between an autopsy and surgery. Einstein, contemplating the nature of physics said, "Der Allmächtige ist nicht boshaft; Er ist raffiniert" (The Almighty is not mean; He is sophisticated). NP-complete existential problems are perhaps sophisticated. But your opponent in a game can be very mean!

Another reason for the high complexity of games is connected with the fundamental notion of *sum* (disjunctive compound) of games. A sum is a finite collection of disjoint games; often very basic, simple games. Each of the two players, at every turn, selects one of the games and makes a move in it. If the outcome is not a draw, the sum-game ends when there is no move left in any of the component games. If the outcome is not a tie either, then in *normal* play, the player first unable to move loses and the opponent wins. The outcome is reversed in *misère* play.

The *game-graph* of a game is a directed graph whose vertices are the positions of the game, and (u, v) is an edge if and only if there is a move from position u to position v. It turns out that the game-graph of a sum has size exponential in the combined size of the input game-graphs! Since sums occur naturally and frequently, and since analyzing the sum entails reasoning about its game-graph, we are faced with a problem that is *a priori* exponential, quite unlike most present-day interesting existential problems.

3. Breaking the Rules

As the experts know, some of the most exciting games are obtained by breaking some of the rules for combinatorial games, such as permitting a player to pass a bounded or unbounded number of times, relaxing the requirement that players play alternately, or permitting a number of players other than two. But by far the most fruitful tampering with the rules seems to be to permit sums of games that are not quite fixed (which explains why misère play of sums of games is much harder than normal play) or not quite disjoint (Welter) or the game does not seem to decompose into a sum (Geography or Poset Games).

On the other hand, permitting a payoff function other than $(0, 1) = (\text{lose}, \text{win})$ or $(\frac{1}{2}, \frac{1}{2}) = (\text{draw}, \text{draw})$ usually, but not always, leads to games that are not considered to be combinatorial games, or to borderline cases.

4. Why Is the Bibliography Vast?

In the realm of existential problems, such as sorting or Traveling Salesperson, most present-day interesting decision problems can be classified into tractable, conditionally intractable, and provably intractable ones. There are exceptions, to be sure, e.g. graph isomorphism and primality testing, whose complexity is still unknown. But these are few. It appears that, in contrast, there is a very large set of games whose complexities are hard to determine. The set of these games is termed *Wonderland*, because we are wondering about the complexity classification of its members. Only few games have been classified into the complexity classes they belong to. Today, most games belong to Wonderland, and despite recent impressive progress, the tools for reducing Wonderland are still few and inadequate.

To give an example, many interesting games have a very succinct input size, so a polynomial strategy is often more difficult to come by (Octal games; Grundy's game). Succinctness and non-disjointness of games in a sum may be present simultaneously (poset games). In general, "breaking the rules" and the alternating quantifiers add to the volume of Wonderland. We suspect that the large size of Wonderland, a fact of independent interest, is the main contributing factor to the bulk of the bibliography on games.

5. Why Isn't it Larger?

The bibliography below is a partial list of books and articles on combinatorial games and related material. It is partial not only because I constantly learn of additional relevant material I did not know about previously, but also because of certain self-imposed restrictions. The most important of these is that only papers with some original and nontrivial mathematical content are considered. This excludes most historical reviews of games and most, but not all, of the work on heuristic or artificial intelligence approaches to games, especially the large literature concerning computer chess. I have, however, included the compendium Levy [1988], which, with its 50 articles and extensive bibliography, can serve as a first guide to this world. Also some papers on chess-endgames and clever exhaustive computer searches of some games have been included.

On the other hand, papers on games that break some of the rules of combinatorial games are included liberally, as long as they are interesting and retain a combinatorial flavor. These are vague and hard to define criteria, yet combinatorialists usually recognize a combinatorial game when they see it. Besides, it is interesting to break also this rule sometimes! Adding borderline cases is acknowledged in the "related material" postfixed to the title of this bibliography. We have included some references to one-player games, e.g., towers of Hanoi, n-queen problems and peg-solitaire, but hardly any on zero-player games (such as Life). We have also included papers on various applications of games, especially when the connection to games is substantial or the application is important.

In 1990, *Theoretical Computer Science* inaugurated a Mathematical Games Section whose main purpose is to publish papers on combinatorial games. The "Aims and Scope" and the names and addresses of the Mathematical Games Section editors are printed in the first issue of every volume of TCS. Prospective authors are cordially invited to submit their papers (in triplicate), to one of the editors whose interests seem closest to the field covered by the paper. This forum is beginning to become a focal point for high-class research results in the field of combinatorial games, thus increasing the bibliography at a moderate pace.

6. Cold and Hot Versions

The game bibliography below is very dynamic in nature. Previous versions have been circulated to colleagues for many years, intermittently, since the early 80's. Prior to every mailing updates were prepared, and usually also afterwards, as a result of the comments received from several correspondents. The listing can never be "complete". Thus also the present form of the bibliography is by no means complete.

Because of its dynamic nature, it is natural that the bibliography now became a "Dynamic Survey" in the Dynamic Surveys (DS) section of the *Electronic Journal of Combinatorics* (ElJC) and *The World Combinatorics Exchange* (WCE). The ElJC and WCE are on the World Wide Web (WWW), and the DS can be accessed at http://ejc.math.gatech.edu:8080/Journal/Surveys/index.html. This document contains a copy of the *cold* version of the bibliography, together with the date of the latest modification.

Any document on the WWW may contain short text portions (underlined, or colored) that are *hypertext*, that is, that contain a hidden link to another relevant document. Clicking with your mouse on this *hot* hypertext brings up that document onto your screen, wherever in the world it may physically reside. Portions of that document may also be hot (clickable), and so the entire world is hyperlinked into a web, that is, virtualized into a complex mosaic, all at your fingertips. In fact, a good way to access the WWW is through mouse-activated browsers (Mosaic, Netscape, etc.)!

It is thus natural to have also a *hot* version of the bibliography. In it, the bibliographic items are hypertext, and so clicking on a hot item retrieves the document itself, displaying it on your screen for browsing, reading or downloading.

7. Hot and Cold Help

For the hot version to grow into a bibliography of practical value, we need the links to the bibliographic items. These links are mainly of two types.

- Links to papers published in refereed electronic journals, proceedings or books published by scientific societies or commercial enterprises directly from authors' TEX-files. At this time there are only few of these, but that is likely to change rapidly.
- Links to the documents in the authors' own home directories or ftp archives.

Authors and readers who have this information are requested to send it to me. Note that some copyright questions may be involved. Each author should clear those prior to submitting the hyper-links to me. Authors should send *updates* of the links to the Managing Editor of ElJC at calkin@math.gatech.edu. Updates should be sent whenever there is a change in the link, due, for example, to host and/or directory changes; even if a file is replaced by a compressed version of it, since its name changed!

Regarding the cold and hot versions alike, I wish to ask the readers to continue sending to me corrections and comments; and inform me of significant omissions, remembering, however, that it is a *selected* bibliography. I prefer to get reprints, preprints or URL's, rather than only titles, whenever possible.

8. Games on Web Sites

Material on games is mushrooming on the Web. Below we bring only some highlights. Following these URL's—which will become hot once this file does—the reader will be lead to many others. Caution: links often get stale as people and files shift about. But the many interlinks included in the Web pages listed below will presumably enable you to overcome this problem. Please send me URL's of additional interesting game sites.

- "Topics in Mathematical Recreations" at: http://www.dcs.st-andrews.ac.uk/~ad/mathrecs/mathrectopics.html has very useful links to topics in recreational math, including a bibliography (mainly on puzzles) and some actual puzzles. It is maintained by Tony Davie.
- An excellent games page is maintained by David Eppstein of UC Irvine at: http://www.ics.uci.edu/~eppstein/cgt/ Theory, bibliography, papers and many actual games can be accessed. Also much material on recreational math can be clicked on.
- A loaded page entitled "Mathematical Games, Toys, and Puzzles" is maintained by Jeff Erickson of UC Berkeley, at: http://http.cs.berkeley.edu/~jeffe/mathgames.html It is divided into "Theory", "Actual Games" (Connect, Othello,...) and "Fun Math".
- Daniel Loeb of University of Bordeaux, has attractive game theoretic material, including Multiplayer Combinatorial Games, Recreational Mathematics and Mathematical Education at: http://www.labri.u-bordeaux.fr/~loeb/game.html
- Andrew Plotkin of Carnegie Mellon University created "Zarf's List of Interactive Games on the Web" at: http://www.cs.cmu.edu/afs/andrew/org/kgb/www/zarf/games.html It contains large collections of games you can actually play on the Web, divided into 4 main categories: Interactive Games, Older Games, Interactive Toys and Older Toys.
- Dave Stanworth created the "Games Domain" at: http://www.gamesdomain.co.uk/ It contains links to a huge *searchable* selection of games of all sorts, including video games. (The searcher should be modified: "Go" is not found by it, though it exists under "board games" and elsewhere.) In its "Games Information" alone there are hundreds of links.
- Mario Velucchi of University of Pisa at: http://www.cli.di.unipi.it/~velucchi/personal.html has extensive and very nice material on chess and its variations. Links to recreational math and mathematical games sites are also included.

- David Wolfe at UC Berkeley, a former Ph.D. student of Elwyn Berlekamp, created the Gamesman's Toolkit [Wolfe 1996] and has a link to a Postscript file of Unsolved Problems in Combinatorial Games of Richard Guy. See: http://http.cs.berkeley.edu/~wolfe/

9. Idiosyncrasies

Due to the changes announced in Section 7, hard copies of the bibliography will not be mailed out any more, with the possible exception of a few copies to individuals without access to the Internet.

Most of the bibliographic entries refer to items written in English, though there is a sprinkling of Danish, Dutch, French, German, Japanese, Slovakian and Russian, as well as some English translations from Russian. The predominance of English may be due to certain prejudices, but it also reflects the fact that nowadays the *lingua franca* of science is English. In any case, I'm soliciting also papers in languages other than English, especially if accompanied by an abstract in English.

On the administrative side, Technical Reports, submitted papers and unpublished theses have normally been excluded; but some exceptions have been made. Abbreviations of book series and journal names follow the *Math Reviews* conventions. Another convention is that de Bruijn appears under D, not B; von Neumann under V, not N, McIntyre under M not I, etc.

Earlier versions of this bibliography have appeared, under the title "Selected bibliography on combinatorial games and some related material", as the master bibliography for the book *Combinatorial Games* (*Proc. Symp. Appl. Math.* **43**, edited by R. K. Guy, AMS, 1991), with 400 items, and in the *Dynamic Surveys* section of the *Electronic J. of Combinatorics* in November 1994, with 542 items.

10. Suggestions and Questions

Two correspondents and myself have expressed the opinion that the value of the bibliography would be enhanced if it would be transformed into an annotated bibliography. Do you think this should be done?

One correspondent has suggested to include a list of combinatorial games people, with email addresses and URL's, where available.

One correspondent and myself think that the bibliography has, after the August 1995 update, become somewhat unwieldy:

1. Should henceforth new additions be kept in separate files? Disadvantage: machine searching will have to be done on several (.tex) files, and visual search on several .ps files. However, some of the older updates may be merged with the main part, after a while.

2. The bibliography could be broken up into sections of related papers. Thus, zero-person and one-person games could be in one section, games of imperfect information or those with chance moves in another, complexity papers in a third, partizan games in another, impartial games in still another, etc. The disadvantage here is that some papers will belong to several sections. For example, papers dealing with complexity aspects of impartial games, or of games with imperfect information. This could be amended by using crossreferences to other sections, at the price of some further unwieldiness.

3. Any other suggestions?

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12. The Bibliography

1. B. Abramson and M. Yung [1989], Divide and conquer under global constraints: a solution to the n-queens problems, *J. Parallel Distrib. Comput.* **6**, 649–662.
2. A. Adachi, S. Iwata and T. Kasai [1981], Low level complexity for combinatorial games, Proc. 13th Ann. ACM Symp. Theory of Computing (Milwaukee, WI, 1981), Assoc. Comput. Mach., New York, NY, pp. 228–237.
3. A. Adachi, S. Iwata and T. Kasai [1984], Some combinatorial game problems require $\Omega(n^k)$ time, *J. Assoc. Comput. Mach.* **31**, 361–376.
4. H. Adachi, H. Kamekawa and S. Iwata [1987], Shogi on $n \times n$ board is complete in exponential time, *Trans. IEICE* **J70-D**, 1843–1852 (in Japanese).
5. W. Ahrens [1910], *Mathematische Unterhaltungen und Spiele*, Zweite vermehrte und verbesserte Auflage, Vol. I, Teubner, Leipzig.

