GAME THEORY AND POE'S DETECTIVE STORIES AND LIFE

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INTRODUCTION

"The subject of priority in scientific discovery is a prickly one, since original scientific contributions are prized and multiple independent discoveries do occur [Dimand and Dimand, 1992, 24]." Regarding game theory, in 1713, "James Waldegrave provided the first minimax mixed strategy solution of a two-person game of strategy" [ibid., 25], but he made no extension of his solution of the card game *le Her* to other games, and John von Neumann [(1928) 1997] deserves the credit for the first general "proof of the existence of a maximin equilibrium for a broad class of games [Dimand and Dimand, 1997, xix]."

Similarly, searching for firsts within the range of literature is not easy. Regarding detective literature, the appearance, in 1841, of "The Murders in the Rue Morgue", written by Poe (1809-1849), "marked the birth of the detective story [van Doren Stern, 1977, xxv]." More precisely, Poe's three detective stories – "The Murders in the Rue Morgue" [MRM], "The Mystery of Marie Rogêt" [MMR] and "The Purloined Letter" [PL] [1] – are pioneer works. However, Chevalier Auguste Dupin, the hero of these three "Tales of Mystery and Ratiocination", is not the first detective character appearing in a literary work. For example, the central character of *Zadig ou la Destinée* [Voltaire, (1747) 1998] has the "quasi-divinatory skills" [Lacassin, 1993, 23] that Poe gives to Dupin. Moreover, Poe is generally thought to have been influenced by the *Mémoires* of François Eugène Vidocq, who in 1817 founded the world's first detective bureau, in Paris.

"What is important about Colombus' discovery of America is not that it was the first, but that it was the *last*. After Colombus, America was never lost again" [Roth and Sotomayor, 1990, 4]. Similarly, what is important about Poe's discovery of detective story and von Neumann's discovery of game theory is that, after Poe and von Neumann, detective story and game theory were never lost again.

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In 1944, von Neumann and Morgenstern [1944, 176-177] illustrated the problem of strategic interaction by the scene in Conan Doyle's story "The Final Problem", in which Holmes, pursued by the notorious Moriarty, must decide whether to get off his train at Dover or at Canterbury. Thus, they brought game theory and detective story together and showed that applying game theory to detective story could potentially contribute to the development of game theory and its ability to advance economic analysis. Actually, Morgenstern produced the example of the pursuit of Sherlock Holmes by Moriarty in his first book [Morgenstern, 1928]. He used this example in order to solve the problem "of the influence of predictions on the predicted events [Morgenstern, 1976, 806]." Coincidentally, this analysis "was published the same year as the proof of the Minimax Theorem" [Brams, 1994a, 37] by von Neumann. In 1935, Morgenstern published a paper [Morgenstern, (1935) 1976], "in which the same illustration of Sherlock Holmes and Moriarty was used once more, but the whole matter of prediction and foresight was put into a wider frame [Morgenstern, 1976, 806]."

Brams [1994a, 36] provides a chronological list of twenty-two literary works to which game theory has been applied. Conan Doyle's story "The Final Problem" is at the top of this list that includes Shakespeare's greatest writings, the *Old Testament* and PL. MRM and MMR do not appear on this list.

It is Poe's trilogy, however, that has laid down the "great concepts upon which all fictional detection worth the name has been based … [and] … the almost infinite minutiae" that are the features of the detective story [Haycraft, 1984, 12]. The most important of these minutiae is "deduction by putting one's self in another's position [ibid.]." Thus, both Poe's trilogy and game theory are based upon empathy. Moreover, Poe's letters contain unique and, at times, detailed information regarding behavior in strategic situations.

Our paper takes these observations as its starting point. Its purpose is threefold. First, we show that Dupin, as a private detective, thinks like a game theorist. To this end, we sum up and deepen analyzes of PL provided elsewhere, and we prove, as an original attempt, that MRM and MMR, as well as PL are filled with ratiocination that can be modeled according to game theory. Second, we briefly elaborate on a bargaining game that turns the three Dupin stories into a real trilogy, and we show that Dupin, as a negotiator, has learned the value of both putting himself in the other person's shoes and looking several moves ahead. Third, we show that Poe, as well as Dupin, thought like a game theorist. Two decisions of Poe had a great impact on his life: as a young man, he left his foster father's home; as a forty-year-old man, he took and published a temperance oath. We prove that these two very important decisions of Poe are consistent with game-theoretic behavior.

