



ST. LOUIS BRIDGE MURDER*

by

B. K. Barry

A Charles Earl Short Mystery, Featuring the Earl Family Brain Trust

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Arrival in St. Louis

“What I love about the game, Judy, is the logic of it, the puzzle of it all,” Charles Earl, a distinguished professor of pure mathematics specializing in algebraic graph theory,” explained to his wife Judy. While Charles had a full life in academics, in teaching and publishing of research, he also had another life in the world of tournament duplicate bridge. It was, of course, the card game of bridge to which he referred.

Each year, the American Bridge Congress (ABC) holds three duplicate bridge tournaments in large hotels and convention centers across North America. Cities compete to get this business because, over the course of two weeks, it means a considerable cash input to the city and its local businesses such as restaurants and hotels. This time, the Earls were driving to St. Louis for such a bridge event, and they planned to supplement bridge with visits with academic friends coming to the tournament.

“Oh, look, Charles, I think that’s the famous Eads Bridge!” Judy exclaimed. “Yes, Judy, I guess I forgot that you hadn’t been here before,” Charles noted absent-mindedly, “the university at the eastern foot of the Eads Bridge, in Illinois on the eastern bank of the Mississippi River, is called ‘Catenary University (CU—or, ‘See-You’ as some of the locals spell it).”



“I came to St. Louis,” he continued, “when we were setting up the legal ground work for the chain of restaurants bearing your mother’s name—the ‘Alma Mater’ restaurant chain.” “Sure,” said Judy, “I remember that well—this one was the first one, in association with one of the greatest riparian confluences of them all: the Mississippi and Missouri. Well, at least we know one fine restaurant we can go to and have some classic French cuisine...it’s right across the river from CU built on the grounds of the terminus of the eastern end of the St. Louis pneumatic postal network—oh, Charles, this is exciting!” Judy loved to see academic connections to real world projects—and, Charles loved to show them to her.



Charles and Judy continued on a few blocks to their downtown hotel, also, as Judy noted, on the path of the former underground pneumatic postal network. “Charles, while you are at ABC Board of Directors’ meetings,” Judy continued, “I think I’ll poke around in the basement of the hotel and other nearby buildings and see if I can find any evidence of the former postal network.” “Well, ok,” Charles said in a concerned tone of voice, “but be sure you have your smartphone with you...I’d far rather be in Board meetings than on some subterranean safari, but whatever floats your boat!” Charles remarked with amusement. With that, the couple pulled into the hotel, checked in, and began to unpack.

Dinner with Bill and Sandy

“Judy, you know I contacted our colleagues Bill and Sandy with whom we taught at a university long ago and far away...” Charles stated. “Wow,” exclaimed Judy, “you remember that Sandy and I were practically inseparable, as were you and Bill!” “Yes,” mused Charles “quite remarkable really...I think that they are at Catenary U now...we shall see—whoops, we have a phone message...I’ll get it. Hmm...it’s from Bill—they want to eat dinner with us tonight at Alma Mater—OK with you?” “Absolutely!” Judy said, her voice filled with exhilaration. Judy thought that she was thrilled not only to see old friends but also would be thrilled to see their new restaurant for the first time. The idea of combining a sports bar, including trivia, lots of big TVs, a strolling magician, and other entertainments for the entire family, with an haute cuisine restaurant had

been one that intrigued her. Restaurants that specialize only in outstanding classical French cuisine typically have hefty price tags so one can only afford to eat in them infrequently; sports bars, on the other hand, are inexpensive but can attract a regular clientele that comes frequently. Judy had noticed that another nearby bar was often in the top 20 nationwide in trivia contests—the area must be a hotbed of trivia enthusiasts! The sports bar offers a needed infusion of such a regular, predictable, and continuing income stream to support the luxury of an adjacent elegant eatery with, at best, a sporadic income stream. All in all a win-win situation, the extended Earl family had hoped.

“Well, Judy,” said Charles, “here we are: Alma Mater Restaurant and Grill”—he enjoyed the double meaning associating both the classical reference to the college from which one graduates with the Latinization of Judy’s mother’s name. “Look, Charles,” noted Judy, “the skytop café is open now—must have splendid views of the river and of Catenary U—oh, and over there you can see how the sports bar segment must have been added onto the older pneumatic postal building which I guess houses the haute cuisine side—I wonder if they have shared restrooms or what the various access arrangements actually worked out to be given the issues involved in teaming up this unlikely pair of functions in an unlikely pair of structures—old post office and new state-of-the-art techy building—let’s go in and see!”

Bill and Sandy were already there—the couples exchanged expected hugs, greetings, and small talk about families. After a round of cocktails was consumed, dinners were ordered, and the first bottle of wine was placed on the table as the conversation turned to more serious matters. “Charles,” Bill said, “what do you know about the situation at Catenary University?” “Not much,” said Charles, “just what I see in CU publicity and what I read online in various documents—the Internet is in many regards the world’s greatest library, but there are few standards of inclusion and exclusion—that’s why we need fine academic librarians and suppose always will,” commented Charles. “Same old Charles,” giggled Bill while he poked Sandy. “No, seriously,” said Charles, “here’s about all I know. I gather that the university was founded relatively recently and that in many ways it

builds on the fine traditions of higher education already present in St. Louis. Certainly the Eliot family goes back a long way with T. S. Eliot's grandfather founding one of the great American universities here. I followed that because I think you may have known that my father had a Ph.D. from Harvard, and he chose my first and middle names, Charles William, in honor of Charles William Eliot, a member of that same Eliot family, who for many years was President of Harvard University." "Further," Charles continued in a dignified professorial manner, "St. Louis is also home to an outstanding Jesuit university—again, my family has had long and continuing association with the Jesuits in academics—it's kind of all brought together sitting here with you, our dear friends, in our family restaurant—all very sentimental," said Charles, now slipping into a more thoughtful, indeed sensitive, voice. Judy thought he might start crying—Charles was the one who could not watch a "chick-flick" without some sort of tearful outburst.