6. M. Aigner and M. Fromme [1984], A game of cops and robbers, *Discrete Appl. Math.* **8**, 1–12.
7. M. Ajtai, L. Csirmaz and Zs. Nagy [1979], On a generalization of the game Go-Moku I, *Studia Scientiarum Math. Hungar.* **14**, 209–226.
8. E. Akin and M. Davis [1985], Bulgarian solitaire, *Amer. Math. Monthly* **92**, 237–250.
9. R. E. Allardice and A. Y. Fraser [1884], La tour d'Hanoï, *Proc. Edinburgh Math. Soc.* **2**, 50–53.
10. D. T. Allemang [1984], Machine computation with finite games, M. Sc. thesis, Cambridge University.
11. J. D. Allen [1989], A note on the computer solution of Connect-Four, *Heuristic Programming in Artificial Intelligence*, 1: *The First Computer Olympiad* (D. N. L. Levy and D. F. Beal, eds.), pp. 134–135, Ellis Horwood, Chichester, England.
12. L. V. Allis and P. N. A. Schoo [1992], Qubic solved again, *Heuristic Programming in Artificial Intelligence*, 3: *The Third Computer Olympiad* (H. J. van den Herik and L. V. Allis, eds.), pp. 192–204, Ellis Horwood, Chichester, England.
13. L. V. Allis, H. J. van den Herik and M. P. H. Huntjens [1993], Go-Moku solved by new search techniques, Proc. 1993 AAAI Fall Symp. on Games: Planning and Learning, AAAI Press Tech. Report FS93-02, pp. 1–9, Menlo Park, CA.
14. J.-P. Allouche, D. Astoorian, J. Randall and J. Shallit [1994], Morphisms, squarefree strings, and the tower of Hanoi puzzle, *Amer. Math. Monthly* **101**, 651-658.
15. S. Alpern and A. Beck [1991], Hex games and twist maps on the annulus, *Amer. Math. Monthly* **98**, 803–811.
16. I. Althöfer [1988], Nim games with arbitrary periodic moving orders, *Internat. J. Game Theory* **17**, 165–175.
17. I. Althöfer [1988], On the complexity of searching game trees and other recursion trees. *J. Algorithms* **9**, 538–567.
18. I. Althöfer [1989], Generalized minimax algorithms are no better error correctors than minimax is itself, in: *Advances in Computer Chess* **5** (D. F. Beal, ed.), Elsevier, Amsterdam, pp. 265–282.
19. I. Althöfer and J. Bültermann [1995], Superlinear period lengths in some subtraction games, *Theor. Comput. Sci.* (*Math Games*) **148**, 111–119.
20. M. Anderson and F. Harary [1987], Achievement and avoidance games for generating abelian groups, *Internat. J. Game Theory* **16**, 321–325.
21. R. Anderson, L. Lovász, P. Shor, J. Spencer, É. Tardós and S. Winograd [1989], Disks, balls and walls: analysis of a combinatorial game, *Amer. Math. Monthly* **96**, 481–493.

22. T. Andreae [1984], Note on a pursuit game played on graphs, *Discrete Appl. Math.* **9**, 111–115.

23. T. Andreae [1986], On a pursuit game played on graphs for which a minor is excluded, *J. Combin. Theory* (Ser. B) **41**, 37–47.

24. R. P. Anstee and M. Farber [1988], On bridged graphs and cop-win graphs, *J. Combin. Theory* (Ser. B) **44**, 22–28.

25. M. Ascher [1987], Mu Torere: An analysis of a Maori game, *Math. Mag.* **60**, 90–100.

26. I. M. Asel'derova [1974], On a certain discrete pursuit game on graphs, *Cybernetics* **10**, 859–864 (trans. of *Kibernetika* **10** (1974) 102–105).

27. J. A. Aslam and A. Dhagat [1993], On-line algorithms for 2-coloring hypergraphs via chip games, *Theoret. Comput. Sci.* (*Math Games*) **112**, 355–369.

28. M. D. Atkinson [1981], The cyclic towers of Hanoi, *Inform. Process. Lett.* **13**, 118–119.

29. J. M. Auger [1991], An infiltration game on k arcs, *Naval Research Logistics* **38**, 511–529.

30. R. Austin [1976], Impartial and partisan games, M. Sc. Thesis, Univ. of Calgary.

31. J. O. A. Ayeni and H. O. D. Longe [1985], Game people play: Ayo, *Internat. J. Game Theory* **14**, 207–218.

32. L. Babai and S. Moran [1988], Arthur-Merlin games: a randomized proof system, and a hierarchy of complexity classes, *J. Comput. System Sci.* **36**, 254–276.

33. C. K. Bailey and M. E. Kidwell [1985], A king's tour of the chessboard, *Math. Mag.* **58**, 285–286.

34. W. W. R. Ball and H. S. M. Coxeter [1987], *Mathematical Recreations and Essays*, 13th ed., Dover, New York, NY.

35. R. B. Banerji [1971], Similarities in games and their use in strategy construction, Proc. Symp. Computers and Automata (J. Fox, ed.), Polytechnic Press, Brooklyn, NY, pp. 337–357.

36. R. B. Banerji [1980], *Artificial Intelligence, A Theoretical Approach*, Elsevier, North-Holland, New York, NY.

37. R. B. Banerji and C. A. Dunning [1992], On misere games, *Cybernetics and Systems* **23**, 221–228.

38. R. B. Banerji and G. W. Ernst [1972], Strategy construction using homomorphisms between games, *Artificial Intelligence* **3**, 223–249.

39. R. Bar Yehuda, T. Etzion and S. Moran [1993], Rotating-table games and derivatives of words, *Theoret. Comput. Sci.* (*Math Games*) **108**, 311–329.

40. I. Bárány [1979], On a class of balancing games, *J. Combin. Theory* (Ser. A) **26**, 115–126.

41. J. G. Baron [1974], The game of nim — a heuristic approach, *Math. Mag.* **74**, 23–28.

42. R. Barua and S. Ramakrishnan [1996], σ-game, σ^+-game and two-dimensional additive cellular automata, *Theoret. Comput. Sci.* (*Math Games*) **154**, 349–366.

43. V. J. D. Baston and F. A. Bostock [1985], A game locating a needle in a cirular haystack, *J. Optimization Theory and Applications* **47**, 383–391.

44. V. J. D. Baston and F. A. Bostock [1986], A game locating a needle in a square haystack, *J. Optimization Theory and Applications* **51**, 405–419.

45. V. J. D. Baston and F. A. Bostock [1987], Discrete hamstrung squad car games, *Internat. J. Game Theory* **16**, 253–261.

46. V. J. D. Baston and F. A. Bostock [1989], A one-dimensional helicopter-submarine game, *Naval Research Logistics* **36**, 479–490.

47. J. Baumgartner, F. Galvin, R. Laver and R. McKenzie [1975], Game theoretic versions of partition relations, Colloquia Mathematica Societatis János Bolyai **10**, Proc. Internat. Colloq. on Infinite and Finite Sets, Vol. 1 (A. Hajnal, R. Rado and V. T. Sós, eds.), Keszthely, Hungary, 1973, North-Holland, pp. 131–135.

48. J. D. Beasley [1985], *The Ins & Outs of Peg Solitaire*, Oxford University Press, Oxford.

49. J. D. Beasley [1990], *The Mathematics of Games*, Oxford University Press, Oxford.

50. A. Beck [1969], Games, Chapter 5 in: A. Beck, M. N. Bleicher and D. W. Crowe, *Excursions into Mathematics*, Worth Publ., pp. 317–387.

51. J. Beck [1981], On positional games, *J. Combin. Theory* (Ser. A) **30**, 117–133.

52. J. Beck [1981], Van der Waerden and Ramsey type games, *Combinatorica* **1**, 103–116.

53. J. Beck [1982], On a generalization of Kaplansky's game, *Discrete Math.* **42**, 27–35.

54. J. Beck [1982], Remarks on positional games, I, *Acta Math. Acad. Sci. Hungar.* **40**(1–2), 65–71.

55. J. Beck [1985], Random graphs and positional games on the complete graph, *Ann. Discrete Math.* **28**, 7–13.

56. J. Beck and L. Csirmaz [1982], Variations on a game, *J. Combin. Theory* (Ser. A) **33**, 297–315.

57. R. C. Bell [1960, 1969], *Board and Table Games* (two volumes), Oxford University Press.

58. S. J. Benkoski, M. G. Monticino and J. R. Weisinger [1991], A survey of the search theory literature, *Naval Res. Logistics* **38**, 469–494.

59. G. Bennett [1994], Double dipping: the case of the missing binomial coefficient identities, *Theoret. Comput. Sci.* (*Math Games*) **123**, 351–375.

60. D. Berengut [1981], A random hopscotch problem or how to make Johnny read more, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 51–59.

61. B. Berezovskiy and A. Gnedin [1984], The best choice problem, *Akad. Nauk, USSR*, Moscow (in Russian).

62. C. Berge [1976], Sur lex jeux positionnels, *Cahiers du Centre Études Rech. Opér.* **18**, 91–107.

63. C. Berge [1977], Vers une théorie générale des jeux positionnels, Mathematical Economics and Game Theory, *Essays in honor of Oskar Morgentern*, (R. Henn and O. Moeschlin, eds.), *Lecture Notes in Economics* **141**, 13–24, Springer Verlag, Berlin.

64. C. Berge [1981], Some remarks about a Hex problem, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 25–27.

65. C. Berge [1985], *Graphs* (Chapter 14), North-Holland, Amsterdam.

66. C. Berge [1989], *Hypergraphs* (Chapter 4), Elsevier (French: Gauthier Villars 1988).

67. C. Berge and P. Duchet [1988], Perfect graphs and kernels, *Bull. Inst. Math. Acad. Sinica* **16**, 263–274.

68. C. Berge and P. Duchet [1990], Recent problems and results about kernels in directed graphs, *Discrete Math.* **86**, 27–31.

69. C. Berge and M. Las Vergnas [1976], Un nouveau jeu positionnel, le "Match-It", ou une construction dialectique des couplages parfaits, *Cahiers du Centre Études Rech. Opér.* **18**, 83–89.

70. E. R. Berlekamp [1972], Some recent results on the combinatorial game called Welter's Nim, Proc. 6th Ann. Princeton Conf. Information Science and Systems, pp. 203–204.

71. E. R. Berlekamp [1974], The Hackenbush number system for compresssion of numerical data, *Inform. and Control* **26**, 134–140.

72. E. R. Berlekamp [1988], Blockbusting and domineering, *J. Combin. Theory* (Ser. A) **49**, 67–116. An earlier version, entitled Introduction to blockbusting and domineering, appeared in: The Lighter Side of Mathematics, Proc. E. Strens Memorial Conf. on Recr. Math. and its History (R. K. Guy and R. E. Woodrow, eds.), Calgary, 1986, Spectrum Series, Math. Assoc. of America, Washington, DC, 1994, pp. 137–148.

73. E. R. Berlekamp [1991], Introductory overview of mathematical Go endgames, in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 73–100.

74. E. R. Berlekamp [1996], The economist's view of combinatorial games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
75. E. R. Berlekamp, J. H. Conway and R. K. Guy [1982], *Winning Ways* (two volumes), Academic Press, London.
76. E. R. Berlekamp and Y. Kim [1996], Where is the "Thousand-Dollar Ko?", in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
77. E. Berlekamp and D. Wolfe [1994], *Mathematical Go — Chilling Gets the Last Point*, A. K. Peters, Wellesley, MA 02181.
78. P. Berloquin [1976], *100 Jeux de Table*, Flammarion, Paris.
79. J. Bitar and E. Goles [1992], Parallel chip firing games on graphs, *Theoret. Comput. Sci.* **92**, 291–300.
80. A. Björner and L. Lovász [1992], Chip-firing games on directed graphs, *J. Algebraic Combin.* **1**, 305–328.
81. A. Björner, L. Lovász and P. Chor [1991], Chip-firing games on graphs, *European J. Combin.* **12**, 283–291.
82. D. Blackwell and M. A. Girshick [1954], *Theory of Games and Statistical Decisions*, Wiley, New York.
83. U. Blass and A. S. Fraenkel [1990], The Sprague-Grundy function of Wythoff's game, *Theoret. Comput. Sci.* (*Math Games*) **75**, 311–333.
84. M. Blidia [1986], A parity digraph has a kernel, *Combinatorica* **6**, 23–27.
85. M. Blidia, P. Duchet and F. Maffray [1993], On kernels in perfect graphs, *Combinatorica* **13**, 231–233.
86. H. L. Bodlaender [1991], On the complexity of some coloring games, *Intern. J. Foundations Computer Science* **2**, 133–147.
87. H. L. Bodlaender [1993], Complexity of path forming games, *Theoret. Comput. Sci.* (*Math Games*) **110**, 215–245.
88. H. L. Bodlaender and D. Kratsch [1992], The complexity of coloring games on perfect graphs, *Theoret. Comput. Sci.* (*Math Games*) **106**, 309–326.
89. K. D. Boklan [1984], The n-number game, *Fibonacci Quart.* **22**, 152–155.
90. E. Borel [1921], La théorie du jeu et les équations integrales à noyau symmetrique gauche, *C. R. Acad. Sci. Paris* **173**, 1304–1308.
91. C. L. Bouton [1902], Nim, a game with a complete mathematical theory, *Ann. of Math.* **3**(2), 35–39.
92. J. Boyce [1981], A Kriegspiel endgame, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 28–36.
93. A. Brousseau [1976], Tower of Hanoi with more pegs, *J. Recr. Math.* **8**, 169–178.

94. R. A. Brualdi and V. S. Pless [1993], Greedy codes, *J. Combin. Theory* (Ser. A) **64**, 10–30.

95. A. A. Bruen and R. Dixon [1975], The n-queen problem, *Discrete Math.* **12**, 393–395.

96. P. Buneman and L. Levy [1980], The towers of Hanoi problem, *Inform. Process. Lett.* **10**, 243–244.

97. D. W. Bushaw [1967], On the name and history of Nim, *Washington Math.* **11**, Oct. 1966. Reprinted in: *N. Y. State Math. Teachers J.* **17**, 52–55.

98. J-y. Cai, A. Condon and R. J. Lipton [1992], On games of incomplete information, *Theoret. Comput. Sci.* **103**, 25–38.

99. D. Calistrate [1996], The reduced canonical form of a game, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

100. C. Cannings and J. Haigh [1992], Montreal solitaire, *J. Combin. Theory* (Ser. A) **60**, 50–66.

101. A. K. Chandra, D. C. Kozen and L. J. Stockmeyer [1981], Alternation, *J. Assoc. Comput. Mach.* **28**, 114–133.

102. A. K. Chandra and L. J. Stockmeyer [1976], Alternation, Proc. 17th Ann. Symp. Foundations of Computer Science (Houston, TX, Oct. 1976), IEEE Computer Soc., Long Beach, CA, pp. 98–108.

103. S. M. Chase [1972], An implemented graph algorithm for winning Shannon switching games, *Commun. Assoc. Comput. Mach.* **15**, 253–256.