GAME THEORY AND EACH ONE OF THE THREE DUPIN STORIES

Chevalier August Dupin, the detective character created by Poe is the precursor of a long line of fictional sleuths. When he created this character, Poe "projected an idealization of himself as he would like to have been – a cool, infallible thinking machine that brought the power of reason to bear on all of life's problems and triumphantly solving them" [van Doren Stern, 1977, 330]. Poe was a man of superior intel-

lect. He had a gift for subtle reasoning and ratiocination. For example, in 1841, he foretold the solution of the murder mystery of Dickens' *Barnaby Rudge* [Quinn, 1941, 332]. Thus, in each one of the Poe's three "tales of mystery and ratiocination", Dupin has remarkable deductive powers.

Dupin versus a blackmailer

In PL, Poe's only detective story that does not deal with death or violence, Dupin is called upon to find a letter which an unscrupulous Minister is known to have stolen from the Queen. The disclosure of this document to the King would bring in question the honour of the Queen. "This fact gives the holder of the document an ascendancy over the illustrious personage … [because of] … the robber's knowledge of the loser's knowledge of the robber [PL, 442]." The Queen is thoroughly convinced of the necessity of reclaiming her letter, and she commits the matter to G, the Prefect of the Parisian police. G "investigates every nook and corner of the premises in which it is possible that the paper can be concealed [PL, 444]." These investigations fail, and G engages the services of Dupin. The latter manages to steal the letter from the Minister and hand it over to G.

In order to describe to his admiring foil the way he took back from the Minister the letter that the Minister had stolen from the Queen, Dupin uses the game of "even and odd": "This game is simple, and is played with marbles. One player holds in his hand a number of these toys, and demands of another whether that number is even or odd. If the guess is right, the guesser wins one; if wrong, he loses one [PL, 450]." Guilbaud [1949; 1954, Ch. III; 1997], Lacan [1966], Davis [1970] and Brams [1994a; 1994b] analyzed this game. According to Dupin, the game he plays against the Minister is similar to the game of "even and odd."

Let us assume that both players are intelligent: each one "knows everything that we know about the game and he can make any inferences about the situation that we can make" [Myerson, 1991, 4]. Then, we can model this situation by the non-cooperative static game of complete and imperfect information, the normal-form of which is shown in Table 1.

TABLE 1
The Normal-Form Representation of the
Player (Minister) / Opponent (Dupin) Game

O (D)

		e (c)	o (n)
P (M)	e (c)	-1, <u>1</u>	<u>1</u>, -1
	o (n)	<u>1</u>, -1	-1, <u>1</u>

In this bi-matrix, P, O, e and o denote respectively the player who conceals an even or an odd number of marbles in his hand, the opponent, and the two actions – even or odd – that are available to P, and that O has to guess; M, D, c and n denote respectively the Minister, Dupin and the two actions – to conceal the purloined letter or to resort "to the comprehensive and sagacious expedient of not attempting to conceal it at all" [PL, 458] – that are available to M, and that D has to guess.

After expounding his analysis of "even and odd", Dupin tells his friend about a game of puzzles, in which "one party playing requires another to find a given word … upon the motley and perplexed surface of the chart [PL, 457]." According to Dupin, in such a game, a novice "generally seeks to embarrass his opponents by giving them the most minutely lettered names; but the adept selects such words as stretch, in large characters, from one end of the chart to the other [ibid.]." This game looks like the games used by Schelling [1963] to illustrate the notion of focal point: all these games are played upon a map, and, at all these games, "poets may do better than logicians [ibid., 58]."