“Charles,” Judy said sharply, “we were talking about the idea of a catenary, weren’t we?” “Oh, yes, thank you for pulling me back on track, Judy” said Charles. “Anyway,” continued a more composed Charles, “I gather that CU was conceived as a technological university to factor in with the strong private and Jesuit approaches to excellence in the Liberal Arts. They train engineers and thus also have strong mathematics and physical sciences curricula.” “Yes, that’s the idea,” said Bill. “I have also read on the Internet,” noted Charles, “that the President is quite a character—not all that popular within the university but a real glad-hander and a terrific fundraiser.” “Well, there’s more to it than that,” said Bill, “but that is the tip of the iceberg.” “Furthermore,” Charles commented, back once again on his academic podium, “it seems to me that the university must have been named ‘catenary’ because the Gateway Arch is of course a weighted geometric catenary, inverted perhaps—capitalizing on the idea that a river reflects things so that’s why Catenary U is across the river. Hence, the CU slogan of ‘Catenary University: Your Gateway to a Higher Education’. Also, the logo reflects, literally, the Gateway Arch catenary.”



“Of course,” Charles continued in an even mathematical tone, “one expression for a simple catenary is as the hyperbolic cosine function, $y = \cosh x$, which is equal to $(e^x + e^{-x})/2$, and with the exponential function involved, then I thought that the CU President is causing exponential growth of the student body and of funds...at least from the data that I saw! So, then, I wondered, when I read that he had received a vote of no-confidence from both the student government and the faculty senate—how this could be—he is apparently a charming and energetic fellow, excellent at building the university—why the unhappiness within? And that’s about all I have thought about it or read about it...perhaps you can fill me in, Bill?” “I sure can,” said Bill, “one story, personal to yours truly, should give you

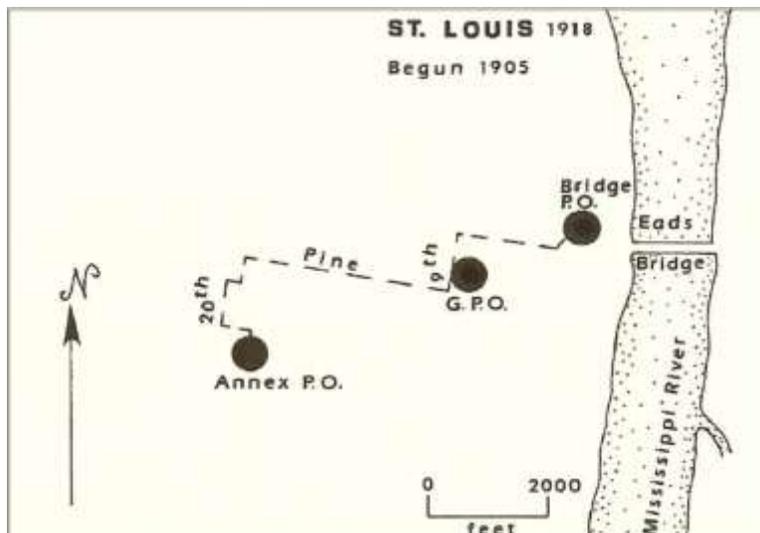
the idea—but Charles, you seem to be assuming that I am still at CU—I am not.”



“As you know,” Bill continued, “we all taught together a number of years ago and then, as often happens with young academics, we went our separate ways in pursuit of career goals. I left our shared university of that time a few months after you did to come to the newly-founded Catenary University. It sounded like an exciting prospect and a rare opportunity to be in on the beginning of a new academic venture—jobs like that seldom come along so naturally I leaped at it. My background in mathematical approaches to network analysis seemed to fit well with their mission: to train engineers solving real-world problems to think clearly about the mathematical and logical underpinnings of their science. It went well for quite a while; I had many students who found interesting applications of network analysis in the real world.”

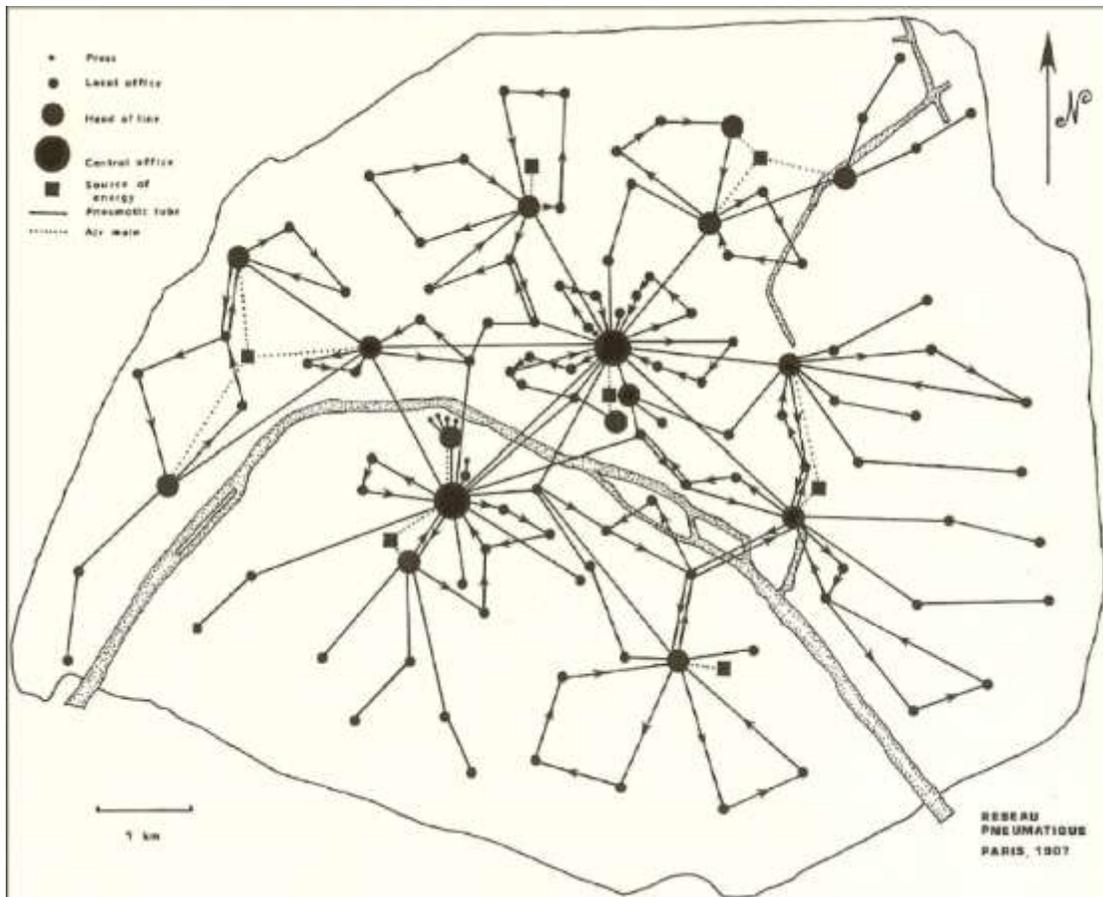
Then,” Bill went on, “a couple of years ago, a team of two particularly bright young engineers approached me about doing a project involving the Eads Bridge. They had found an old map of a relic pneumatic postal network that used to run under part of the downtown of St. Louis. Large carriers, about six inches in diameter, were used to supplement mail service in the days before the automobile and truck were introduced into the postal service. The metal carriers had leather rings on either end that pressed against the tubing and made a tight seal so that air pressure would build upstream and force the carrier, containing packets of mail in envelopes,