104. B. S. Chlebus [1986], Domino-tiling games, *J. Comput. System Sci.* **32**, 374–392.

105. F. R. K. Chung [1989], Pebbling in hypercubes, *SIAM J. Disc. Math.* **2**, 467–472.

106. F. R. K. Chung, J. E. Cohen and R. L. Graham [1988], Pursuit-evasion games on graphs, *J. Graph Theory* **12**, 159–167.

107. F. Chung, R. Graham, J. Morrison and A. Odlyzko [1995], Pebbling a chessboard, *Amer. Math. Monthly* **102**, 113–123.

108. V. Chvátal [1973], On the computational complexity of finding a kernel, Report No. CRM-300, Centre de Recherches Mathématiques, Université de Montréal.

109. V. Chvátal [1981], Cheap, middling or dear, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 44–50.

110. V. Chvátal [1983], Mastermind, *Combinatorica* **3**, 325–329.

111. V. Chvátal and P. Erdős [1978], Biased positional games, *Ann. Discrete Math.* **2**: Algorithmic Aspects of Combinatorics, (B. Alspach, P. Hell and D. J. Miller, eds.), Qualicum Beach, B. C., Canada, 1976, North-Holland, pp. 221–229.

112. D. S. Clark [1986], Fibonacci numbers as expected values in a game of chance, *Fibonacci Quart.* **24**, 263–267.
113. A. J. Cole and A. J. T. Davie [1969], A game based on the Euclidean algorithm and a winning strategy for it, *Math. Gaz.* **53**, 354–357.
114. D. B. Coleman [1978], Stretch: a geoboard game, *Math. Mag.* **51**, 49–54.
115. A. Condon [1989], *Computational Models of Games*, ACM Distinguished Dissertation, MIT Press, Cambridge, MA.
116. A. Condon [1992], The complexity of Stochastic games, *Information and Computation* **96**, 203–224.
117. A. Condon, J. Feigenbaum, C. Lund and P. Shor [1993], Probabilistically checkable debate systems and approximation algorithms for PSPACE-hard functions, Proc. 25th Ann. ACM Symp. Theory of Computing, Assoc. Comput. Mach., New York, NY, pp. 305–314.
118. A. Condon and R. E. Ladner [1988], Probabilistic game automata, *J. Comput. System Sci.* **36**, 452–489.
119. I. G. Connell [1959], A generalization of Wythoff's game, *Canad. Math. Bull.* **2**, 181–190.
120. J. H. Conway [1972], All numbers great and small, Univ. of Calgary Math. Dept. Res. Paper No. 149.
121. J. H. Conway [1976], *On Numbers and Games*, Academic Press, London.
122. J. H. Conway [1977], All games bright and beautiful, *Amer. Math. Monthly* **84**, 417–434.
123. J. H. Conway [1978], A gamut of game theories, *Math. Mag.* **51**, 5–12.
124. J. H. Conway [1978], Loopy Games, *Ann. Discrete Math.* **3**: Proc. Symp. Advances in Graph Theory, Cambridge Combinatorial Conf. (B. Bollobás, ed.), Cambridge, May 1977, pp. 55–74.
125. J. H. Conway [1990], Integral lexicographic codes, *Discrete Math.*, **83**, 219–235.
126. J. H. Conway [1991], Numbers and games, in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 23–34.
127. J. H. Conway [1991], More ways of combining games, in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 57–71.
128. J. H. Conway [1996], The angel problem, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
129. J. H. Conway and H. S. M. Coxeter [1973], Triangulated polygons and frieze patterns, *Math. Gaz.* **57**, 87–94; 175–183.

130. J. H. Conway and N. J. A. Sloane [1986], Lexicographic codes: error-correcting codes from game theory, *IEEE Trans. Inform. Theory* **IT-32**, 337–348.
131. M. Copper [1993], Graph theory and the game of sprouts, *Amer. Math. Monthly* **100**, 478–482.
132. H. S. M. Coxeter [1953], The golden section, phyllotaxis and Wythoff's game, *Scripta Math.* **19**, 135–143.
133. J. W. Creely [1987], The length of a two-number game, *Fibonacci Quart.* **25**, 174–179.
134. J. W. Creely [1988], The length of a three-number game, *Fibonacci Quart.* **26**, 141–143.
135. H. T. Croft [1964], 'Lion and man': a postscript, *J. London Math. Soc.* **39**, 385–390.
136. D. W. Crowe [1956], The n-dimensional cube and the tower of Hanoi, *Amer. Math. Monthly* **63**, 29–30.
137. L. Csirmaz [1980], On a combinatorial game with an application to Go-Moku, *Discrete Math.* **29**, 19–23.
138. L. Csirmaz and Zs. Nagy [1979], On a generalization of the game Go-Moku, II, *Studia Scientiarum Math. Hung.* **14**, 461–469.
139. P. Cull and E. F. Ecklund, Jr. [1982], On the towers of Hanoi and generalized towers of Hanoi problems, *Congr. Numer.* **35**, 229–238.
140. P. Cull and E. F. Ecklund, Jr. [1985], Towers of Hanoi and analysis of algorithms, *Amer. Math. Monthly* **92**, 407–420.
141. P. Cull and C. Gerety [1985], Is towers of Hanoi really hard?, *Congr. Numer.* **47**, 237–242.
142. J. Czyzowicz, D. Mundici and A. Pelc [1988], Solution of Ulam's problem on binary search with two lies, *J. Combin. Theory* (Ser. A) **49**, 384–388.
143. J. Czyzowicz, D. Mundici and A. Pelc [1989], Ulam's searching game with lies, *J. Combin. Theory* (Ser. A) **52**, 62–76.
144. G. Danaraj and V. Klee [1977], The connectedness game and the c-complexity of certain graphs, *SIAM J. Appl. Math.* **32**, 431–442.
145. M. Davis [1963], Infinite games of perfect information, *Ann. of Math. Stud.* **52**, 85–101, Princeton.
146. T. R. Dawson [1934], *Fairy Chess Review* (problem 1603, p. 94, Dec.).
147. T. R. Dawson [1935], Caissa's Wild Roses, Reprinted in: *Five Classics of Fairy Chess*, Dover, 1973.
148. N. G. de Bruijn [1972], A solitaire game and its relation to a finite field, *J. Recr. Math.* **5**, 133–137.
149. N. G. de Bruijn [1981], Pretzel Solitaire as a pastime for the lonely mathematician, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 16–24.

150. F. de Carteblanche [1970], The princess and the roses, *J. Recr. Math.* **3**, 238–239.
151. F. deCarte Blanche [1974], The roses and the princes, *J. Recr. Math.* **7**, 295–298.
152. A. P. DeLoach [1971], Some investigations into the game of SIM, *J. Recr. Math.* **4**, 36–41.
153. H. de Parville [1884], La tour d'Hanoï et la question du Tonkin, *La Nature* **12**, 285–286.
154. B. Descartes [1953], Why are series musical? *Eureka* **16**, 18–20. Reprinted *ibid.* **27** (1964) 29–31.
155. A. K. Dewdney, Computer Recreations, a column in Scientific American (since May, 1984).
156. C. G. Diderich [1995], Bibliography on minimax game theory, sequential and purallel algorithms, http://diwww.epfl.ch/~diderich/bibliographies.html
157. R. Diestel and I. Leader [1994], Domination games on infinite graphs, *Theoret. Comput. Sci.* (*Math Games*) **132**, 337–345.
158. A. P. Domoryad [1964], *Mathematical Games and Pastimes* (translated by H. Moss), Pergamon Press, Oxford.
159. P. Duchet [1980], Graphes noyau-parfaits, in: *Ann. Discrete Math.* **9**, 93–101.
160. P. Duchet [1987], A sufficient condition for a digraph to be kernel-perfect, *J. Graph Theory* **11**, 81–85.
161. P. Duchet [1987], Parity graphs are kernel-M-solvable, *J. Combin. Theory* (Ser. B) **43**, 121–126.
162. P. Duchet and H. Meyniel [1981], A note on kernel-critical graphs, *Discrete Math.* **33**, 103–105.
163. P. Duchet and H. Meyniel [1983], Une généralisation du théorème de Richardson sur l'existence de noyaux dans le graphes orientés, *Discrete Math.* **43**, 21–27.
164. P. Duchet and H. Meyniel [1993], Kernels in directed graphs: a poison game, *Discrete Math.* **115**, 273–276.
165. H. E. Dudeney [1958], *The Canterbury Puzzles*, 4th ed., Mineola, NY.
166. H. E. Dudeney [1989], *Amusements in Mathematics*, reprinted by Dover, Mineola, NY.
167. N. Duvdevani and A. S. Fraenkel [1989], Properties of k-Welter's game, *Discrete Math.* **76**, 197–221.
168. J. Edmonds [1965], Lehman's switching game and a theorem of Tutte and Nash-Williams, *J. Res. Nat. Bur. Standards* **69B**, 73–77.
169. A. Ehrenfeucht and J. Mycielski [1979], Positional strategies for mean payoff games, *Internat. J. Game Theory* **8**, 109–113.

170. N. D. Elkies [1996], On numbers and endgames: combinatorial game theory in chess endgames, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

171. R. J. Epp and T. S. Ferguson [1980], A note on take-away games, *Fibonacci Quart.* **18**, 300–303.

172. R. A. Epstein [1977], *Theory of Gambling and Statistial Logic*, Academic Press, New York, NY.

173. M. C. Er [1982], A representation approach to the tower of Hanoi problem, *Comput. J.* **25**, 442–447.

174. M. C. Er [1983], An analysis of the generalized towers of Hanoi problem, *BIT* **23**, 429–435.

175. M. C. Er [1983], An iterative solution to the generalized towers of Hanoi problem, *BIT* **23**, 295–302.

176. M. C. Er [1984], A generalization of the cyclic towers of Hanoi, *Intern. J. Comput. Math.* **15**, 129–140.

177. M. C. Er [1984], The colour towers of Hanoi: a generalization, *Comput. J.* **27**, 80–82.

178. M. C. Er [1984], The cyclic towers of Hanoi: a representation approach, *Comput. J.* **27**, 171–175.

179. M. C. Er [1984], The generalized colour towers of Hanoi: an iterative algorithm, *Comput. J.* **27**, 278–282.

180. M. C. Er [1984], The generalized towers of Hanoi problem, *J. Inform. Optim. Sci.* **5**, 89–94.

181. M. C. Er [1985], The complexity of the generalized cyclic towers of Hanoi problem, *J. Algorithms* **6**, 351–358.

182. M. C. Er [1987], A general algorithm for finding a shortest path between two n-configurations, *Information Sciences* **42**, 137–141.

183. C. Erbas, S. Sarkeshik and M. M. Tanik [1992], Different perspectives of the N-queens problem, in: Proc. ACM Computer Science Conf., Kansas City, MO.

184. C. Erbas and M. M. Tanik [1994], Parallel memory allocation and data alignment in SIMD machines, *Parallel Algorithms and Applications* **4**, 139-151. Preliminary version appeared under the title: Storage schemes for parallel memory systems and the N-queens problem, in: Proc. 15th Ann. Energy Tech. Conf., Houston, TX, Amer. Soc. Mech. Eng., Vol. 43, 1992, pp. 115-120.

185. C. Erbas, M. M. Tanik and Z. Aliyazicioglu [1992], Linear conguence equations for the solutions of the N-queens problem, *Inform. Process. Lett.* **41**, 301–306.

186. P. Erdős and J. L. Selfridge [1973], On a combinatorial game, *J. Combin. Theory* (Ser. A) **14**, 298–301.

187. J. Erickson [1996], Sowing games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

188. J. Erickson [1996], New toads and frogs results, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

189. M. Erickson and F. Harary [1983], Picasso animal achievement games, *Bull. Malaysian Math. Soc.* **6**, 37–44.

190. H. Eriksson [1995], Pebblings, *Electronic J. Combin.* **2**, R7, 18pp., found at http://ejc.math.gatech.edu:8080/Journal/journalhome.html

191. H. Eriksson and B. Lindström [1995], Twin checker jumping, *European J. Combin.*

192. K. Eriksson [1991], No polynomial bound for the chip firing game on directed graphs, *Proc. Amer. Math. Soc.* **112**, 1203–1205.

193. K. Eriksson [1992], Convergence of Mozes' game of numbers, *Linear Algebra Appl.* **166**, 151–165.

194. K. Eriksson [1994], Node firing games on graphs, *Contemp. Math.* **178**, 117–127.

195. K. Eriksson [1994], Reachability is decidable in the numbers game, *Theoret. Comput. Sci.* (*Math Games*) **131**, 431–439.

196. K. Eriksson [1995], The numbers game and Coxeter groups, *Discrete Math.* **139**, 155–166.

197. R. J. Evans [1974], A winning opening in reverse Hex, *J. Recr. Math.* **7**, 189–192.

198. R. J. Evans [1975–76], Some variants of Hex, *J. Recr. Math.* **8**, 120–122.

199. R. J. Evans [1979], Silverman's game on intervals, *Amer. Math. Monthly* **86**, 277–281.

200. S. Even and R. E. Tarjan [1976], A combinatorial problem which is complete in polynomial space, *J. Assoc. Comput. Mach.* **23**, 710–719. Also appeared in Proc. 7th Ann. ACM Symp. Theory of Computing (Albuquerque, NM, 1975), Assoc. Comput. Mach., New York, NY, 1975, pp. 66–71.

201. E. Falkener [1961], *Games Ancient and Modern*, Dover, New York, NY. (Published previously by Longmans Green, 1897.)

202. B.-J. Falkowski and L. Schmitz [1986], A note on the queens' problem, *Inform. Process. Lett.* **23**, 39-46.

203. U. Feigle and W. Kern [1993], On the game chromatic number of some classes of graphs, *Ars Combin.* **35**, 143–150.