Finally, Dupin uses the games he has analyzed to clear up the riddle of the purloined letter. He knows that M, who is a "poet *and* mathematician" [PL, 453], can play c or n. Upon the decisive evidence, obtained by G, that the letter "is not hidden within the limits of that dignitary's ordinary search" [ibid., 458], Dupin conjectures rightly that the letter is "full in the view of every visitor" [ibid., 459], and he wins the play.

If both players are equally intelligent, "even and odd" is a static game that is classically used to motivate the notion of mixed strategy equilibrium: the only stable situation is one in which each player randomizes between his two pure strategies, assigning equal probability to each. However, there is no evidence that Poe understood the notion of a mixed strategy in PL [Brams, 1994a, 37; 1994b, 62-65]. Actually, Poe makes one player smarter than the other and assumes "that an extremely clever boy could always calculate exactly how far ahead less clever opponents would reason [ibid.]." He gives Dupin greater powers of observation and superior mind. So, he renders things simple and gets a tidy result.

More realistic games are embedded in MRM and MMR, which both deal with death and violence.

Dupin versus murderers

In MRM, Dupin makes the conjecture that it is an orang-outang that murdered Madame Lespanaye and her daughter. He is aware that his guesses are open to criticism: "I will not pursue these guesses – for I have no right to call them more – since the shades of reflection upon which they are based are scarcely of sufficient depth to be appreciable by my own intellect, and since I could not pretend to make them intelligible to the understanding of another [MRM, 368]." Dupin wants to add a proof by the use of a witness to his proof by the use of reason.

To this end, Dupin decides to advertise in the newspaper *Le Monde*. He assumes that the owner of the animal is a sailor belonging to a Maltese vessel, and he wants to make this man believe that he "may have the animal again, upon identifying it satisfactorily, and paying a few charges arising from its capture and keeping [ibid.]."

Figure 1 is the extensive-form representation of this non-cooperative dynamic game of complete and perfect information. In this figure, D and S denote respectively Dupin and the sailor owning the murderer orang-outang. D may affirm (a), or not (n), he knows that the man he searches for "is ascertained to be a sailor, belonging to a Maltese vessel [ibid.]." S may answer (a) or not (n) Dupin's advertisement. D wants to find the clue to the riddle: he earns 1, if he achieves his purpose, and 0, if he fails. S does not want "to attract attention" [ibid., 369] either to himself or to the beast: he earns 1, if he achieves his purpose, and loses 1, if he fails. If D plays a, it is in the interest of S to play a: "Should I avoid claiming a property of so great value, which is known that I possess, I will render the animal at least, liable to suspicion [ibid.]." If D plays n, it is in the interest of S to play n, in order to remain in the background. The subgame-perfect equilibrium of this game is the following combination of strategies: D plays a; S plays a if D plays a, and plays n if D plays n. This equilibrium is what is lurking beneath the end of MRM: D and S really play a.

FIGURE 1
The Extensive-Form Representation of the Dupin / Sailor Game
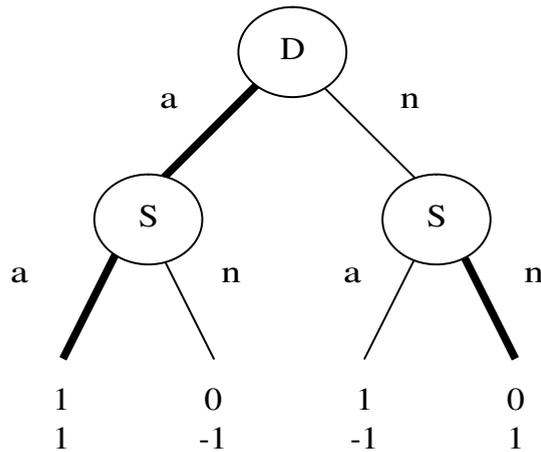
In MMR, which is an attempt to solve an actual murder case, a young girl named Marie Rogêt disappears and, four days later, her corpse is found floating in the river. The newspapers pick up the story and build up numerous theories. "Piqued by the failure of all his endeavors to ferret out the assassins" [MMR, 382], the Prefect engages the services of Dupin, who sets to work at once.