downstream to outlet tubes in various locations. I think you probably know that the eastern terminus of that network is under Alma Mater, the haute cuisine side.”



“Anyway,” Bill explained, “the students also found that there had been a proposal to extend the tubing across the Eads Bridge but that that proposal had never been implemented. They approached me to see if we might apply for a grant to implement the plan.”

“So,” Bill stated, “we applied for funding from a private foundation to pursue the possibility of implementing the project as some sort of mix of contemporary engineering and historic preservation—and possibly as an altruistic approach to bridging the digital divide. We were successful and received a modestly-sized grant; I foresaw promise of much greater things to come if the initial pilot studies bore fruit! One element of the proposal called for spending 9 months in Paris, France, to study the greatest pneumatic postal network of them all (albeit a bit different in physical structure), Le Réseau Pneumatique, sometimes referred to as Le Petit Bleu reflecting the little blue messages that were transmitted through relatively narrow tubing. So, Sandy and I and the students spent 9 months in Paris.”



“While in Paris,” Bill sighed, “my contract with CU came due. They sent it to me, and I signed it as usual—it was the same thing...I was continued as a distinguished professor of mathematics and network science. Then, three weeks later, I received another letter from the Math Department Chair, Sean, stating that this contract was to be my terminal contract!”

“Charles,” Bill continued, “you can imagine my utter dismay...here things were going so well, I had thought. So, when I got back from France, I went to see our President, Alfredo (‘just call me Al’ as he says), to question this bizarre situation. He confirmed that in fact this was to be my terminal contract and noted that he would use Sean’s inept handling of the situation to destroy him too!” “What!!” gasped Charles in amazement, “how can this be?” “Well, that’s what I felt too,” said Bill, “and as Sandy and I talked about it, we eventually came to the conclusion that since we knew the fault was not on our end, the best thing was simply to forget about the nonsense and get on with our own lives. So, we are now living about 250 miles from here where I have another distinguished professorship of mathematics at a prominent national university. But, that gives you an idea, Charles, of how votes of no confidence might have come about, from anyone who could see any of the inner workings of the administration.” “Absolutely,” said Charles, “I think I shall go check out this place for myself!” “Sure,” said Bill, “but I don’t think I’ll go with you. Sandy and I came here to have fun playing at the tournament!” And at that the two couples parted ways once again.

The Alma Mater/CU Social Network Experiment

Once they got back to their room, Charles checked his email and said, “Judy, let me show you the transcript of a digital audio recording that Bill just emailed me of the classroom antics of President ‘Al’ in a recent trip to Alma Mater—clearly Bill, while doing great both personally and professionally, is still upset by the way he was treated (as he managed to obtain this recent transcript).” “Wow, that’s fast,” said Judy. “Apparently Al, as part of his glad-handing and so forth,” continued Charles, “takes his students out to local restaurants (with Italian of course being his favorite) to study cross-cultural behavioral response patterns within social networks--to see how people in the service business react when presented with adversity or other out-of-the-box behavior. It’s quite interesting in certain ways and in fact you might even find it somewhat amusing if you imagine trying to put yourself in the position of being in a restaurant with someone behaving as Al does here...Here goes!” announced Charles.

“My good man, we need a table for 15 of the finest from the university. The round one over there in the corner should suit us well,” President Al commanded. “Yes, sir,” the accommodating host said. “You mean, ‘Yes, Dr. President’ my good man...I am the President of Catenary University and I expect to be treated with dignity and addressed by my correct title and not as some sort of random, ‘sir’,” asserted Al. “Yes, Mr. President. My apologies. I hope you will have a pleasant time at Alma Mater. Please let me know if there is anything I might do to assist you and it will be my pleasure to see that you are well served,” the host said in an even tone while ushering the group to their large round table and offering a menu to each of them.

“I will have bacon and eggs with a bowl of oatmeal to begin with,” Al told the waiter. “Sir, we have breakfast items only until noon; it is now 6:00 p.m.,” the waiter stated in a matter of fact manner. “But, I must have my oatmeal...and, your menu says you have it, so I want it and I want it now. Furthermore, you must address me as ‘Mr. President’ and not as ‘Sir’, young man,” Al complained. “So, what do you have to say...why can’t you make me oatmeal,” continued Al, “I want it and I want it now!” “Excuse me, Mr. President, I shall go see if the kitchen can handle it at this point,” the waiter said in a saccharine tone. “Mr. President, I have spoken with my superiors about this matter and they say that they need to keep a consistent approach and have available to you only what the restaurant is willing to make available to the random patron. That is our policy,” stated the waiter. “Well, all right, I suppose...now, let’s see, I think I will have the fried catfish. What kind of oil do you fry it in; I must have olive oil,” asserted Al. “I will check,” said the waiter. “Mr. President, we do not use olive oil for frying on a broad surface cooking vessel that accommodates a variety of dishes; the smoke point is too low and it will not work,” the waiter explained upon his return, “we must use one kind of oil for the entire surface and olive oil won’t work for that.” “Well, then I will go to the supermarket across the street, buy a cast iron pan and some olive oil and bring it back to you and have you take it to the kitchen and cook my catfish in it,” said Al. “Look,” the exasperated waiter said, “I am happy to serve you but you are beginning to try my patience—please, let’s see if we can find something on