204. T. S. Ferguson [1974], On sums of graph games with last player losing, *Internat. J. Game Theory* **3**, 159–167.

205. T. S. Ferguson [1984], Misère annihilation games, *J. Combin. Theory* (Ser. A) **37**, 205–230.

206. T. S. Ferguson [1989], Who solved the secretary problem? *Statistical Science* **4**, 282–296.

207. T. S. Ferguson [1992], Mate with bishop and knight in kriegspiel, *Theoret. Comput. Sci.* (*Math Games*) **96**, 389–403.

208. A. S. Finbow and B. L. Hartnell [1983], A game related to covering by stars, *Ars Combinatoria* **16-A**, 189–198.

209. P. C. Fishburn and N. J. A. Sloane [1989], The solution to Berlekamp's switching game, *Discrete Math.* **74**, 263–290.

210. D. C. Fisher and J. Ryan [1992], Optimal strategies for a generalized "scissors, paper, and stone" game, *Amer. Math. Monthly* **99**, 935–942.

211. J. A. Flanigan [1978], Generalized two-pile Fibonacci nim, *Fibonacci Quart.* **16**, 459–469.

212. J. A. Flanigan [1981], On the distribution of winning moves in random game trees, *Bull. Austr. Math. Soc.* **24**, 227–237.

213. J. A. Flanigan [1981], Selective sums of loopy partizan graph games, *Internat. J. Game Theory* **10**, 1–10.

214. J. A. Flanigan [1982], A complete analysis of black-white Hackendot, *Internat. J. Game Theory* **11**, 21–25.

215. J. A. Flanigan [1982], One-pile time and size dependent take-away games, *Fibonacci Quart.* **20**, 51–59.

216. J. A. Flanigan [1983], Slow joins of loopy games, *J. Combin. Theory* (Ser. A) **34**, 46–59.

217. J. O. Flynn [1973], Lion and man: the boundary constraint, *SIAM J. Control* **11**, 397–411.

218. J. O. Flynn [1974], Some results on max-min pursuit, *SIAM J. Control* **12**, 53–69.

219. J. O. Flynn [1974], Lion and man: the general case, *SIAM J. Control* **12**, 581–597.

220. L. R. Foulds and D. G. Johnson [1984], An application of graph theory and integer programming: chessboard non-attacking puzzles, *Math. Mag.* **57**, 95–104.

221. A. S. Fraenkel [1974], Combinatorial games with an annihiliation rule, in: The Influence of Computing on Mathematical Research and Education, *Proc. Symp. Appl. Math.* (J. P. LaSalle, ed.), Vol. 20, Amer. Math. Soc., Providence, RI, pp. 87–91.

222. A. S. Fraenkel [1977], The particles and antiparticles game, *Comput. Math. Appl.* **3**, 327–328.

223. A. S. Fraenkel [1980], From Nim to Go, *Ann. Discrete Math.* **6**: Proc. Symp. on Combinatorial Mathematics, Combinatorial Designs and Their Applications (J. Srivastava, ed.), Colorado State Univ., Fort Collins, CO, June 1978, pp. 137–156.

224. A. S. Fraenkel [1981], Planar kernel and Grundy with $d \leq 3$, $d_{out} \leq 2$, $d_{in} \leq 2$ are NP-complete, *Discrete Appl. Math.* **3**, 257–262.

225. A. S. Fraenkel [1982], How to beat your Wythoff games' opponents on three fronts, *Amer. Math. Monthly* **89**, 353–361.

226. A. S. Fraenkel [1983], 15 Research problems on games, in: "Research Problems", *Discrete Math.* **43–46**.

227. A. S. Fraenkel [1984], Wythoff games, continued fractions, cedar trees and Fibonacci searches, *Theoret. Comput. Sci.* **29**, 49–73. An earlier version appeared in Proc. 10th Internat. Colloq. on Automata, Languages and Programming (J. Diaz, ed.), Barcelona, July 1983, *Lecture Notes in Computer Science* **154**, 203–225, Springer Verlag, Berlin, 1983.

228. A. S. Fraenkel [1991], Complexity of games, in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 111–153.

229. A. S. Fraenkel [1994], Even kernels, *Electronic J. Combinatorics* **1**, R5, 13pp. http://ejc.math.gatech.edu:8080/Journal/Volume_1/volume1.html

230. A. S. Fraenkel [1994], Recreation and depth in combinatorial games, in: The Lighter Side of Mathematics, Proc. E. Strens Memorial Conf. on Recr. Math. and its History (R. K. Guy and R. E. Woodrow, eds.), Calgary, 1986, Spectrum Series, Math. Assoc. of America, Washington, D. C., pp. 159–173.

231. A. S. Fraenkel [1996], Error-correcting codes derived from combinatorial games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

232. A. S. Fraenkel [1996], Scenic trails ascending from sea-level Nim to alpine chess, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

233. A. S. Fraenkel and I. Borosh [1973], A generalization of Wythoff's game, *J. Combin. Theory* (Ser. A) **15**, 175–191.

234. A. S. Fraenkel, M. R. Garey, D. S. Johnson, T. Schaefer and Y. Yesha [1978], The complexity of checkers on an $n \times n$ board — preliminary report, Proc. 19th Ann. Symp. Foundations of Computer Science (Ann Arbor, MI, Oct. 1978), IEEE Computer Soc., Long Beach, CA, pp. 55–64.

235. A. S. Fraenkel and E. Goldschmidt [1987], Pspace-hardness of some combinatorial games, *J. Combin. Theory* (Ser. A) **46**, 21–38.

236. A. S. Fraenkel and F. Harary [1989], Geodetic contraction games on graphs, *Internat. J. Game Theory* **18**, 327–338.

237. A. S. Fraenkel and H. Herda [1980], Never rush to be first in playing Nimbi, *Math. Mag.* **53**, 21–26.

238. A. S. Fraenkel, A. Jaffray, A. Kotzig and G. Sabidussi [1995], Modular Nim, *Theoret. Comput. Sci.* (*Math Games*) **143**, 319–333.

239. A. S. Fraenkel and A. Kotzig [1987], Partizan octal games: partizan subtraction games, *Internat. J. Game Theory* **16**, 145–154.

240. A. S. Fraenkel and D. Lichtenstein [1981], Computing a perfect strategy for $n \times n$ chess requires time exponential in n, *J. Combin. Theory* (Ser. A) **31**, 199–214. Preliminary version in Proc. 8th Internat. Colloq. Automata, Languages and Programming (S. Even and O. Kariv, eds.), Acre, Israel, 1981, *Lecture Notes in Computer Science* **115**, 278–293, Springer Verlag, Berlin.

241. A. S. Fraenkel, M. Loebl and J. Nešetřil [1988], Epidemiography, II. Games with a dozing yet winning player, *J. Combin. Theory* (Ser. A) **49**, 129–144.

242. A. S. Fraenkel and M. Lorberbom [1989], Epidemiography with various growth functions, *Discrete Appl. Math.* **25**, 53–71.

243. A. S. Fraenkel and M. Lorberbom [1991], Nimhoff games, *J. Combin. Theory* (Ser. A) **58**, 1–25.

244. A. S. Fraenkel and J. Nešetřil [1985], Epidemiography, *Pacific J. Math.* **118**, 369–381.

245. A. S. Fraenkel and Y. Perl [1975], Constructions in combinatorial games with cycles, *Coll. Math. Soc. János Bolyai*, **10**: Proc. Internat. Colloq. on Infinite and Finite Sets, Vol. 2 (A. Hajnal, R. Rado and V. T. Sós, eds.) Keszthely, Hungary, 1973, North-Holland, pp. 667–699.

246. A. S. Fraenkel and E. R. Scheinerman [1991], A deletion game on hypergraphs, *Discrete Appl. Math.* **30**, 155–162.

247. A. S. Fraenkel, E. R. Scheinerman and D. Ullman [1993], Undirected edge geography, *Theoret. Comput. Sci.* (*Math Games*) **112**, 371–381.

248. A. S. Fraenkel and S. Simonson [1993], Geography, *Theoret. Comput. Sci.* (*Math Games*) **110**, 197–214.

249. A. S. Fraenkel and U. Tassa [1975], Strategy for a class of games with dynamic ties, *Comput. Math. Appl.* **1**, 237–254.

250. A. S. Fraenkel and U. Tassa [1982], Strategies for compounds of partizan games, *Math. Proc. Camb. Phil. Soc.* **92**, 193–204.

251. A. S. Fraenkel, U. Tassa and Y. Yesha [1978], Three annihilation games, *Math. Mag.* **51**, 13–17.

252. A. S. Fraenkel and Y. Yesha [1976], Theory of annihilation games, *Bull. Amer. Math. Soc.* **82**, 775–777.

253. A. S. Fraenkel and Y. Yesha [1979], Complexity of problems in games, graphs and algebraic equations, *Discrete Appl. Math.* **1**, 15–30.

254. A. S. Fraenkel and Y. Yesha [1982], Theory of annihilation games — I, *J. Combin. Theory* (Ser. B) **33**, 60–86.

255. A. S. Fraenkel and Y. Yesha [1986], The generalized Sprague-Grundy function and its invariance under certain mappings, *J. Combin. Theory* (Ser. A) **43**, 165–177.

256. C. N. Frangakis [1981], A backtracking algorithm to generate all kernels of a directed graph, *Intern. J. Comput. Math.* **10**, 35–41.

257. P. Frankl [1987], Cops and robbers in graphs with large girth and Cayley graphs, *Discrete Appl. Math.* **17**, 301–305.

258. P. Frankl [1987], On a pursuit game on Cayley graphs, *Combinatorica* **7**, 67–70.

259. D. Fremlin [1973], Well-founded games, *Eureka* **36**, 33–37.

260. G. H. Fricke, S. M. Hedetniemi, S. T. Hedetniemi, A. A. McRae, C. K. Wallis, M. S. Jacobson, H. W. Martin and W. D. Weakley [1995], Combinatorial problems on chessboards: a brief survey, in: Graph Theory, Combinatorics, and Applications: Proc. 7th Quadrennial Internat. Conf. on the Theory and Applications of Graphs, Vol. 1 (Y. Alavi and A. Schwenk, Eds., Wiley), pp. 507–528.

261. Z. Füredi and Á. Seress [1994], Maximal triangle-free graphs with restrictions on the degrees, *J. Graph Theory* **18**, 11–24.

262. D. Gale [1974], A curious Nim-type game, *Amer. Math. Monthly* **81**, 876–879.

263. D. Gale [1979], The game of Hex and the Brouwer fixed-point theorem, *Amer. Math. Monthly* **86**, 818–827.

264. D. Gale [1986], Problem 1237 (line-drawing game), *Math. Mag.* **59**, 111. Solution by J. Hutchinson and S. Wagon, *ibid.* **60** (1987) 116.

265. D. Gale and A. Neyman [1982], Nim-type games, *Internat. J. Game Theory* **11**, 17–20.

266. D. Gale and F. M. Stewart [1953], Infinite games with perfect information, Contributions to the Theory of Games vol. 2, *Ann. of Math. Stud.* **28**, 245–266, Princeton.

267. H. Galeana-Sánchez [1982], A counterexample to a conjecture of Meyniel on kernel-perfect graphs, *Discrete Math.* **41**, 105–107.

268. H. Galeana-Sánchez [1986], A theorem about a conjecture of Meyniel on kernel-perfect graphs, *Discrete Math.* **59**, 35–41.

269. H. Galeana-Sánchez [1995], B_1 and B_2-orientable graphs in kernel theory, *Discrete Math.* **143**, 269–274.

270. H. Galeana-Sánchez and V. Neuman-Lara [1984], On kernels and semikernels of digraphs, *Discrete Math.* **48**, 67–76.

271. H. Galeana-Sánchez and V. Neuman-Lara [1994], New extensions of kernel perfect digraphs to kernel imperfect critical digraphs, *Graphs Combin.* **10**, 329–336.
272. F. Galvin [1978], Indeterminacy of point-open games. *Bull. de l'Academie Polonaise des Sciences* (math., astr. et phys.) **26**, 445–449.
273. A. Gangolli and T. Plambeck [1989], A note on periodicity in some octal games, *Internat. J. Game Theory* **18**, 311–320.
274. T. E. Gantner [1988], The game of Quatrainment, *Math. Mag.* **61**, 29–34.
275. M. Gardner [1956], *Mathematics, Magic and Mystery*, Dover, New York, NY.
276. M. Gardner, Mathematical Games, a column in Scientific American (Jan. 1957–Dec. 1981).
277. M. Gardner [1959], *Mathematical Puzzles of Sam Loyd*, Dover, New York, NY.
278. M. Gardner [1960], *More Mathematical Puzzles of Sam Loyd*, Dover, New York, NY.
279. M. Gardner [1961], *The Second Scientific American Book of Mathematical Puzzles and Diversions*, Simon and Schuster, NY.
280. M. Gardner [1966], *New Mathematical Diversions from Scientific American*, Simon and Schuster, New York, NY.
281. M. Gardner [1967], *536 Puzzles and Curious Problems* (edited; reissue of H. E. Dudeney's *Modern Puzzles* and *Puzzles and Curious Problems*), Scribner's, NY.
282. M. Gardner [1969], *The Unexpected Hanging and Other Mathematical Diversions*, Simon and Schuster, NY.
283. M. Gardner [1975], *Mathematical Carnival*, Knopf, NY.
284. M. Gardner [1977], *Mathematical Magic Show*, Knopf, NY.
285. M. Gardner [1978], *Aha! Insight*, Freeman, New York, NY.
286. M. Gardner [1979], *Mathematical Circus*, Knopf, NY.
287. M. Gardner [1981], *Science Fiction Puzzle Tales*, Potter.
288. M. Gardner [1982], *Aha! Gotcha!*, Freeman, New York, NY.
289. M. Gardner [1984], *Puzzles from Other Worlds*, Random House.
290. M. Gardner [1984], *The Magic Numbers of Dr. Matrix*, Prometheus.
291. M. Gardner [1984], *The Sixth Book of Mathematical Games*, Univ. of Chicago Press (first appeared in 1971 by Freeman).
292. M. Gardner [1984], *Wheels, Life and Other Mathematical Amusements*, Freeman, New York, NY.
293. M. Gardner [1986], *Knotted Doughnuts and Other Mathematical Entertainments*, Freeman, New York, NY.
294. M. Gardner [1987], *Riddles of the Sphinx*, Math. Assoc. of America.