In order to avoid falling into the trap of information cascades, Dupin procures "a full report of all the evidence elicited" [ibid., 383], and he eliminates, one by one, the various newspapers' theories. Last, Dupin disproves the conjecture according to which Marie has been the victim of a *gang* of desperadoes: "I shall add but one to the arguments against a *gang*; but this *one* has, to my own understanding at least, a weight altogether irresistible. Under the circumstances of large reward offered, and full par-

don to any king's evidence, it is not to be imagined, for a moment, that some member of *a gang* of low ruffians, or of any body of men, would not long ago have betrayed his accomplices. Each one of a gang, so placed, is not so much greedy of reward, or anxious for escape, as *fearful of betrayal*. He betrays eagerly and early that *he may not himself be betrayed*. That the secret has not been divulged is the very best of proof that it is, in fact, a secret. The horrors of this dark deed are known only to *one*, or two, living human beings, and to God [ibid., 432-433]."

After summing up this analysis, Dupin attains the idea of a murder perpetrated by "the 'naval officer' who is first known to have led the unfortunate into crime [ibid., 433]."

Of course, Dupin's refutation of the gang theory is questionable. It cannot be overlooked that, "most frequently, gangs use punishment as a deterrent to attempts to exit [Sieberg, 2001, 114]." Thus, blackguards may be reluctant to betray one another, for fear of retaliation, and cooperation with one another can be achieved. Yet, gangs are "distinct from ephemeral teams of bandits or robbers who join together for the accomplishment of a specific task, after which the team disbands" [Skaperdas, 1998, 198], and, in the theory according to which Marie has been the victim of a gang of desperadoes, the word "gang" denotes actually such an ephemeral team of bandits, who do not fear that betraying will have bad consequences in the future.

Thus, the few lines quoted above show Poe's ability to use, in certain key-parts of his detective work, a rigorous game theoretic chain of reasoning that is based upon the Nash equilibrium of the very famous "Prisoner's Dilemma." That such a Nash equilibrium – each player betrays – has not been implemented is the proof that the murder of Marie Rogêt is an outrage committed by a single individual. Before Poe, Herodotus described an early example of the reasoning in the Prisoner's Dilemma in the conspiracy of Darius against the Magus Smerdis [Rasmusen, 1989, 38]. *Post hoc, ergo propter hoc?* It's anyone's guess how deeply Poe understood multi person decision problems, but there is at least a famous game in MRM, and this game helps Dupin to find the clue to the riddle.

From a game-theoretic point of view, the investigations made by Dupin, as a fictional sleuth, in each one of Poe's three detective stories are worthwhile. But we must not lose sight of this trilogy as a whole and of Dupin as a negotiator.

GAME THEORY AND POE'S TRILOGY AS A WHOLE

Poe endowed Dupin "with everything that he himself lacked [van Doren Stern, 1977, 330]." Poe "was all his life a starveling poet [ibid., xvi]." Dupin is not wealthy, but enjoys some independent means: "by courtesy of his creditors, there still remained in his possession a small remnant of his patrimony; and, upon the income arising from this, he managed, by means of a rigorous economy, to procure the necessaries of life, without troubling himself about its superfluities [MRM, 336]." Poe made little or nothing from the publication of his writings: he was "a miserably paid writer for ephemeral magazines [van Doren Stern, 1977, xvi]." Dupin makes money from his abilities.

A bargaining game between Dupin and Prefect G, which spans across the three Dupin stories as a whole, proves this conjecture.

In the last pages of MRM, Dupin gives G the solution of the tragedy in the "Rue Morgue." Dupin asks nothing of G, but he does not explain to G "the simple character of those inductions by which he has disentangled the mystery [MMR, 378]." Moreover, Dupin does not reveal to G that Lebon, who had been wrongly imprisoned, once rendered him a service for which he is "not ungrateful" [MRM, 352], and that the release of this clerk rewards his efforts. Dupin acquires for him "the credit of intuition" [MMR, 379], and he becomes "the cynosure of the political eyes [ibid.]." At the end of MRM, the fact that Dupin has strong analytical abilities is common knowledge between Dupin and G. Following Aumann [1976], we say that a fact is common knowledge among the players if every player knows it, every player knows that every player knows it, and so on…

In MMR, G engages the services of Dupin, and he makes "him a direct, and certainly a liberal proposition [MMR, 382]." Dupin accepts this proposition at once, "although its advantages were altogether provisional [ibid., 383]." Dupin finds the clue to the riddle, and "the Prefect fulfills punctually, although with reluctance, the terms of his compact with the Chevalier [ibid., 437]." At the end of MMR, the fact that G is willing to pay for a service is common knowledge between Dupin and G.