the menu for dinner that you would like.” “Well, how am I supposed to know what I would like from a printout—I need to see real food—I’ll fix that,” said Al. And, with that, he got up, stomped around the restaurant and looked at the food of other patrons; he walked over to one table, bent over, stuck his nose an inch from the food and announced “that smells as if the cook didn’t wash his hands after he used the bathroom.” At another table, he looked at the duxelles sauce on a patron’s plate, ran his finger through it and noisily slurped down a finger full of sauce...”not bad,” he noted, “but it should have more mushrooms and they should be more finely and more uniformly chopped that they are here. Too bad they don’t serve the sauce here that is named for me, ‘Alfredo’ of course.”

At that, the waiter went to the manager to ask to be relieved from serving this table. “OK” the manager said, “I’ll send over David; he knows the President and has considerable experience handling ‘high-maintenance’ types.” The meal continued without incident.

“So, Judy,” continued Charles, “I heard from the manager that the restaurant picked up the tab for all affected patrons and offered them free lunch coupons for a return trip. I think it all got settled, but once again President Al got a vote of no-confidence...this time from the staff of Alma Mater Restaurant and Grill!”

Charles’s Meetings at Catenary University

“Judy, today I’ve made an appointment to meet with ‘Al’—I want to see what this guy is like, in person—study his body language...see how it tallies with his spoken language...listen to him more than talk to him and just generally study him. I’ll be back in the room in time for dinner I hope; if not, I’ll give you a call. See you later—my cab should be here any minute.”

After an uneventful cab ride, Charles arrived at Catenary University. “Hi, I’m here to see the President...have an appointment for 10 minutes from now. My name is Charles Earl.” “He is expecting you, Professor Earl. Please have a seat. May I get you a cup of coffee or a soft drink?” asked the friendly, stocky young man helping out in the office. “Sure, a cola drink would be good,” replied Charles. “Here you are, Professor Earl—it’s a real

pleasure to meet you in person—I am a mathematics major and I’ve read your seminal work on automorphism groups of graphs—quite a feat solving that major, previously unsolved problem!” noted the office helper. “Well, how nice,” Charles commented modestly, “for the most part my professional mathematical work does not draw a fan club! Tell me, what are you interested in? Do you plan to go to graduate school?” “Actually, I am interested in social networks, kind of a combination between social science and graph theory—studying patterns of connection in human communications and that sort of thing—my name is Brendan; I’m a Senior. Yes, I do plan to go to graduate school, sir. Oh, here’s the President!”

“How do you do, Mr. President? My name is Charles Earl.” “Yes, Charles, we were expecting you with great anticipation—but, please dispense with the formalities—just call me Al. Come on in to my office and let’s talk; then I’ll take you around a bit. I am glad you got to talk to Brendan for a bit; he is a fine young man and of course we are very proud of him. Please have a seat in one of the comfortable chairs and I’ll take the other one. Charles, I have followed your work over the years as your theoretical approaches relate to my more pragmatic interests involving communications systems and social networks. I am eager to tell you about some of the work taking place here at CU.” With that, Al ushered Charles over to the floor to ceiling windows and put his hand on Charles’s shoulder while pointing with the other hand “Charles, do you see that tower just to the left along the river?” “Yes,” Charles replied, finally being given a chance to get a word in, “it looks like a hyperboloid of one sheet.” “Absolutely, Charles, you are a man of fine perception as well as one of well-known integrity and brilliance—we are so fortunate to have you as our guest today, here at CU! And of course, as you know,” Al continued, “the hyperboloid of one sheet is a ruled surface, in fact doubly ruled, so that each point on the surface has two straight lines passing through it, making it structurally a very stable form—with cooling towers for power plants, such stability is of course critical.”



“We have our own power plant,” Al went on, “and supply all our needs in that way; you will also see numerous onsite retention ponds in which we capture rainwater and allow it to rest and then release it gradually to the river. We use a slight gradient to our cut-down curb and gutter system to direct a gradual flow to these ponds, as well as gradual overland sheet flow, so that we control local flooding possibilities here adjacent to the river—naturally, other governmental authorities deal with river bank and river issues. But we work very hard in support of those environmental issues and follow current practice in attempting to become both self-reliant and self-sustaining—a real ‘green’ university. We like to think of ourselves as thoughtful not only of our students, faculty, and staff, but also of the broader community and their goals, including environmental goals. The community responds by sending their young people here, and as word of our grand effort spreads, so too does our pool of talent as well as our endowment. We plow a lot back into furthering these altruistic causes and have been quite successful with this sort of boot-strapping approach at creating the extraordinary physical plant you see today—some of it, though, is underground in order to reduce the amount of impervious surface and consequent polluted runoff, but certainly I think you get the idea from looking at the part that extends above the surface of the Earth.” “Quite impressive,” noted Charles.

“You can imagine,” commented Al, “that a number of students have found projects at turning theory into practice in association with catenaries, arches, suspension bridges, hyperboloids and cooling towers, stream bank

erosion patterns and Bernoulli's brachistochrone characterization, and so forth...of course you are familiar with all that, but it is quite exciting for our students to have the entire 'universe-ity' as their laboratory. During the first two years, we try to make sure that students have a strong foundation in mathematics, English, and science. By the end of the second year, we want them to think about integrating elements of their theoretical studies into a real-world project of some sort. Then, in the third year, they may take specialized courses or may do field work of some sort in support of their project. Then, in the fourth year, they bring it all together in the form of a thesis or some other publication. We also focus during the first part of the fourth year on making sure that they have the skills they need to do well in their next phase, be it graduate school, the business world, or whatever. Students who do well here are often self-starters and are heavily goal-oriented and not terribly responsive to peer-pressure," Al continued as he carefully ran Charles through an overview of the curriculum. Charles thought that this was indeed the sort of man who no doubt was very successful at fund raising—if the listener were not taken in by all this superficial 'charm' and did not actually want to give funding to the cause, he/she might wind up giving just to get Al to shut up! "Yes, indeed," noted Charles, "your altruism is admirable, Al."