295. M. Gardner [1987], *Time Travel and Other Mathematical Bewilderments*, Freeman, New York, NY.

296. M. Gardner [1988], *Hexaflexagons and Other Mathematical Diversions*, University of Chicago Press, Chicago, 1988. A first version appeared under the title *The Scientific American Book of Mathematical Puzzles and Diversions*, Simon & Schuster, 1959, NY.

297. M. Gardner [1989], *Penrose Tiles to Trapdoor Ciphers*, Freeman, New York, NY.

298. M. Gardner [1991], *Fractal Music, Hypercards and More*, Freeman, New York, NY.

299. M. R. Garey and D. S. Johnson [1979], *Computers and Intractability: A Guide to the theory of NP-Completeness*, Freeman, San Francisco (Appendix, A8).

300. R. Gasser [1996), Solving nine men's Morris, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

301. J. R. Gilbert, T. Lengauer and R. E. Tarjan [1980], The pebbling problem is complete in polynomial space, *SIAM J. Comput.* **9**, 513–524. Preliminary version in Proc. 11th Ann. ACM Symp. Theory of Computing (Atlanta, GA, 1979), Assoc. Comput. Mach., New York, NY, pp. 237–248.

302. J. Ginsburg [1939], Gauss's arithmetization of the problem of 8 queens, *Scripta Math.* **5**, 63–66.

303. A. S. Goldstein and E. M. Reingold [1995], The complexity of pursuit on a graph, *Theoret. Comput. Sci.* (*Math Games*) **143**, 93–112.

304. E. Goles and M. A. Kiwi [1993], Games on line graphs and sand piles, *Theoret. Comput. Sci.* (*Math Games*) **115**, 321–349.

305. S. W. Golomb [1966], A mathematical investigation of games of "take-away", *J. Combin. Theory* **1**, 443–458.

306. S. W. Golomb [1994], *Polyominoes: Puzzles, Patterns, Problems, and Packings*, Princeton University Press. Original edition: *Polyominoes*, Scribner's, NY, 1965; Allen and Unwin, London, 1965.

307. D. M. Gordon, R. W. Robinson and F. Harary [1994], Minimum degree games for graphs, *Discrete Math.* **128**, 151–163.

308. E. Grädel [1990], Domino games and complexity, *SIAM J. Comput.* **19**, 787–804.

309. S. B. Grantham [1985], Galvin's "racing pawns" game and a well-ordering of trees, *Memoirs Amer. Math. Soc.* **53**(316), 63 pp.

310. P. M. Grundy [1964], Mathematics and Games, *Eureka* **27**, 9–11; originally published: *ibid.* **2** (1939), 6–8.

311. P. M. Grundy, R. S. Scorer and C. A. B. Smith [1944], Some binary games, *Math. Gaz.* **28**, 96–103.

312. P. M. Grundy and C. A. B. Smith [1956], Disjunctive games with the last player losing, *Proc. Camb. Phil. Soc.* **52**, 527–533.

313. F. Grunfeld and R. C. Bell [1975], *Games of the World*, Holt, Rinehart and Winston.

314. C. D. Grupp [1976], *Brettspiele-Denkspiele*, Humboldt-Taschenbuchverlag, München.

315. S. Gunther [1874], Zur mathematischen Theorie des Schachbretts, *Arch. Math. Physik* **56**, 281–292.

316. R. K. Guy [1976], Packing $[1, n]$ with solutions of $ax + by = cz$; the unity of combinatorics, *Atti Conv. Lincei* #17, *Accad. Naz. Lincei* Rome, Tomo II, 173–179.

317. R. K. Guy [1976], Twenty questions concerning Conway's sylver coinage, *Amer. Math. Monthly* **83**, 634–637.

318. R. K. Guy [1977], Games are graphs, indeed they are trees, *Proc. 2nd Carib. Conf. Combin. and Comput.*, Letchworth Press, Barbados, 6–18.

319. R. K. Guy [1977], She loves me, she loves me not; relatives of two games of Lenstra, *Een Pak met een Korte Broek* (papers presented to H. W. Lenstra), Mathematisch Centrum, Amsterdam.

320. R. K. Guy [1978], Partizan and impartial combinatorial games, *Colloq. Math. Soc. János Bolyai*, **18**: Proc. 5th Hungar. Conf. Combin., Vol. I (A. Hajnal and V. T. Sós, eds.), Keszthely, Hungary, 1976, North-Holland, pp. 437–461.

321. R. K. Guy [1979], Partizan Games, Colloques Internationaux C. N. R. No. 260 — Problèmes Combinatoires et Théorie des Graphs, 199–205.

322. R. K. Guy [1981], Anyone for twopins?, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 2–15.

323. R. K. Guy [1983], Graphs and games, in: *Selected Topics in Graph Theory*, 2 (L. W. Beineke and R. J. Wilson, eds.), Academic Press, London, pp. 269–295.

324. R. K. Guy [1986], John Isbell's game of beanstalk and John Conway's game of beans-don't-talk, *Math. Mag.* **59**, 259–269.

325. R. K. Guy [1989], *Fair Game*, COMAP Math. Exploration Series, Arlington, MA.

326. R. K. Guy [1990], A guessing game of Bill Sands, and Bernardo Recamán's Barranca, *Amer. Math. Monthly* **97**, 314–315.

327. R. K. Guy [1991], Mathematics from fun & fun from mathematics; an informal autobiographical history of combinatorial games, in: *Paul Halmos: Celebrating 50 Years of Mathematics* (J. H. Ewing and F. W. Gehring, eds.), Springer Verlag, New York, pp. 287–295.

328. R. K. Guy [1996], Combinatorial games, in: *Handbook of Combinatorics* (R. L. Graham, M. Grötschel and L. Lovász, eds.), Vol. II, pp. 2117-2162, North-Holland, Amsterdam.

329. R. K. Guy [1996], Impartial Games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX. Earlier version in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 35–55, 1991.

330. R. K. Guy [1996], What is a game? in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX. Earlier version in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 1–21, 1991.

331. R. K. Guy [1996], Unsolved problems in combinatorial games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX. Update with 52 problems of earlier version with 37 problems, in: *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 183–189, 1991.

332. R. K. Guy and C. A. B. Smith [1956], The G-values of various games, *Proc. Camb. Phil. Soc.* **52**, 514–526.

333. R. K. Guy and R. E. Woodrow, eds. [1994], *The Lighter Side of Mathematics*, Proc. E. Strens Memorial Conf. on Recreational Mathematics and its History, Spectrum Series, Math. Assoc. Amer., Washington, DC.

334. W. Guzicki [1990], Ulam's searching game with two lies, *J. Combin. Theory* (Ser. A) **54**, 1–19.

335. D. R. Hale [1983], A variant of Nim and a function defined by Fibonacci representation, *Fibonacci Quart.* **21**, 139–142.

336. A. W. Hales and R. I. Jewett [1963], Regularity and positional games, *Trans. Amer. Math. Soc.* **106**, 222–229.

337. L. Halpenny and C. Smyth [1992], A classification of minimal standard-path 2×2 switching networks, *Theoret. Comput. Sci.* (*Math Games*) **102**, 329–354.

338. Y. O. Hamidoune [1987], On a pursuit game of Cayley digraphs, *Europ. J. Combin.* **8**, 289–295.

339. Y. O. Hamidoune and M. Las Vergnas [1985], The directed Shannon switching game and the one-way game, in: *Graph Theory and Its Applications to Algorithms and Computer Science* (Y. Alavi et al., eds.), Wiley, pp. 391–400.

340. Y. O. Hamidoune and M. Las Vergnas [1986], Directed switching games on graphs and matroids, *J. Combin. Theory* (Ser. B) **40**, 237–269.

341. Y. O. Hamidoune and M. Las Vergnas [1987], A solution to the box game, *Discrete Math.* **65**, 157–171.

342. Y. O. Hamidoune and M. Las Vergnas [1988], A solution to the misère Shannon switching game, *Discrete Math.* **72**, 163–166.

343. O. Hanner [1959], Mean play of sums of positional games, *Pacific J. Math.* **9**, 81–99.

344. F. Harary [1982], Achievement and avoidance games for graphs, *Ann. Discrete Math.* **13**, 111–120.

345. F. Harary and K. Plochinski [1987], On degree achievement and avoidance games for graphs, *Math. Mag.* **60**, 316–321.

346. P. J. Hayes [1977], A note on the towers of Hanoi problem, *Computer J.* **20**, 282–285.

347. O. Heden [1992], On the modular n-queen problem, *Discrete Math.* **102**, 155–161.

348. O. Heden [1993], Maximal partial spreads and the modular n-queen problem, *Discrete Math.* **120**, 75–91.

349. O. Heden [1995], Maximal partial spreads and the modular n-queen problem II, *Discrete Math.* **142**, 97–106.

350. P. Hein [1942], Polygon, *Politiken* (description of Hex in this Danish newspaper of Dec. 26).

351. D. Hensley [1988], A winning strategy at Taxman, *Fibonacci Quart.* **26**, 262–270.

352. C. W. Henson [1970], Winning strategies for the ideal game, *Amer. Math. Monthly* **77**, 836–840.

353. G. A. Heuer [1982], Odds versus evens in Silverman-type games, *Internat. J. Game Theory* **11**, 183–194.

354. G. A. Heuer [1989], Reduction of Silverman-like games to games on bounded sets, *Internat. J. Game Theory* **18**, 31–36.

355. G. A. Heuer and W. D. Rieder [1988], Silverman games on disjoint discrete sets, *SIAM J. Disc. Math.* **1**, 485–525.

356. R. Hill and J. P. Karim [1992], Searching with lies: the Ulam problem, *Discrete Math.* **106/107**, 273–283.

357. T. P. Hill and U. Krengel [1991], Minimax-optimal stop rules and distributions in secretary problems, *Ann. Probab.* **19**, 342–353.

358. T. P. Hill and U. Krengel [1992], On the game of Googol, *Internat. J. Game Theory* **21**, 151–160.

359. P. G. Hinman [1972], Finite termination games with tie, *Israel J. Math.* **12**, 17–22.

360. A. M. Hinz [1989], An iterative algorithm for the tower of Hanoi with four pegs, *Computing* **42**, 133–140.

361. A. M. Hinz [1989], The tower of Hanoi, *Enseign. Math.* **35**, 289–321.

362. A. M. Hinz [1992], Pascal's triangle and the tower of Hanoi, *Amer. Math. Monthly* **99**, 538–544.

363. A. M. Hinz [1992], Shortest paths between regular states of the tower of Hanoi, *Inform. Sci.* **63**, 173–181.

364. S. Hitotumatu [1968], Some remarks on nim-like games, *Comment. Math. Univ. St. Paul* **17**, 85–98.

365. E. J. Hoffman, J. C. Loessi and R. C. Moore [1969], Construction for the solution of the n-queens problem, *Math. Mag.* **42**, 66–72.

366. J. C. Holladay [1957], Cartesian products of termination games, Contributions to the Theory of Games vol. 3, *Ann. of Math. Stud.* **39**, 189–200, Princeton.

367. J. C. Holladay [1958], Matrix nim, *Amer. Math. Monthly* **65**, 107–109.

368. J. C. Holladay [1966], A note on the game of dots, *Amer. Math. Monthly* **73**, 717–720.

369. K. Igusa [1985], Solution of the Bulgarian solitaire conjecture, *Math. Mag.* **58**, 259–271.

370. J. Isbell [1992], The Gordon game of a finite group, *Amer. Math. Monthly* **99**, 567–569.

371. O. Itzinger [1977], The South American game, *Math. Mag.* **50**, 17–21.

372. S. Iwata and T. Kasai [1994], The Othello game on an $n \times n$ board is PSPACE-complete, *Theoret. Comput. Sci.* (*Math Games*) **123**, 329–340.

373. T. A. Jenkyns and J. P. Mayberry [1980], The skeleton of an impartial game and the Nim-function of Moore's Nim_k, *Internat. J. Game Theory* **9**, 51–63.

374. D. S. Johnson [1983], The NP-Completeness Column: An Ongoing Guide, *J. Algorithms* **4**, 397–411 (9th quarterly column (games); column started in 1981).

375. J. P. Jones [1982], Some undecidable determined games, *Internat. J. Game Theory* **11**, 63–70.

376. J. P. Jones and A. S. Fraenkel [1996], Complexities of winning strategies in diophantine games, *J. Complexity* **11**, 435-455.

377. M. Kac [1974], Hugo Steinhaus, a reminiscence and a tribute, *Amer. Math. Monthly* **81**, 572–581 (p. 577).

378. J. Kahane and A. S. Fraenkel [1987], k-Welter — a generalization of Welter's game, *J. Combin. Theory* (Ser. A) **46**, 1–20.

379. J. Kahn, J. C. Lagarias and H. S. Witsenhausen [1987], Single-suit two-person card play, *Internat. J. Game Theory* **16**, 291–320.

380. J. Kahn, J. C. Lagarias and H. S. Witsenhausen [1988], Single-suit two-person card play, II. Dominance, *Order* **5**, 45–60.

381. J. Kahn, J. C. Lagarias and H. S. Witsenhausen [1989], Single-suit two-person card play, III. The misère game, *SIAM J. Disc. Math.* **2**, 329–343.