In PL, Dupin and G play a two-stage negotiation game of complete but imperfect information. Table 2 represents this bargaining game, which looks like the bank-run game analyzed by Gibbons [1992, 73-75].

<div align="center">

TABLE 2

The Normal-Form Representation of the Dupin / Prefect Game

</div>

<div align="center">

Prefect

</div>

		s	k
	a	$\underline{m}$, $\underline{M\text{-}m}$*	0, 0
Dupin	w	ε, M-ε	Next Stage**

<div align="center">

Stage 1

</div>

<div align="center">

Prefect

</div>

		s	k
	a	$\underline{50}$, $\underline{2M\text{-}50}$**	$\underline{0}$, 0
Dupin	w	ε, $\underline{2M\text{-}\varepsilon}$	$\underline{0}$, 0

<div align="center">

Stage 2

</div>

In the first stage, M denotes the "enormous" [PL, 444] reward that the Queen would give to G if he could obtain her the purloined letter. Dupin may arouse (a) G to a small offer m, or wait and see (w). Of course, 0 < m < M. G may share the reward (s) or keep it (k). In the second stage, the alternatives are the same for both players, but the reward offered by the Queen has been "doubled", and G wouldn't mind giving his individual check "for fifty thousand *francs* to anyone who could obtain" him the letter [ibid., 448]. In the second stage, there is a unique Nash equilibrium: Dupin plays a, and G plays s, leading to a payoff of (50, 2M – 50). Assuming that there is no discounting, we can substitute this payoff into the normal-form game of the first stage. This one-period version of the two-period game has two pure strategy Nash equilibria. In the first one, Dupin plays a, and G plays s, leading to a payoff of (m, M – m). In the second equilibrium, Dupin plays w, and G plays k, leading to a payoff of (50, 2M – 50). Consequently, the negotiation game has two outcomes: on the one hand, Dupin plays a, and G plays s in the first stage, yielding payoffs of (m, M – m); on the other hand, Dupin plays w, and G plays k in the first stage, next they play respectively a and s in the second stage, yielding payoffs of (50, 2M – 50). The second of these two outcomes of the negotiation game, that Pareto-dominates the first one, is the outcome of PL, since G "really" [ibid., 449] gives fifty thousand *francs* to Dupin.

In "The Philosophy of Composition" [PC], which is an *ex post facto* attempt to define the way he wrote "The Raven", Poe affirms that "every plot, worth the name, must be elaborated to its *dénouement* before anything be attempted with the pen [PC, 549-550]." This rule that Poe implemented in each and every Dupin story is similar to the basic rule of strategic behavior: "look ahead and reason back [Dixit and Nalebuff, 1991, 34]." That probably contributes to explaining why Poe's detective stories can be used to illustrate game-theoretic concepts.

Similarly, Poe's letters contain unique and detailed information regarding behavior in strategic situations. More precisely, these letters, as well as the three Dupin stories, provide another laboratory in which to examine the relevance of the game-theoretic approach. We mine these letters for their game-theoretic ideas. This enables us to picture Poe as he really was, and to understand him in contrast with his environment.

GAME THEORY AND THE TURNING POINTS IN POE'S LIFE

Of all American writers' lives, Poe's life is "the most fascinating [Van Doren Stern, 1977, xvii]." Two decisions of Poe had a great impact on his life: the first one is Poe's decision, as a young man, to leave his foster father's home; the second one is Poe's last try, as a forty-year-old man, to fight off the hold that alcohol had on him. Both these decisions are consistent with game-theoretic behavior.