"Charles," Al continued, "you have a general overview of the university—might I indulge your kindness to listen to my pet project? One that draws the history of technology together with contemporary practice, in the context of social/communications networks?" "I'd be delighted to hear

about it,” said Charles. “Good,” said Al, “it’s about lunch time, let’s go to lunch at my favorite place, just at the other end of the Eads Bridge...we’ll drive across the Eads Bridge. The restaurant is named ‘Alma Mater’—an obvious connection of course with a university but I understand that there is a double entendre there...turns out the owners are an academic couple one of whose mothers is a fine chef and whose first name is ‘Alma’. It’s a deep dark secret who that couple is...I’ve tried to find out and failed...maybe someday, who knows.” Charles laughed inwardly as a gentle smile crossed his face; he would have to remember to tell Judy about this conversation—she would think it hilarious. “Remarkable,” Charles noted, “sounds like an interesting place with a fascinating story associated with it.” “Yes,” replied Al, “I generally go there once a week on the same day...the staff there on that day all know me, although recently I did go on a different day with a group of students...most of the staff was different then. Today is not my regular day, so we shall see...”

Luncheon with Charles at Alma Mater

“Hi,” said Al, “we would like to sit in David’s section, as long as he is not serving in the rooftop garden.” “Very good, sir,” said the host as he proceeded to seat the pair at an attractive table for four. “Charles, I insist that you be my guest for a fine luncheon,” Al said in a commanding voice, “I am quite familiar with the menu and would be happy to order for us, a set of small, but rich, dishes to share—OK?” “Sure,” said Charles, “whatever works for you...very kind of you. Thank you.” Al told the waiter, David, “we will have a bottle of Champagne along with Potage St. Germain, Salade de Tomates, and some nice French cheeses, whatever the best are that you have today--associated appropriate breads and so forth. For dessert we will have Poires Belle Hélène along with some Armagnac.” “Al,” that is quite an elaborate and expensive luncheon,” quipped Charles, “please permit me to contribute.” “No, no, no, I won’t hear of it, Charles,” Al insisted, “you’ll see...won’t cost either one of us anything.” Charles chose to say nothing.

“Now,” said Al, “I want to tell you about one particular project. Do you know that St. Louis once had a pneumatic tube mail service?” “Yes,” Charles

noted, “my wife, Judy, is interested in things like that, so I think I had heard about it although really I only know a very small amount. I gather that the hotel that is hosting the American Bridge Congress (ABC) duplicate bridge tournament that we are here for is located along the path of that network. Of course that network was a revolutionary way to deliver postal mail in the early twentieth century...it became outmoded when the automobile and truck became commonplace for delivery. Therefore, what was once an exciting technology had, before the end of the twentieth century, become a defunct technology.” “Charles,” Al said, “once again you display your erudition and breadth of knowledge. But, I must correct something...the service, while it was defunct by 2000, is now no longer defunct!” “Really,” exclaimed Charles, “tell me more, Al.”

“You see,” Al remarked, “the original plans called for a possible extension of pneumatic technology across the Eads Bridge. In the early twentieth century both the bridge and pneumatic technology were quite avant garde...seemed natural to forge them and build something even more than the sum of the two parts. But, that promise was never fulfilled...that is, not then...but, now it has been!” “Remarkable,” said a seemingly astounded Charles. “Yes,” Al continued, “a few years ago, I thought that the importance of demonstrating the possible synergy of forging the old with the new, as a way of helping to erase the “digital divide” would illustrate to nations less fortunate than ours that, instead of worrying about being left out, that they look to the stock of creations that had been unique to them in the past and figure out ways to use them as transformative forces within the contemporary technological context. So, I gathered together a team of students and we applied for a grant. At first, we had a small one and were able to send a small team to Paris to study the largest pneumatic mail network. That effort did not yield too much. So, I made a few appropriate personnel changes and then took over the grant myself so that I could insert my own research perspective on social networks. That approach netted me a substantial multi-million dollar grant and substantial international attention. It involved, among other things, the construction of the Eads extension of the St. Louis historical pneumatic network. I’m pleased to say that just recently all this work paid off: the extension is now

complete and functioning. We continue to test it of course, especially in conjunction with a partial restoration (funded by the grant) of the relic network, but so far so good.”

Al continued, “my colleague in the Math Department, Sean, has been helping with the testing phase, as has my assistant, Brendan, whom you met at my office. You might have a chance to meet Sean at the bridge tournament. He enjoys duplicate bridge and has been talking for the past year, at least, about a national ABC tournament coming to St. Louis. He plays with a woman named Nancy; Sean tells me that when Nancy comes to the table all heads turn and no one even notices that Sean is there. I think Sean views this situation as a huge advantage...that they get ‘gifts’ they might not otherwise see because Nancy’s good looks are such a distraction—and I gather that she tries to make the most of this distractive power in the way that she dresses!” “Well,” said Charles, “it sounds, from his name, as if Sean is Irish in background—if I see him, I will try to introduce him to our current ABC President, Ryan O’Brien—it would be swell to do so on St. Patrick’s Day, don’t you think?” “Charles, you have such a fine sense of humor,” Al noted, “but, yes, in fact Sean is of Irish descent—I went to high school with him on the south side of Chicago—he was from an Irish neighborhood and I was from an Italian neighborhood. We’ve known each other forever, it seems. I will mention your kind offer to Sean the next time I see him. Please feel free to contact me directly if you have thoughts about this project; I would value them greatly.”

David brought the exotic pear dessert and the two men enjoyed it along with their snifters of Armagnac. “A beautiful luncheon, Al—many thanks,” said Charles. “Sure thing—all paid for by my grant—it’s of research value to explain my project to highly-trained ears,” noted Al, “I’ll probably be back again tomorrow—it’s my regular day here, with David, Armagnac, and more.” Again, Charles kept silent but added to his stock of mental notes. Instead, he noted to Al, “I must get back to work and then to the hotel; today is the anniversary of my mother-in-law, Alma.” Al stared at Charles in a perplexed manner as Charles swiftly exited the front door and walked back across the Eads Bridge to CU.



