how mathematicians have cracked "a simpler version" (News Focus, 27 Nov., p. 1631). The term "solitaire," of course, comprises a menagerie of games, which share, if nothing else, the feature that they can be played alone (*1*). One is not sure, then, what exactly the probabilists' game is simpler than. From the description, it appears to be playable alone and thus is not in any sense a different species.

A distinction that can be drawn is that many solitaires involve strategy rather than rote performance and chance (*2, 3*), so the odds of winning are variable depending on skill, although perhaps subject to an upper limit that can be estimated empirically from a large sample if the opportunity is available to replay each loss and comb for missed solutions. Walter Gibson discusses strategy for 31 solitaires (*4*), including Klondike, which has been deemed the most popular (*1*, pp. 14–15; *3*, p. 94; *5*). David Bervelier devotes most of an entire book to the gold rush gambling hall variant of Klondike, which uses one-card "flops" (*6*).

The latter is a term used by Brooke Boering, creator and webmaster of the *Klondike Pro* site, through which players meet on the Internet to compete in the electronic equivalent of duplicate bridge (*7*). *Klondike Pro* uses three-card "fanned," rather than "blind," flops, so that all three cards are visible. I myself play Klondike strategically with three-card blind flops where only the top card of each trio is visible (*8*). I cannot imagine mathematicians successfully analyzing this commonest of solitaires (fanning, playing blind, or using the one-card flop), nor can I fathom that they would even try. They may want to consult the *Klondike Pro* aficionados.

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References

1. A. Morehead and G. Mott-Smith, *The Complete Book of Solitaire & Patience Games* (Bantam, New York, 1981).
2. R. Foster, *Complete Hoyle: An Encyclopedia of Games* (Lippincott, Philadelphia, PA, 1953), p. 474.
3. D. Parlett, *Solitaire: Aces Up and 399 Other Card Games* (Pantheon, New York, 1979), p. 11.
4. W. Gibson, *How to Play Winning Solitaire* (Frederick Fell, New York, 1964).
5. J. Scarne, *Scarne's Encyclopeid of Games* (Harper & Row, New York, 1973), p. 398.
6. D. Bervelier, *Strategic Solitaire* (McFarland, Jefferson, NC, 1987).
7. *Klondike Pro*, bbs.cruzio.com/~vagabond; L. Brown, "Solitaire is no longer solitary," *The Ledger* (1997), www.theledger.com/data/columns/dt062397. htm.
8. E-mail exchanges with B. Boering, 11 to 15 December 1998.

Response

I welcome Kuykendall's willingness to include the version of solitaire solved by Percy Deift as a member of the solitaire "menagerie." By the "common game of solitaire" I was, indeed, referring to Klondike solitaire. The version analyzed by Deift is simpler than Klondike in two ways. First, an optimal strategy is known. (In fact, it could probably be found by any solitaire expert, although proving it is optimal is slightly harder.) Second, the probability distribution of outcomes, assuming perfect play, is now known as well, thanks to the work of Deift *et al.*

Although, as Kuykendall suggests, the prospects for such a complete analysis of Klondike solitaire appear remote, mathematicians are trying! Persi Diaconis has conducted both human and computer experiments to determine the probability of winning at Klondike software. Interestingly, humans still win more often than Diaconis's best computer program.

—Dana Mackenzie

CORRECTIONS AND CLARIFICATIONS

Figure 1, panels F, G, and H (p. 1495) of the report "Induction and evasion of host defenses by type 1–piliated uropathogenic *Escherichia coli*" by M. A. Mulvey *et al.* (20 Nov., p. 1494) were incompletely printed. The full panels appear below.