Poe versus himself

At the age of seventeen, Poe was sent to the University of Virginia. During his stay at the University, his foster father, John Allan, gave him just enough money to live on. With his fellow students, the sons of wealthy planters, Poe took to gambling.

He lost and gambled again to recoup his losses, but he failed. In December 1826, Allan refused to let Poe return to the University of Virginia because bills were presented him for payment. Then, in March 1827, Poe abruptly left his foster father's home, and he sailed from Richmond to go to Boston. On December 1st, 1828, Poe wrote John Allan explaining his departure from home, nearly two years before, and his enlistment in the army as a common soldier, as follows: "I have thrown myself on the world, like the Norman Conqueror on the shores of Britain &, by my avowed assurance of victory, have destroyed the fleet which could alone cover my retreat – I must either conquer or die – succeed or be disgraced [Ostrom, 1966, 10]."

There is a difference between games and decision problems. In a decision problem, the single decision-maker cannot gain by reducing his action set (or the quality of his information), or decreasing his payoff to some outcomes. In a game, there are several decision-makers, and such commitments can be of value: for example, a player can benefit from the opportunity to make a binding commitment to play in a certain way, since by committing himself to a given sequence of actions he may be able to alter the play of his opponents, provided that they are aware of this change [Fudenberg and Tirole, 1991, 75].

Two famous examples highlight this theme of the value of commitment: William the Conqueror destroying his ships as a commitment not to retreat, and Odysseus lashing himself to the mast and stopping his men's ears with wax as a commitment not to go to the Sirens' island.

Both these stories show that the search for a way to commit oneself can lead to the use of actions that would not otherwise been considered. A difference between the conquest of England and the story of Odysseus is worth noting. In the conquest of England, William the Conqueror faces an enemy. Destroying his ships gave him two advantages: first, his own soldiers were united, since desertion or retreat was an impossibility; second, the enemy's soldiers lost heart because they knew that William had made an unconditional commitment to fight rather than to retreat, and that he must either succeed or perish, while they had the option to retreat into the hinterland. In the story of Odysseus, there is only one person. However, the natural way to model this story is with two players corresponding to Odysseus before and Odysseus after he is exposed to the Sirens, because Odysseus has evolving preferences, and he may be considered to be a different player at each period.

Poe thought that he was "like the Norman Conqueror on the shores of Britain." Poe was wrong: actually, he was not like William the Conqueror, because "the wide world" on which he threw himself was not concerned with Poe's behavior in any way. On the other hand, Poe, as well as Odysseus, was like a person who faces the "drug problem … [and] … may take or not drugs at the first period and either go on or give up at the second [Walliser, 1988, 182]." The diet problem [Luce and Raiffa, 1957, 75] and the smoking problem [Schelling, 1963, 123] are two other famous examples of games in which a person plays against himself.

Figure 2 shows the extensive-form representation of the non-cooperative dynamic game of Odysseus (Poe).

In this figure, O^1 and O^2 denote respectively Odysseus before and Odysseus after he hears the singing of the Sirens. Similarly, P^1 and P^2 denote respectively Poe before

FIGURE 2

The Extensive-Form Representation of the Game of Odysseus (Poe)
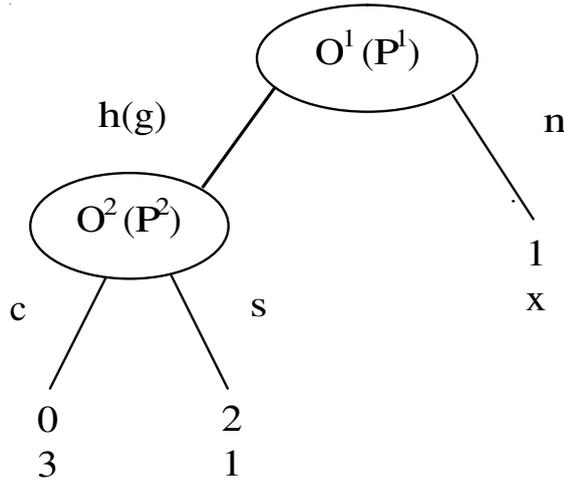
and Poe after he enjoys a life of leisure. In the first period, O^1 may hear the singing of the Sirens (h), or not (n), and P^1 may live as a Virginia gentleman (g), or not (n). If O^1 plays h, O^2 may play either continue (c) or stop (s) at the second period. If P^1 plays g, P^2 may play either c or s at the second period. In the first period Odysseus prefers hearing the singing of the Sirens and stopping later to not hearing this song, a strategy itself preferred to hearing the singing of the Sirens and continuing. But in the second period, he is addicted to this song and that constraint may be interpreted as a strong preference to staying to hear the enchanting sweetness of the singing of the Sirens. In the first period Poe prefers living as a Virginia gentleman and stopping later to not living as a Virginia gentleman, a strategy itself preferred to living as a Virginia gentleman for ever. But in the second period, he is addicted to idleness, and that constraint may be interpreted as a strong preference to staying to have a life of leisure.