A Visit with Sean

“Professor Earl, a great pleasure to meet you in person—just call me Sean,” commented the robust Irish mathematician as he extended a beefy paw to Charles. “Not only have I read your research on graph theory, but I have also followed your career in bridge, particularly in bridge administration. You see, my mathematical interests center on applications of graph theory in real world networks, so of course I have a natural shared interest with you in that regard.” “But,” he continued, “I was particularly eager to meet you in conjunction with our shared bridge interests. You see, here at CU, in order to put theory into practice, we often need to experiment in the real world. Now as you and I know, there are difficulties involving human rights and the experimentation, involving ideas, on human subjects—many legal snags can be encountered. We have had some difficulty with that here at CU—President AI has had some problems involving taking groups of students to private establishments and conducting verbal experiments to see how much abuse a social or business network can withstand. He runs on the edge with that—the last episode involved a problem at Alma Mater Restaurant and Grill. AI eats there frequently and timed his experimentation run to coincide with changes in shift so that he is well-known to one set of staff but not to another. Personally, I seldom eat there—can’t afford it—anyway, it’s not my thing. I like a soda pop and a chili dog for lunch myself—there’s a good

hot dog vendor outside this building—would you like one now?” “No, thank you,” said Charles, “I have already eaten lunch.”

“Anyway,” Sean said picking up the previous theme, “there’s a guy in the biology department here that has done experiments involving the effects coffee enemas on human health issues of various sorts—he uses students to do a variety of nasty jobs and promises them grades of A for doing the work and keeping their mouths shut...that one is also on the edge, and I think, over it.”

“But, what these things have in common,” continued Sean, “is the testing of systems. We all know, especially in our current swiftly-moving technological environment, that the testing of systems to stresses of various sorts is critical. Some of us use automated testing while others resort to different testing strategies. Personally, I tend to favor the automated approach, but perhaps that is the logic of the mathematician—maybe my colleagues in the human-oriented sciences prefer other approaches. Have you heard about our experiment to extend the historical pneumatic postal network of St. Louis across the Eads Bridge—to fuse historical with contemporary technology?” “I believe I have heard about that—fascinating and important research. All too often the lessons from the past evaporate as new people enter any system and too much time and effort are devoted to re-inventing the wheel,” commented Charles. “Yes, well-said,” noted Sean, “I used to be more involved in the project though I still am in the testing phase now that the physical tubing is complete—but, AI has moved me more into the administration of CU—challenges everywhere, I suppose.”

“Tomorrow,” Sean continued, “I look forward to going to the bridge tournament and playing with my regular partner Nancy—a real looker—we get a number of gifts, but she is a fine player independent of all that—at least, she plays as well as I do, so she is a fine partner for me. At our local club, we have been using bridge scoring units—you know, these wireless devices placed on the table that are designed to take advantage of contemporary technology to give real-time readout of scores across the

field. I have not been to an ABC nationals to see how they work there and so am looking forward to that, greatly! Three issues concern me:

1. The scalability of the wireless network.
2. Problems parallel to those of a wired network such as possible attenuation issues, that is, degradation of signal due to distance or other impediments.
3. Network security and the presence or absence of back-up systems.”

“Sean,” Charles said, “I really don’t know the answers to all of these concerns, but I do know that the technology scales well from the club level to the sectional and regional level and even to the national level. I do not know, however, the limits to scaling. As to signal degradation, I gather that walls and other solid objects greatly interfere with the signal transmission. I believe that the signal transmits well over a distance of about 300 feet of open space and then begins to degrade. On the security front, I think that the Director-in-Charge has the system passworded as one form of security measure...and of course there are security cameras present in many rooms. The cameras are a good idea; these small electronic devices are often left unattended in the playing area. But, you are right; it is a fascinating topic.”

Charles continued in an inviting tone, “my wife Judy and I would like to invite you up to the Presidential Suite in the hotel tomorrow between sessions for an Educators Reception; I think you might enjoy meeting our current President Ryan O’Brien. It would give you a direct chance to interact with leading folks in bridge administration. As you suggested earlier, there is a great deal in common between bridge administration and academic administration. There should be a good deal of food and drink, as always, but perhaps even more so given that it will be St. Patrick’s Day. The women who do the food and bar, Ellen and Sarah, are marvelous—you would have a wonderful time and also get to see the inner workings of bridge administration.” “Wow, Charles, fantastic idea! Of course I will be there—many thanks!” said an elated, Sean. The two men parted company and Charles headed back to the hotel to write down his mental notes from the day.

Bridge on St. Patrick's Day

“Charles,” said Judy, “we had a great time with old friends at Alma Mater—while you are playing bridge at the tournament today, I’ve made arrangements to go to Alma Mater with another old friend, Ann. She and I are having a late luncheon there; you know, she remembers my mother, and her terrific effort with haute cuisine, from when we were both in school together—it should be fun.” “Yes, Judy, it sounds terrific,” Charles commented while reflecting on a variety of bridge conventions he might play today. “I want to go today,” continued Judy, “before Ann and I both get heavily involved in our various duties with ABC committee work. “Right,” said Charles, “go for it. Meantime, I’ll head on down to the bridge game.”

“Charles, oh, Charles...over here,” yelled Sean, “I want you to meet my mixed pairs partner, Nancy.” “Hi, Nancy,” said Charles, “I’ve heard nice things about you from Sean; hope you will enjoy the event today.” Charles headed off to find his partner keeping his focus on his game; he had really been looking forward to this game and was geared up to win his first-ever national championship. Sean headed off to the room they would play in while Nancy bought an entry. Charles hoped that today the wireless scoring devices would in fact be working properly...they had not been doing so, at least in some of the sections, on previous days.