382. J. Kahn, J. C. Lagarias and H. S. Witsenhausen [1989], On Lasker's card game, in: Differential games and applications (T. S. Başar, P. Bernhard, eds.), *Lecture Notes in Control and Information Sciences* **119**, 1–8, Springer Verlag, Berlin.

383. L. Kalmár [1928], Zur Theorie der abstrakten Spiele, *Acta Sci. Math. Univ. Szeged* **4**, 65–85.

384. B. Kalyanasundram [1991], On the power of white pebbles, *Combinatorica* **11**, 157–171.

385. B. Kalyanasundram and G. Schnitger [1988], On the power of white pebbles, Proc. 20th Ann. ACM Symp. Theory of Computing (Chicago, IL, 1988), Assoc. Comput. Mach., New York, NY, pp. 258–266.

386. M. Kano [1983], Cycle games and cycle cut games, *Combinatorica* **3**, 201–206.

387. R. M. Karp and Y. Zhang [1989], On parallel evaluation of game trees, Proc. ACM Symp. Parallel Algorithms and Architectures, 409–420.

388. T. Kasai, A. Adachi and S. Iwata [1979], Classes of pebble games and complete problems, *SIAM J. Comput.* **8**, 574–586.

389. Y. Kawano [1996], Using similar positions to search game trees, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

390. J. C. Kenyon [1967], A Nim-like game with period 349, Univ. of Calgary, Math. Dept. Res. Paper No. 13.

391. J. C. Kenyon [1967], Nim-like games and the Sprague-Grundy theory, M. Sc. Thesis, Univ. of Calgary.

392. B. Kerst [1933], *Mathematische Spiele*, Reprinted by Dr. Martin Sǎndig oHG, Wiesbaden 1968.

393. Y. Kim [$\geq$1996], New values in domineering, to appear in *Theoret. Comput. Sci.* (*Math Games*).

394. H. Kinder [1973], Gewinnstrategien des Anziehenden in einigen Spielen auf Graphen, *Arch. Math.* **24**, 332–336.

395. M. M. Klawe [1985], A tight bound for black and white pebbles on the pyramids, *J. Assoc. Comput. Mach.* **32**, 218–228.

396. C. S. Klein and S. Minker [1993], The super towers of Hanoi problem: large rings on small rings, *Discrete Math.* **114**, 283–295.

397. D. J. Kleitman and B. L. Rothschild [1972], A generalization of Kaplansky's game, *Discrete Math.* **2**, 173–178.

398. T. Kløve [1977], The modular n-queen problem, *Discrete Math.* **19**, 289–291.

399. T. Kløve [1981], The modular n-queen problem II, *Discrete Math.* **36**, 33–48.

400. D. E. Knuth [1974], *Surreal Numbers*, Addison-Wesley, Reading, MA.

401. D. E. Knuth [1976], The computer as Master Mind, *J. Recr. Math.* **9**, 1–6.

402. A. Kotzig [1946], O k-posunutiach (On k-translations; in Slovakian), *Časop. pro Pěst. Mat. a Fys.* **71**, 55–61. Extended abstract in French, pp. 62–66.

403. G. Kowalewski [1930], *Alte und neue mathematische Spiele*, Reprinted by Dr. Martin Săndig oHG, Wiesbaden 1968.

404. K. Koyama and T. W. Lai [1993], An optimal Mastermind strategy, *J. Recr. Math.* **25**, 251–256.

405. M. Kraitchik [1953], *Mathematical Recreations*, 2nd ed., Dover, New York, NY.

406. B. Kummer [1980], *Spiele auf Graphen*, Internat. Series of Numerical Mathematics, Birkhäuser Verlag, Basel.

407. R. E. Ladner and J. K. Norman [1985], Solitaire automata, *J. Comput. System Sci.* **30**, 116–129.

408. J. C. Lagarias [1977], Discrete balancing games, *Bull. Inst. Math. Acad. Sinica* **5**, 363-373.

409. S. P. Lalley [1988], A one-dimensional infiltration game, *Naval Research Logistics* **35**, 441–446.

410. H. A. Landman [1996], Eyespace values in Go, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

411. L. Larson [1977], A theorem about primes proved on a chessboard, *Math. Mag.* **50**, 69–74.

412. E. Lasker [1931], *Brettspiele der Völker, Rätsel und mathematische Spiele*, Berlin.

413. I. Lavalée [1985], Note sur le problème des tours d'Hanoï, *Rev. Roumaine Math. Pures Appl.* **30**, 433–438.

414. A. J. Lazarus, D. E. Loeb, J. G. Propp and D. Ullman [1996], Richman Games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

415. A. Lehman [1964], A solution to the Shannon switching game, *SIAM J. Appl. Math.* **12**, 687–725.

416. T. Lengauer and R. Tarjan [1980], The space complexity of pebble games on trees, *Inform. Process. Lett.* **10**, 184–188.

417. T. Lengauer and R. Tarjan [1982], Asymptotically tight bounds on time-space trade-offs in a pebble game, *J. Assoc. Comput. Mach.* **29**, 1087–1130.
418. H. W. Lenstra, Jr. [1977], On the algebraic closure of two, *Proc. Kon. Nederl. Akad. Wetensch.* (Ser. A) **80**, 389–396.
419. H. W. Lenstra, Jr. [1977/1978], Nim multiplication, Séminaire de Théorie des Nombres, No. 11, Université de Bordeaux, France.
420. D. N. L. Levy, Editor [1988], *Computer Games I, II*, Springer-Verlag, New York.
421. J. Lewin [1986], The lion and man problem revisited, *J. Optimization Theory and Applications* **49**, 411–430.
422. S.-Y. R. Li [1974], Generalized impartial games, *Internat. J. Game Theory* **3**, 169–184.
423. S.-Y. R. Li [1976], Sums of Zuchswang games, *J. Combin. Theory* (Ser. A) **21**, 52–67.
424. S.-Y. R. Li [1977], N-person nim and N-person Moore's games, *Internat. J. Game Theory* **7**, 31–36.
425. D. Lichtenstein, [1982], Planar formulae and their uses, *SIAM J. Comput.* **11**, 329–343.
426. D. Lichtenstein and M. Sipser [1980], Go is Polynomial-Space hard, *J. Assoc. Comput. Mach.* **27**, 393–401. Earlier draft appeared in Proc. 19th Ann. Symp. Foundations of Computer Science (Ann Arbor, MI, Oct. 1978), IEEE Computer Soc., Long Beach, CA, 1978, pp. 48–54.
427. D. E. Loeb [1996], Stable winning coalitions, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
428. A. M. Lopez, Jr. [1991], A prolog Mastermind program, *J. Recr. Math.* **23**, 81–93.
429. S. Loyd [1914], *Cyclopedia of Puzzles and Tricks*, Franklin Bigelow Corporation, Morningside Press, NY. Reissued and edited by M. Gardner under the name *The Mathematical Puzzles of Sam Loyd* (two volumes), Dover, New York, NY, 1959.
430. X. Lu [1991], A matching game, *Discrete Math.* **94**, 199–207.
431. X. Lu [1992], Hamiltonian games, *J. Combin. Theory* (Ser. B) **55**, 18–32.
432. X. Lu [1995], A Hamiltonian game on $K_{n,n}$, *Discrete Math.* **142**, 185–191.
433. X.-M. Lu [1986], Towers of Hanoi graphs, *Intern. J. Comput. Math.* **19**, 23–38.
434. X.-M. Lu [1988], Towers of Hanoi problem with arbitrary $k \geq 3$ pegs, *Intern. J. Comput. Math.* **24**, 39–54.
435. X.-M. Lu [1989], An iterative solution for the 4-peg towers of Hanoi, *Comput. J.* **32**, 187–189.

436. É. Lucas [1960], *Récréations Mathématiques* (four volumes), A. Blanchard, Paris. Previous editions: Gauthier-Villars, Paris, 1891–1894.

437. É. Lucas [1974], *Introduction aux Récréations Mathématiques: L'Arithmétique Amusante*, reprinted by A. Blanchard, Paris. Originally published by A. Blanchard, Paris, 1895.

438. A. L. Ludington [1988], Length of the 7-number game, *Fibonacci Quart.* **26**, 195–204.

439. A. Ludington-Young [1990], Length of the n-number game, *Fibonacci Quart.* **28**, 259–265.

440. M. Maamoun and H. Meyniel [1987], On a game of policemen and robber, *Discrete Appl. Math.* **17**, 307–309.

441. P. A. MacMahon [1921], *New Mathematical Pastimes*, Cambridge University Press, Cambridge.

442. F. Maffray [1986], On kernels in i-triangulated graphs, *Discrete Math.* **61**, 247–251.

443. F. Maffray [1992], Kernels in perfect line-graphs, *J. Combin. Theory* (Ser. B) **55**, 1–8.

444. G. Martin [1991], *Polyominoes: Puzzles and Problems in Tiling*, Math. Assoc. America, Wasington, DC.

445. J. G. Mauldon [1978], Num, a variant of nim with no first player win, *Amer. Math. Monthly* **85**, 575–578.

446. D. P. McIntyre [1942], A new system for playing the game of nim, *Amer. Math. Monthly* **49**, 44–46.

447. E. Mead, A. Rosa and C. Huang [1974], The game of SIM: A winning strategy for the second player, *Math. Mag.* **47**, 243–247.

448. N. Megiddo, S. L. Hakimi, M. R. Garey, D. S. Johnson and C. H. Papadimitriou [1988], The complexity of searching a graph, *J. Assoc. Comput. Mach.* **35**, 18–44.

449. K. Mehlhorn, S. Näher and M. Rauch [1990], On the complexity of a game related to the dictionary problem, *SIAM J. Comput.* **19**, 902–906. Earlier draft appeared in Proc. 30th Ann. Symp. Foundations of Computer Science, pp. 546–548.

450. N. S. Mendelsohn [1946], A psychological game, *Amer. Math. Monthly* **53**, 86–88.

451. C. G. Méndez [1981], On the law of large numbers, infinite games and category, *Amer. Math. Monthly* **88**, 40–42.

452. D. Mey [1994], Finite games for a predicate logic without contractions, *Theoret. Comput. Sci.* (*Math Games*) **123**, 341–349.

453. F. Meyer auf der Heide [1981], A comparison of two variations of a pebble game on graphs, *Theoret. Comput. Sci.* **13**, 315–322.

454. H. Meyniel and J.-P. Roudneff [1988], The vertex picking game and a variation of the game of dots and boxes, *Discrete Math.* **70**, 311–313.

455. D. Michie and I. Bratko [1987], Ideas on knowledge synthesis stemming from the KBBKN endgame, *Internat. Comp. Chess Assoc. J.* **10**, 3–10.

456. J. Milnor [1953], Sums of positional games, Contributions to the Theory of Games vol. 2 (H. W. Kuhn and A. W. Tucker, eds.), *Ann. of Math. Stud.* **28**, 291–301, Princeton.

457. P.-Min Lin [1982], Principal partition of graphs and connectivity games, *J. Franklin Inst.* **314**, 203–210.

458. S. Minsker [1989], The towers of Hanoi rainbow problem: coloring the rings, *J. Algorithms* **10**, 1–19.

459. S. Minsker [1991], The towers of Antwerpen problem, *Inform. Process. Lett.* **38**, 107–111.

460. D. Moews [1991], Sum of games born on days 2 and 3, *Theoret. Comput. Sci.* (*Math Games*) **91**, 119–128.

461. D. Moews [1992], Pebbling graphs, *J. Combin. Theory* (Ser. B) **55**, 244–252.

462. D. Moews [1996], Infinitesimals and coin-sliding, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

463. D. Moews [1996], Loopy games and Go, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

464. D. Moews [$\geq$1996], Coin-sliding and Go, to appear in *Theoret. Comput. Sci.* (*Math Games*).

465. E. H. Moore [1909–1910], A generalization of the game called nim, *Ann. of Math.* **11** (Ser. 2), 93–94.

466. F. L. Morris [1981], Playing disjunctive sums is polynomial space complete, *Internat. J. Game Theory* **10**, 195–205.

467. M. Müller and R. Gasser [1996], Experiments in computer Go endgames, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

468. H. J. R. Murray [1952], *A History of Board Games Other Than Chess*, Oxford University Press.

469. B. Nadel [1990], Representation selection for constraint satisfaction: a case study using n-queens, *IEEE Expert*, 16–23.

470. A. Napier [1970], A new game in town, *Empire Mag., Denver Post*, May 2.

471. A. Negro and M. Sereno [1992], Solution of Ulam's problem on binary search with three lies, *J. Combin. Theory* (Ser. A) **59**, 149–154.

472. J. Nešetřil and R. Thomas [1987], Well quasi ordering, long games and combinatorial study of undecidability, *Contemp. Math.* **65**, 281–293.

473. S. Neufeld and R. J. Nowakowski [1993], A vertex-to-vertex pursuit game played with disjoint sets of edges, in: *Finite and Infinite Combinatorics in Sets and Logic* (N. W. Sauer et al., eds.), Kluwer, Dordrecht, pp. 299–312.

474. R. J. Nowakowski [1991], ...,Welter's game, Sylver coinage, dots-and-boxes, ..., in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 155–182.

475. R. J. Nowakowski and D. G. Poole [1996], Geography played on products of directed cycles, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

476. R. Nowakowski and P. Winkler [1983], Vertex-to-vertex pursuit in a graph, *Discrete Math.* **43**, 235–239.

477. S. P. Nudelman [1995], The modular n-queens problem in higher dimensions, *Discrete Math.* **146**, 159–167.

478. T. H. O'Beirne [1984], *Puzzles and Paradoxes*, Dover, New York, NY. (Appeared previously by Oxford University Press, London, 1965.)