In such a game, three behaviors are possible: the "myopic" behavior where the individual "optimizes separately at each period," the "committed" behavior where he "chooses in the first period the best actions for the two periods," and the "sophisticated" behavior where he "perfectly expects his future change in preferences and computes his move by backward induction [Walliser, 1988, 183]." The outcomes obtained by these three behaviors are respectively (0, 3), (2, 1), and (1, x). In the games illustrated in Figure 2, the (2, 1) outcome occurs. Odysseus manages to achieve a credible commitment by taking a collateral action: he orders his sailors to plug their ears with wax, and they bind him hands and feet to the mast. So he hears the singing of the Sirens and passes them. Poe managed to achieve a credible commitment by taking a collateral action: he left his foster father's home. So, after enjoying a life of leisure, he started to work hard.

For achieving credible commitments, many devices may be used [Dixit and Nalebuff, 1991, 144]. The most radical possibility is simply to destroy any avenues of retreat.

Odysseus uses this device. Poe, as a young man, did likewise. Both of these stories correspond to a total commitment: the cost of escaping from the mast or turning back is taken to be infinite. On August 1849, in order to free himself from the hold that alcohol had on him, Poe, as a forty-year-old man, used a partial commitment, which increased the cost of giving way to the temptation without making it infinite.

Poe versus Spirit of Southern Conviviality

Alcohol was a dangerous stimulant for Poe. He returned to it again and again, sometimes after long periods of abstention. Many theories, for example, rational addiction, could explain Poe's alcohol problem. However, in a letter that he wrote on April 1, 1841, to Dr. Snodgrass, Poe explains his drinking habits: "At no period of my life was I ever what men call intemperate. I never was in the *habit* of intoxication. I never drank drams, &c. But, for a brief period, while I resided in Richmond, and edited the *Messenger* I certainly did give way, at long intervals, to the temptation held out on all sides by the spirit of Southern conviviality. My sensitive temperament could not stand an excitement which was an everyday matter to my companions. In short, it happened that I was completely intoxicated [van Doren Stern, 1977, 16]."

In a society where conviviality was a matter of course, to refuse to drink with an acquaintance was almost an insult, and only a few were good enough friends to help Poe in his struggle against dipsomania. Poe thought that if people did not tempt him, he would not fall. So, in July or August 1849, after his reception in the Shockoe Hill Division, no. 54, of the Sons of Temperance, Poe took a temperance pledge, and published it in local newspapers, in order that shame irremediably swooped on him if he flagged. He acted so because he trusted neither himself nor others and because he had true confidence only in shame.

Table 3a represents the problem Poe faced, before he took his temperance oath, and published this pledge in local papers.