After four rounds of mixed pair play, Sean commented, “I’ll be back in a minute, Nancy—I need to check my text messages.” Five minutes later, Sean returned, “Nancy, this is one our very best students, Brendan—a Senior with a straight A average, very rare indeed—I have been called away suddenly to take care of a serious problem, in fact an emergency, at the university—please meet Brendan—he is a fine player who was kibitzing at another table; he’s helping me with systems testing as part of an independent study he is taking with me and has all that he needs with him to complete his phase of the testing—he will take my place this afternoon (I have already cleared all of this with the Director-in-Charge). I hope I will be able to play this evening and later drive you to the airport to catch your red-eye to the coast for your meetings. Sorry about this, but you may both be better off anyway...I’ll catch up with you later...gotta run.”

At Sean's table, Brendan took over Sean's north position. The tournament director called a hospitality break. Nancy took advantage of the hiatus for a bathroom break. Brendan checked his pockets to make sure he had what he needed to take Nancy to the airport and conduct testing as ordered by Sean. After he was satisfied with the arrangement of materials, he got mentally ready to take over at the bridge table, and also took advantage of the brief stop in the action to leave the table for a few minutes and went to look around outside the room as Sean had suggested. Soon, the tournament director called for the action to continue, and so it did. Brendan proved to be a fine partner for Nancy—they completed the rounds swiftly and without further ado.

After the last board of the afternoon, again finished swiftly, Brendan told Nancy that he would need to stay at the table and then absent himself for a few minutes to do as Sean had asked in terms of the network testing. Nancy, and the opponents, took advantage of the early finish to get some coffee and a snack. Brendan arranged things with regard to materials in his pockets sorting them out on the table. He reloaded his pockets and got up and left the room. After a few minutes, both he and Nancy returned from separate directions; others were still playing the last round. Shortly after their return, the Director-in-Charge got on the microphone and announced that once again the wireless devices had failed to transmit to the server, at least in some of the sections. He informed the group that directors on the floor would come to each table and read the cache in the individual units of the affected sections in order to retrieve the scores from rounds 6 to 13 and that therefore there would be a delay in the determination of results.

It became clear that Charles's hope at the outset of the game was not to be realized. The units had once again gone crazy, apparently due to some combination of transmission failure from the units on the tables to the master server perhaps caused by a combination of impediments to signal transfer—all within a hotel with an older digital environment. Charles smiled at the irony as he looked at his paper beverage napkin embossed on one side with the hotel name and on the other with a QR code. He thought of Sean and wondered if Sean were reflecting on the parallel of this

situation of lost communication in the wireless bridge world with similar degradation of signal in a wired environment caused by attenuation—signal degradation caused by cables of excessive length. Sean, however, was of course totally unaware of this situation as he had already left the tournament and was heading toward CU.

Luncheon with Judy at Alma Mater

Judy met her long-time friend Ann at Alma Mater, where they chose to sit in the rooftop outdoor café to enjoy a light luncheon. “What a spectacular view,” commented Ann, “the Arch on one side of us, the Eads Bridge across the river, and the nice new university across the river...looks as if some of the buildings might be underground...I love watching the river traffic...but, I do hope we will get to see some of the Clydesdales coming along the street, perhaps in a parade!” “Hello ladies. My name is David, and I will be your server this afternoon. What might I get for you?” They ordered a bottle of Dom Perignon, the Paté Sampler with Paté de Foie Gras and Paté de Campagne, and a small platter of soft, ripe French cheeses with a fresh baguette. Soon the drinks and cheeses arrived and David noted, “this is Laura; she is shadowing me today to learn more about fine service here. I hope you will not object. Please let either or both of us know if you have questions or concerns. Your remaining food should be up in about 20 minutes or so, but I thought you might like to get started now. The kitchen is a bit backed up.”

The women enjoyed the champagne and the cheese as they looked out over the river and relished, in silence, once again being together. Judy reflected on similar feelings as she and Ann had enjoyed high tea at a tournament in Canada. “So Ann,” said Judy, breaking the comfortable silence, “tell me about the current crop of horses that you have...” “Well,” said Ann, “right now I’m raising quarter horses.” After a bit, Judy mused “and if you have four of them then you have a whole horse...four quarters make a whole...ha, ha!” “Very funny,” Ann said sardonically. Before the somewhat silly, but fun, exchange could continue, noise from the street below drowned them out. When finally they could talk again, the ever-optimistic Ann said “well, that sounded as if a wagon broke an

axle...maybe the Clydesdales are down there...certainly there is a large crowd gathered around near the curb!” Judy moved tentatively toward the edge, which had a railing high enough to suit her; she carefully looked over. As she did, she lost it all...champagne, cheese, breakfast, and everything, right over the side. “REALLY, Judy,” noted Ann in a disgusted tone, “you are not that high up here and there’s a good rail....sit down and get hold of yourself!” “No, no, Ann, it’s not that at all,” said Judy, “...a man looks dead...he is lying in a pool of blood in the gutter...there is no wagon and there are no horses...”

Activating the Earl Family Brain Trust

Ann brought Judy back to the hotel just as the afternoon session of the mixed pairs was ending and explained briefly to Charles what had happened. Charles had already heard about the event; the staff at Alma Mater had texted him. Charles helped Judy to relax a bit and generally took charge. “You need to know, Judy, that the man who died was President Al,” Charles noted gently, “the police are questioning Bill, probably among others—it sounds as if Al had many enemies. Apparently Al was a regular at Alma Mater each week, like clockwork. He was there when you were and had just left the restaurant when he was apparently killed. Of course, the police are investigating the matter.”

“Judy,” Charles said firmly, “there are things I need to do associated with this shocking turn of events. I need to talk to various people. Soon, I need to go to the Presidential Suite, for one thing. Then I have to hustle back to work.” But, there are many other avenues that might be pursued, as well. Once again, I hope you will take charge of those, and invoke our Earl Family Brain Trust—I have already designated some St. Louis special agents for you. I’d like all reports back before the start of the evening session.” Charles knew that casting the situation in an abstract, seemingly playful, world would help Judy to cope with the nasty events that had begun to unfold around her. He needed to get her to channel her large imagination in constructive ways. “Introducing,” he continued with a grand gesture, “the Earl Family Brain Trust and Team of Special Agents Assigned to St. Louis!