479. H. K. Orman [1996], Pentominoes: a first player win, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

480. E. W. Packel [1987], The algorithm designer versus nature: a game-theoretic approach to information-based complexity, *J. Complexity* **3**, 244–257.

481. C. H. Papadimitriou [1985], Games against nature, *J. Comput. System Sci.* **31**, 288–301.

482. A. Papaioannou [1982], A Hamiltonian game, *Ann. Discrete Math.* **13**, 171–178.

483. T. D. Parsons [1978], Pursuit-evasion in a graph, in: *Theory and Applications of Graphs* (Y. Alavi and D. R. Lick, eds.), Springer-Verlag, 426–441.

484. T. D. Parsons [1978], The search number of a connected graph, *Proc. 9th South-Eastern Conf. on Combinatorics, Graph Theory, and Computing*, 549–554.

485. O. Patashnik [1980], Qubic: $4 \times 4 \times 4$ Tic-Tac-Toe, *Math. Mag.* **53**, 202–216.

486. J. L. Paul [1978], Tic-Tac-Toe in n dimensions, *Math. Mag.* **51**, 45–49.

487. W. J. Paul, E. J. Prauss and R. Reischuk [1980], On alternation, *Acta Informatica* **14**, 243–255.

488. W. J. Paul and R. Reischuk [1980], On alternation, II, *Acta Informatica* **14**, 391–403.

489. J. Pearl [1980], Asymptotic properties of minimax trees and game-searching procedures, *Artificial Intelligence* **14**, 113–138.

490. J. Pearl [1984], *Heuristics: Intelligent Search Strategies for Computer Problem Solving*, Addison-Wesley, Reading, MA.

491. A. Pelc [1987], Solution of Ulam's problem on searching with a lie, *J. Combin. Theory* (Ser. A) **44**, 129–140.

492. A. Pelc [1988], Prefix search with a lie, *J. Combin. Theory* (Ser. A) **48**, 165–173.

493. A. Pelc [1989], Detecting errors in searching games, *J. Combin. Theory* (Ser. A) **51**, 43–54.

494. D. H. Pelletier [1987], Merlin's magic square, *Amer. Math. Monthly* **94**, 143–150.

495. G. L. Peterson, Press-Ups is Pspace-complete, Unpublished manuscript.

496. G. L. Peterson and J. H. Reif [1979], Multiple-person alternation, Proc. 20th Ann. Symp. Foundations Computer Science (San Juan, Puerto Rico, Oct. 1979), IEEE Computer Soc., Long Beach, CA, pp. 348–363.

497. N. Pippenger [1980], Pebbling, Proc. 5th IBM Symp. Math. Foundations of Computer Science, IBM, Japan (19 pp.)

498. N. Pippenger [1982], Advances in pebbling, in: Proc. 9th Internat. Colloq. Automata, Languages and Programming (M. Nielson and E. M. Schmidt, eds.), *Lecture Notes in Computer Science* **140**, 407–417, Springer Verlag, New York, NY.

499. T. E. Plambeck [1992], Daisies, Kayles, and the Sibert-Conway decomposition in misère octal games, *Theoret. Comput. Sci.* (*Math Games*) **96**, 361–388.

500. V. Pless [1991], Games and codes, in: Combinatorial Games, *Proc. Symp. Appl. Math.* **43** (R. K. Guy, ed.), Amer. Math. Soc., Providence, RI, pp. 101–110.

501. D. Poole [1992], The bottleneck towers of Hanoi problem, *J. Recr. Math.* **24**, 203–207.

502. D. G. Poole [1994], The towers and triangles of Professor Claus (or, Pascal knows Hanoi), *Math. Mag.* **67**, 323–344.

503. J. Propp [1994], A new take-away game, in: The Lighter Side of Mathematics, Proc. E. Strens Memorial Conf. on Recr. Math and its History (R. K. Guy and R. E. Woodrow, eds.), Calgary, 1986, Spectrum Series, Math. Assoc. of America, Washington, DC, pp. 212–221.

504. J. Propp [1996], About David Richman, Prologue to the paper by J. D. Lazarus et al. [1996], in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

505. J. Propp [$\geq$1996], Three-person impartial games, preprint.

506. J. Propp and D. Ullman [1992], On the cookie game, *Internat. J. Game Theory* **20**, 313–324.

507. A. Pultr and F. L. Morris [1984], Prohibiting repetitions makes playing games substantially harder, *Internat. J. Game Theory* **13**, 27–40.

508. A. Quilliot [1982], Discrete pursuit games, Proc. 13th Conference on Graphs and Combinatorics, Boca Raton, FL.

509. A. Quilliot [1985], A short note about pursuit games played on a graph with a given genus, *J. Combin. Theory* (Ser. B) **38**, 89–92.

510. M. O. Rabin [1957], Effective computability of winning strategies, Contributions to the Theory of Games vol. 3, *Ann. of Math. Stud.* **39**, 147–157, Princeton.

511. M. O. Rabin [1976], Probabilistic algorithms, Proc. Symp. on New Directions and Recent Results in Algorithms and Complexity (J. F. Traub, ed.), Carnegie-Mellon, Academic Press, New York, NY, pp. 21–39.

512. B. Ravikumar and K. B. Lakshmanan [1984], Coping with known patterns of lies in a search game, *Theoret. Comput. Sci.* **33**, 85–94.

513. M. Reichling [1987], A simplified solution of the N queens' problem, *Inform. Process. Lett.* **25**, 253–255.

514. J. H. Reif [1984], The complexity of two-player games of incomplete information, *J. Comput. System Sci.* **29**, 274–301. Earlier draft entitled Universal games of incomplete information, appeared in Proc. 11th Ann. ACM Symp. Theory of Computing (Atlanta, GA, 1979), Assoc. Comput. Mach., New York, NY, pp. 288–308.

515. S. Reisch [1980], Gobang ist PSPACE-vollständig, *Acta Informatica* **13**, 59–66.

516. S. Reisch [1981], Hex ist PSPACE-vollständig, *Acta Informatica* **15**, 167–191.

517. M. Richardson [1953], Extension theorems for solutions of irreflexive relations, *Proc. Nat. Acad. Sci. U. S. A.* **39**, 649.

518. M. Richardson [1953], Solutions of irreflexive relations, *Ann. of Math.* **58**, 573–590.

519. R. D. Ringeisen [1974], Isolation, a game on a graph, *Math. Mag.* **47**, 132–138.

520. R. L. Rivest, A. R. Meyer, D. J. Kleitman, K. Winklman and J. Spencer [1980], Coping with errors in binary search procedures, *J. Comput. System Sci.* **20**, 396–404.

521. I. Rivin, I. Vardi and P. Zimmermann[1994], The n-queens problem, *Amer. Math. Monthly* **101**, 629–638.

522. I. Rivin and R. Zabih [1992], A dynamic programming solution to the N-queens problem, *Inform. Process. Lett.* **41**, 253–256.

523. E. Robertson and I. Munro [1978], NP-completeness, puzzles and games, *Utilitas Math.* **13**, 99–116.

524. A. G. Robinson and A. J. Goldman [1989], The set coincidence game: complexity, attainability, and symmetric strategies, *J. Comput. System Sci.* **39**, 376–387.

525. A. G. Robinson and A. J. Goldman [1990], On Ringeisen's isolation game, *Discrete Math.* **80**, 297–312.

526. A. G. Robinson and A. J. Goldman [1990], On the set coincidence game, *Discrete Math.* **84**, 261–283.

527. A. G. Robinson and A. J. Goldman [1991], On Ringeisen's isolation game, II, *Discrete Math.* **90**, 153–167.

528. A. G. Robinson and A. J. Goldman [1993], The isolation game for regular graphs, *Discrete Math.* **112**, 173–184.

529. J. M. Robson [1983], The complexity of Go, Proc. Information Processing 83 (R. E. A. Mason, ed.), Elsevier, Amsterdam, pp. 413–417.

530. J. M. Robson [1984], Combinatorial games with exponential space complete decision problems, Proc. 11th Symp. Math. Foundations of Computer Science (M. P. Chytie and V. Koubek, eds.), Praha, Czechoslovakia, 1984, *Lecture Notes in Computer Science* **176**, 498–506, Springer, Berlin.

531. J. M. Robson [1984], N by N checkers is Exptime complete, *SIAM J. Comput.* **13**, 252–267.

532. J. M. Robson [1985], Alternation with restrictions on looping, *Inform. and Control* **67**, 2–11.

533. E. Y. Rodin [1989], A pursuit-evasion bibliography – version 2, *Comput. Math. Appl.* **18**, 245–250.

534. J. S. Rohl [1983], A faster lexicographical n-queens algorithm, *Inform. Process. Lett.* **17**, 231–233.

535. I. Roizen and J. Pearl [1983], A minimax algorithm better than alpha-beta? Yes and no, *Artificial Intelligence* **21**, 199–220.

536. I. Rosenholtz [1993], Solving some variations on a variant of Tic-Tac-Toe using invariant subsets, *J. Recr. Math.* **25**, 128-135.

537. A. S. C. Ross [1953], The name of the game of Nim, Note 2334, *Math. Gaz.* **37**, 119–120.

538. A. E. Roth [1978], A note concerning asymmetric games on graphs, *Naval Res. Logist. Quart.* **25**, 365–367.

539. A. E. Roth [1978], Two-person games on graphs, *J. Combin. Theory* (Ser. B) **24**, 238–241.

540. T. Roth [1974], The tower of Brahma revisited, *J. Recr. Math.* **7**, 116–119.

541. E. M. Rounds and S. S. Yau [1974], A winning strategy for SIM, *J. Recr. Math.* **7**, 193–202.

542. W. L. Ruzzo [1980], Tree-size bounded alternation, *J. Comput. Systems Sci.* **21** (1980), 218–235.

543. S. Sackson [1946], *A Gamut of Games*, Random House.

544. M. Saks and A. Wigderson [1986], Probabilistic Boolean decision trees and the complexity of evaluating game trees, 27th Ann. Symp. Foundations of Computer Science (Toronto, Ont., Canada), IEEE Computer Soc., Washington, DC, pp. 29–38.

545. M. Sato [1972], Grundy functions and linear games, Publ. Res. Inst. Math. Sciences, Kyoto Univ., Vol. 7, 645–658.

546. W. L. Schaaf [1955, 1970, 1973, 1978], *A Bibliography of Recreational Mathematics* (four volumes), Nat'l. Council of Teachers of Mathematics, Reston, VA.

547. T. J. Schaefer [1976], Complexity of decision problems based on finite two-person perfect information games, 8th Ann. ACM Symp. Theory of Computing (Hershey, PA, 1976), Assoc. Comput. Mach., New York, NY, pp. 41–49.

548. T. J. Schaefer [1978], On the complexity of some two-person perfect-information games, *J. Comput. System Sci.* **16**, 185–225.

549. J. Schaeffer [1996], Solving the game of checkers, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

550. M. Scheepers [1994], Variations on a game of Gale (II): Markov strategies, *Theoret. Comput. Sci.* (*Math Games*) **129**, 385–396.

551. G. Schmidt and T. Ströhlein [1985], On kernels of graphs and solutions of games: a synopsis based on relations and fixpoints, *SIAM J. Alg. Disc. Math.* **6**, 54–65.

552. G. Schrage [1985], A two-dimensional generalization of Grundy's game, *Fibonacci Quart.* **23**, 325–329.

553. H. Schubert [1953], *Mathematische Mussestunden*, Neubearbeitet von F. Fitting, Elfte Auflage, De Gruyter, Berlin.

554. F. Schuh [1952], Spel van delers (The game of divisors), *Nieuw Tijdschrift voor Wiskunde* **39**, 299–304.

555. F. Schuh [1968], *The Master Book of Mathematical Recreations*, translated by F. Göbel, edited by T. H. O'Beirne, Dover, New York, NY.

556. B. L. Schwartz [1971], Some extensions of Nim, *Math. Mag.* **44**, 252–257.

557. A. J. Schwenk [1970], Take-away games, *Fibonacci Quart.* **8**, 225–234.

558. R. S. Scorer, P. M. Grundy and C. A. B. Smith [1944], Some binary games, *Math. Gaz.* **28**, 96–103.

559. Á. Seress [1992], On Hajnal's triangle-free game, *Graphs Combin.* **8**, 75–79.

560. L. E. Shader [1978], Another strategy for SIM, *Math. Mag.* **51**, 60–64.

561. A. S. Shaki [1979], Algebraic solutions of partizan games with cycles, *Math. Proc. Camb. Phil. Soc.* **85**, 227–246.

562. A. Shamir, R. L. Rivest and L. M. Adleman [1981], Mental Poker, in: *The Mathematical Gardner* (D. A. Klarner, ed.), Wadsworth Internat., Belmont, CA, pp. 37–43.

563. G. J. Sherman [1978], A child's game with permutations, *Math. Mag.* **51**, 67–68.

564. W. L. Sibert and J. H. Conway [1992], Mathematical Kayles, *Internat. J. Game Theory* **20**, 237–246.

565. R. Silber [1976], A Fibonacci property of Wythoff pairs, *Fibonacci Quart.* **14**, 380–384.

566. R. Silber [1977], Wythoff's Nim and Fibonacci representations, *Fibonacci Quart.* **15**, 85–88.

567. J.-N. O. Silva [1993], Some game bounds depending on birthdays, *Portugaliae Math.* **3**, 353–358.

568. R. Silver [1967], The group of automorphisms of the game of 3-dimensional ticktacktoe, *Amer. Math. Monthly* **74**, 247–254.

569. D. L. Silverman [1971], *Your Move*, McGraw-Hill.

570. G. J. Simmons [1969], The game of SIM, *J. Recr. Math.* **2**, 193–202.

571. D. Singmaster [1981], Almost all games are first person games, *Eureka* **41**, 33–37.

572. D. Singmaster [1982], Almost all partizan games are first person and almost all impartial games are maximal, *J. Combin. Inform. System Sci.* **7**, 270–274.