In this bi-matrix, Poe (P) faces "the spirit of Southern conviviality"(S). Actually, S denotes a society where conviviality is a matter of course, i.e., a society where to refuse to drink with an acquaintance is almost an insult. S, whom P knows to have extremely good predictive powers, is assumed to have made a prediction about what P will decide. P has a choice between two actions: sticking to an abstinence rule (r) or using his own discretion (d). If S expects P to play r, S does not offer P any drinks (n). If S expects P to play d, S offers P some drinks (o). P's payoff is the sum of two elements: P obtains 1 if he does not stick to an abstinence rule and 2 if S does not tempt him. From P's viewpoint, the best situation is (d, n): free will without any temptation. Next come (r, n), and (d, o): abstinence rule without any temptation, and immoderate use of drinks. The worst situation is (r, o): Tantalus torture. S is sensitive only to the rightness of his expectation: his gain is assumed to be 3 or 0 according to whether his expectations are correct or not.

The matrix of this game is quite identical to the matrix of the Newcomb's problem that describes a decision-maker (D) and a Genius (G). D has enormous confidence in G's power to predict D's choices. D has before him two closed boxes: B1 and B2. B1 contains $1 and B2 contains either $2 or nothing. D does not know the content of B2.

He has to choose either B2 only (a) or both boxes (b). If G expects D to play a, G puts $2 in B2 (f). If G expects D to play b, G leaves B2 empty (e). In all cases, B1 contains $1.

TABLE 3a
The Normal-Form Representation of the
Poe (Decision-maker) / Spirit of Southern Conviviality (Genius)
Game without public abstinence oath

S (G)

F (D)	w (f)	x (e)	
r (a)	2, (3)	0, (0)	Expected utility principle
d (b)	3, (0)	1, (3)	Dominance principle

In the heart of this problem long-discussed by Nozick [1997], there is a conflict between the expected-utility principle, which prescribes playing the first-row strategy, and the dominance principle, which prescribes playing the second-row strategy.

All his life Poe played the second-row strategy, and S played the second-column strategy. Poe's public oath of abstinence and its publication in local papers in the summer immediately prior to his death, i.e., a commitment move to change future behavior, got Poe out of that quandary for several months.

Table 3b represents the problem Poe faced, after he took his temperance oath, and published this pledge in local papers. In such a situation, the shame that Poe

TABLE 3b
The Normal-Form Representation of the Poe / Spirit of
Southern Conviviality Game with public abstinence oath

S

P	n	o
r	2, (3)	0, (0)
d	3, (0)	-2, (3)

would have endured if he had fallen off reduces the gains generated by the strategy d if S plays o, and there is no conflict between the expected-utility principle and the dominance principle. The latter becomes irrelevant. The former prescribes playing the first-row strategy. So Poe played this strategy, and S played n: "There had been no intimation that Mr. Poe had violated his pledge before leaving Richmond in October [Quinn, 1941, 624]."

However, Poe's state of grace did not go on, for his pledge was not irrevocable. It was a partial commitment, which increased the cost of giving way to the temptation without making it infinite. It was enough that Poe left Richmond, to get back to the initial game. He did so on September 27, 1849, when he took the steamer sailing to Baltimore.

CONCLUSION

Two points are worth noting. First it is not just Poe who made, in a manner of speaking, game theorists of his characters. The same can be said of Shakespeare and many earlier writers. In this respect, *Hamlet* [Brams, 1994b], *Macbeth* and Aristophanes' *Lysistrata* [ibid., 1997], or *Old Testament* [ibid., (1980) 2003] are convincing examples. Moreover, contemporary authors do so too. Brams and Jones [1999] analyze such an example: Joseph Heller's novel *Catch 22*. Second it is not just game theory that can be applied to literature. The theory of moves [Brams, 1994b] supplements standard game theory in enabling one better to model asymmetries between players, including fictional ones, even though this new theory is rather controversial [Stone, 2001, and Brams, 2001]. However, detective stories are a fertile ground for humanistic applications of game theory, and Poe's trilogy marks the birth of this new genre of literature. In addition, Poe's letters contain unique and detailed information regarding behavior in strategic situations. Therefore, in each of Poe's three detective stories featuring Dupin, in the Dupin trilogy as a whole, and in two pivotal episodes of Poe's life – Poe's decision to leave Allan's home as a young man and to publish a temperance oath twenty years later – behavior can be profitably analyzed in terms of game theory.

NOTES

1.   We take all quotations of Poe's works from *The Portable Poe* [Van Doren Stern, 1977].

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