573. C. A. B. Smith [1966], Graphs and composite games, *J. Combin. Theory* **1**, 51–81. Reprinted in slightly modified form in: *A Seminar on Graph Theory* (F. Harary, ed.), Holt, Rinehart and Winston, New York, NY, 1967.

574. C. A. B. Smith [1968], Compound games with counters, *J. Recr. Math.* **1**, 67–77.

575. C. A. B. Smith [1971], Simple game theory and its applications, *Bull. Inst. Math. Appl.* **7**, 352–357.

576. D. E. Smith and C. C. Eaton [1911], Rithmomachia, the great medieval number game, *Amer. Math. Montly* **18**, 73–80.

577. R. Sosic and J. Gu [1990], A polynomial time algorithm for the n-queens problem, *SIGART* **1**, 7–11.

578. J. Spencer [1977], Balancing games, *J. Combin. Theory* (Ser. B) **23**, 68–74.

579. J. Spencer [1984], Guess a number with lying, *Math. Mag.* **57**, 105–108.

580. J. Spencer [1986], Balancing vectors in the max norm, *Combinatorica* **6**, 55–65.

581. J. Spencer [1991], Threshold spectra via the Ehrenfeucht game, *Discrete App. Math.* **30**, 235–252.

582. J. Spencer [1992], Ulam's searching game with a fixed number of lies, *Theoret. Comput. Sci.* (*Math Games*) **95**, 307–321.

583. J. Spencer [1994], Randomization, derandomization and antirandomization: three games, *Theoret. Comput. Sci.* (*Math Games*) **131**, 415–429.

584. E. L. Spitznagel, Jr. [1973], Properties of a game based on Euclid's algorithm, *Math. Mag.* **46**, 87–92.

585. R. Sprague [1935–36], Über mathematische Kampfspiele, *Tôhoku Math. J.* **41**, 438–444.

586. R. Sprague [1937], Über zwei Abarten von Nim, *Tôhoku Math. J.* **43**, 351–359.

587. R. Sprague [1947], Bemerkungen über eine spezielle Abelsche Gruppe, *Math. Z.* **51**, 82–84.

588. R. Sprague [1961], *Unterhaltsame Mathematik*, Vieweg and Sohn, Braunschweig, Paperback reprint, translation by T. H. O'Beirne: *Recreations in Mathematics*, Blackie, 1963.

589. H. Steinhaus [1960], Definitions for a theory of games and pursuit, *Naval Res. Logist. Quart.* **7**, 105–108.

590. V. N. Stepanenko [1975], Grundy games under conditions of semidefiniteness, *Cybernetics* **11**, 167–172 (trans. of *Kibernetika* **11** (1975) 145–149).

591. B. M. Stewart [1939], Problem 3918 (k-peg tower of Hanoi), *Amer. Math. Monthly* **46**, 363. Solution by J. S. Frame, *ibid.* **48** (1941) 216–217; by the proposer, *ibid.* 217–219.

592. L. Stiller [1988], Massively parallel retrograde analysis. Tech. Report BU-CS TR88–014, Comp. Sci. Dept., Boston University.

593. L. Stiller [1989], Parallel analysis of certain endgames, *Internat. Comp. Chess Assoc. J.* **12**, 55–64.

594. L. Stiller [1991], Group graphs and computational symmetry on massively parallel architecture, *J. Supercomputing* **5**, 99–117.

595. L. Stiller [1996], Multilinear algebra and chess endgames in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

596. D. L. Stock [1989], Merlin's magic square revisited, *Amer. Math. Monthly* **96**, 608–610.

597. L. J. Stockmeyer and A. K. Chandra [1979], Provably difficult combinatorial games, *SIAM J. Comput.* **8**, 151–174.

598. J. A. Storer [1983], On the complexity of chess, *J. Comput. System Sci.* **27**, 77–100.

599. P. D. Straffin, Jr. [1985], Three-person winner-take-all games with McCarthy's revenge rule, *College J. Math.* **16**, 386–394.

600. Th. Ströhlein and L. Zagler [1977], Analyzing games by Boolean matrix iteration, *Discrete Math.* **19**, 183–193.

601. W. Stromquist and D. Ullman [1993], Sequential compounds of combinatorial games, *Theoret. Comput. Sci.* (*Math Games*) **119**, 311–321.
602. K. Sugihara and I. Suzuki [1989], Optimal algorithms for a pursuit-evasion problem in grids, *SIAM J. Disc. Math.* **1**, 126–143.
603. K. Sutner [1988], On σ-automata, *Complex Systems* **2**, 1-28.
604. K. Sutner [1989], Linear cellular automata and the Garden-of-Eden, *Math. Intelligencer* **11**, 49-53.
605. K. Sutner [1990], The σ-game and cellular automata, *Amer. Math. Monthly* **97**, 24–34.
606. J. L. Szwarcfiter and G. Chaty [1994], Enumerating the kernels of a directed graph with no odd circuits, *Inform. Process. Lett.* **51**, 149–153.
607. G. Tardos [1988], Polynomial bound for a chip firing game on graphs, *SIAM J. Disc. Math.* **1**, 397–398.
608. M. Tarsi [1983], Optimal search on some game trees, *J. Assoc. Comput. Mach.* **30**, 389–396.
609. R. Telgársky [1987], Topological games: on the 50th anniversary of the Banach-Mazur game, *Rocky Mountain J. Math.* **17**, 227–276.
610. K. Thompson [1986], Retrograde analysis of certain engames, *Internat. Comp. Chess Assoc. J.* **9**, 131–139.
611. I. Tomescu [1990], Almost all digraphs have a kernel, *Discrete Math.* **84**, 181–192.
612. R. Tošić and S. Šćekić [1983], An analysis of some partizan graph games, Proc. 4th Yugoslav Seminar on Graph Theory, Novi Sad, pp. 311–319.
613. A. M. Turing, M. A. Bates, B. V. Bowden and C. Strachey [1953], Digital computers applied to games, in: *Faster Than Thought* (B. V. Bowden, ed.), Pitman, London, pp. 286–310.
614. R. Uehara and S. Iwata [1990], Generalized Hi-Q is NP-complete, *Trans. IEICE* **E73**, 270–273.
615. J. Úlehla [1980], A complete analysis of von Neumann's Hackendot, *Internat. J. Game Theory* **9**, 107–113.
616. D. Ullman [1992], More on the four-numbers game, *Math. Mag.* **65**, 170–174.
617. S. Vajda [1992], *Mathematical Games and How to Play Them*, Ellis Horwood Series in Mathematics and its Applications, Chichester, England.
618. H. J. van den Herik and I. S. Herschberg [1985], The construction of an omniscient endgame database, *Internat. Comp. Chess Assoc. J.* **8**, 66–87.
619. J. van Leeuwen [1976], Having a Grundy-numbering is NP-complete, Report No. 207, Computer Science Dept., Pennsylvania State University, University Park, PA.
620. A. J. van Zanten [1990], The complexity of an optimal algorithm for the generalized tower of Hanoi problem, *Intern. J. Comput. Math.* **36**, 1–8.

621. A. J. van Zanten [1991], An iterative optimal algorithm for the generalized tower of Hanoi problem, *Intern. J. Comput. Math.* **39**, 163–168.

622. I. Vardi [1990], *Computational Recreations in Mathematica*, Addison Wesley.

623. I. P. Varvak [1968], Games on the sum of graphs, *Cybernetics* **4**, 49–51 (trans. of *Kibernetika* **4** (1968) 63–66).

624. J. Veerasamy and I. Page [1994], On the towers of Hanoi problem with multiple spare pegs, *Intern. J. Comput. Math.* **52**, 17–22.

625. H. Venkateswaran and M. Tompa [1989], A new pebble game that characterizes parallel complexity classes, *SIAM J. Comput.* **18**, 533–549.

626. D. Viaud [1987], Une stratégie générale pour jouer au Master-Mind, RAIRO Recherche opérationelle/Operations Research **21**, 87–100.

627. J. von Neumann [1928], Zur Theorie der Gesellschaftsspiele, *Math. Ann.* **100**, 295–320.

628. J. von Neumann and O. Morgenstern [1953], *Theory of Games and Economic Behaviour*, 3rd ed., Princeton University Press, Princeton, NJ.

629. J. L. Walsh [1953], The name of the game of Nim, Letter to the Editor, *Math. Gaz.* **37**, 290.

630. T. R. Walsh [1982], The towers of Hanoi revisited: moving the rings by counting the moves, *Inform. Process. Lett.* **15**, 64–67.

631. T. R. Walsh [1983], Iteration strikes back at the cyclic towers of Hanoi, *Inform. Process. Lett.* **16**, 91–93.

632. A. Washburn [1990], Deterministic graphical games, *J. Math. Anal. Appl.* **153**, 84–96.

633. W. A. Webb [1982], The length of the four-number game, *Fibonacci Quart.* **20**, 33–35.

634. C. P. Welter [1952], The advancing operation in a special abelian group, *Nederl. Akad. Wetensch. Proc.* (Ser. A) **55** = *Indag. Math.* **14**, 304–314.

635. C. P. Welter [1954], The theory of a class of games on a sequence of squares, in terms of the advancing operation in a special group, *Nederl. Akad. Wetensch. Proc.* (Ser. A) **57** = *Indag. Math.* **16**, 194–200.

636. J. West [1996], Champion-level play of domineering, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

637. J. West [1996], Champion-level play of dots-and-boxes, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

638. J. West [1996], New values for Top Entails, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R.

J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.

639. M. J. Whinihan [1963], Fibonacci Nim, *Fibonacci Quart.* **1**(4), 9–12.
640. R. Wilber [1988], White pebbles help, *J. Comput. System Sci.* **36**, 108–124.
641. R. M. Wilson [1974], Graph puzzles, homotopy and the alternating group, *J. Combin. Theory* (Ser. B) **16**, 86–96.
642. D. Wolfe [1993], Snakes in domineering games, *Theoret. Comput. Sci.* (*Math Games*) **119**, 323–329.
643. D. Wolfe [1996], The gamesman's toolkit, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
644. D. Wood [1981], The towers of Brahma and Hanoi revisited, *J. Recr. Math.* **14**, 17–24.
645. D. Wood [1983], Adjudicating a towers of Hanoi contest, *Intern. J. Comput. Math.* **14**, 199–207.
646. J.-S. Wu and R.-J. Chen [1992], The towers of Hanoi problem with parallel moves, *Inform. Process. Lett.* **44**, 241–243.
647. J.-S. Wu and R.-J. Chen [1993], The towers of Hanoi problem with cyclic parallel moves, *Inform. Process. Lett.* **46**, 1–6.
648. W. A. Wythoff [1907], A modification of the game of Nim, *Nieuw Arch. Wisk.* **7**, 199–202.
649. A. M. Yaglom and I. M. Yaglom [1967], *Challenging Mathematical Problems with Elementary Solutions*, translated by J. McCawley, Jr., revised and edited by B. Gordon, Vol. II, Holden-Day, San Francisco.
650. Y. Yamasaki [1978], Theory of division games, Publ. Res. Inst. Math. Sciences, Kyoto Univ., Vol. 14, pp. 337–358.
651. Y. Yamasaki [1980], On misère Nim-type games, *J. Math. Soc. Japan* **32**, 461–475.
652. Y. Yamasaki [1981], The projectivity of Y-games, Publ. Res. Inst. Math. Sciences, Kyoto Univ., Vol. 17, pp. 245–248.
653. Y. Yamasaki [1981], Theory of Connexes I, Publ. Res. Inst. Math. Sciences, Kyoto Univ., Vol. 17, pp. 777–812.
654. Y. Yamasaki [1985], Theory of connexes II, Publ. Res. Inst. Math. Sciences, Kyoto Univ., Vol. 21, 403–410.
655. Y. Yamasaki [1989], *Combinatorial Games*: *Back and Front* (in Japanese), Springer Verlag, Tokyo.
656. Y. Yamasaki [1991], A difficulty in particular Shannon-like games, *Discrete Appl. Math.* **30**, 87–90.
657. Y. Yamasaki [1993], Shannon-like games are difficult, *Discrete Math.* **111**, 481–483.

658. L. J. Yedwab [1985], On playing well in a sum of games, M. Sc. thesis, MIT, MIT/LCS/TR-348.
659. Y. Yesha [1978], Theory of annihilation games, Ph. D. thesis, Weizmann Institute of Science, Rehovot, Israel.
660. Y. K. Yu and R. B. Banerji [1982], Periodicity of Sprague-Grundy function in graphs with decomposable nodes, *Cybernetics and Systems*: *An Internat. J.* **13**, 299–310.
661. S. Zachos [1988], Probabilistic quantifiers and games, *J. Comput. System Sci.* **36**, 433–451.
662. E. Zermelo [1912], Über eine Anwendung der Mengenlehre auf die Theorie des Schachspiels, Proc. 5th Int. Cong. Math., Cambridge, Cambridge University Press, 1913, Vol. II, pp. 501–504.
663. M. Zieve [1996], Take-away games, in: *Combinatorial Games*, Proc. MSRI Workshop on Combinatorial Games, July, 1994, Berkeley, CA (R. J. Nowakowski, ed.), MSRI Publ. Vol. 29, Cambridge University Press, Cambridge, pp. XX–XX.
664. U. Zwick and M. S. Paterson [1993], The memory game, *Theoret. Comput. Sci.* (*Math Games*) **110**, 169–196.
665. U. Zwick and M. S. Paterson [$\geq$1996], The complexity of mean payoff games on graphs, preliminary version to appear in Proc. COCOON '95, Xi'an, China. Journal version to appear in *Theoret. Comput. Sci.* (*Math Games*).
666. W. S. Zwicker [1987], Playing games with games: the hypergame paradox, *Amer. Math. Monthly* **94**, 507–514.