Earl Family Brain Trust

		<p>Theodore E. Bear: A sedentary philosophically-inclined bear. Kind and thoughtful. A clear-thinker interested in the balance between pragmatics and abstraction. He worries about personal issues, such as being made into the bed, as well as broad-ranging issues involving world peace and global politics among all creatures, real and imaginary. He views himself as a dignified and proper teddy bear wearing a tuxedo—NOT as a panda. He is a native of Detroit, MI.</p>
		<p>Binker Bear: Named after Christopher Robin's [A. A. Milne, <i>When We Were Very Young</i>] "imaginary" friend Binker, as in "you can't see Binker." He lives largely in the realm of the imaginary, in the world of abstraction. In his "bear" persona he is physically quite large; he has a number of other personae he has been known to adopt. He is known to keep his cards close to his chest. Binker is originally from Paris, France, and was born at Galeries Lafayette.</p>
		<p>Tine E. Bear: Named for his diminutive stature. Tine focuses on the pragmatics of life. He feels he has to do so...as a small creature in the world of giants. He enjoys playing duplicate bridge, as an equalizer, and has a fine partnership with Binker who is large enough to use a bidding box. Tine emigrated from Paris with Binker, but is originally from a US Zone in Germany (as his tag says). His genealogy is rooted in the Vintage (mohair) Branch of the prestigious Steiff Family.</p>

Earl Family: Special Agents Assigned to St. Louis.



Almer Bear: A native of Chicago—Almer is the mascot of the Alma Mater chain of restaurants. He has been known to enjoy his share of haute cuisine and is capable of holding his own in the most erudite discussion of fine food and beverage. He makes periodic visits, involving quality control and other matters, to each of the restaurants in the chain.



Ludwig von Bearthoven: A native of Troy, Michigan, and a member of the illustrious Gund family. Ludwig is from a musical family and serves as the corporate Director of Entertainment for the Alma Mater chain. He also has considerable “undercover” experience as his soft hugs have lulled many to sleep. This experience translates elsewhere in a natural manner.



Im PossumBle: A native of Ann Arbor, Michigan, where he was handmade by a specialist. Im is an expert at both “hanging around” and at dealing with situations which might otherwise appear impossible to handle. He has been known to hang out at Alma Mater restaurants although that fact is often discovered only afterwards. He serves as a consultant in matters involving corporate restaurant spying and has even had a role on a mass media production that shows hidden cameras revealing restaurant and server inadequacies.

	<p>Eeyore, Baudet de Poitou: Like Binker, Eeyore is also named after a character from A. A. Milne’s classic children’s work and like Binker is originally from Paris’ Galeries Lafayette. Eeyore worries about his tail, of course, but in recent years has learned to enjoy greatly the fact that real-world versions of himself, an endangered species, are once again rising in number. He is a kind and thoughtful, though stubborn, creature. His plodding ways and stubborn persistence, along with his gray coat, make him an ideal undercover agent in complex, but physically bounded, situations that appear drab in color. He has a background in problems associated with the hauling of materials. Eeyore persists until he gets to the bottom of things.</p>
	<p>Guillaume R. Squirrel: A linguist who is the Master Teacher of all languages to all teddy-type creatures in the Earl world. Guillaume is highly articulate and will chatter endlessly on a vast array of topics—some of greater interest than others. He claims to possess a copyright and trademark on his unique pronunciation of the word “hmmmmph!!” which he uses to express a variety of feelings. Guillaume’s gray coloration, along with his natural athletic talent and structural engineering background, make him an ideal undercover agent in a variety of environments. Guillaume, a world traveler like some of the others, emigrated from Toronto, Ontario, but was born in North Korea.</p>

The Investigation of Possible Solution Paths

Charles provides assignments to the St. Louis special agents.

“All right, guys,” Charles said to the assembled group, “here’s how Theodore, Binker, Tine, Judy, and I think we should proceed. In addition to things at the bridge tournament, there are three key areas to investigate: Alma Mater Restaurant, the pneumatic network, and Catenary University.” Each of you has a new smartphone.” Charles continued, “we want Guillaume and Eeyore to handle the pneumatic tube network and perhaps CU (text me if you need me). See if you can find the historic network. Find the new one over the Eads Bridge. Are there remnants of the historic network? Do they still function? Guillaume’s size and agility should be very helpful in that regard. Eeyore’s knowledge of hauling practices in the 20th century, and his brute strength, should also be very helpful. Basically we need to check out that what we are told exists, actually does exist—

there seems to be a lot of funding tied up with it” “Then,” Charles noted, “we want the rest of the special agents to go to Alma Mater, the site of the disaster: Almer, you keep your ears open and see if you note anything out of the ordinary in the recent past involving staff or patron behavior in regard to food or beverage knowledge (or lack thereof)—anything, however small, that might seem a bit out of place. Ludwig, we would like a similar report from you but in regard to entertainment rather than in regard to food and wine. Finally, Im, I think it would be good for you to hang out in the kitchen...it’s hard for the others to be in there in an unnoticed capacity but it should be easy for you. The staff will be looking at the food and not at the rafters...hang from a rafter, a pipe, or some such and again report on anything out of the ordinary.” With that the group disseminated and headed to their respective assignments.

Investigative reports of the special agents.



Report of Special Agent Almer.

I spent time in the dining area, talking to the host who seats people and generally circulating among the seated patrons. In addition, I had some opportunity to shadow the wait staff. I chose mostly to shadow their best and most experienced waiter, David. I think you already know that President Al went to Alma Mater a few weeks ago with a group of students and made a real pest of himself conducting some sort of weird social networking experiment to demonstrate how staff might react to obnoxious behavior. Other than that, he was there for lunch with you (the day before he died) and then of course the final time. That’s about all I picked up with regard to Al’s activities—nothing out of the ordinary for him. As to food, you know what Al ate with you. For his last meal, Al had Entrecôte and

Pommes Frites, you know, a form of sirloin steak and fries; I gather that when he came with someone he wanted to get money from or otherwise impress, that he ordered expensive items. But, for his regular weekly visit usually had something simpler, as he did that day. By, his eating choices, it appears that Al had no premonition that disaster was about to strike.

In addition, the wait staff was laughing about some other guy who came in some time shortly before Al did and ordered a glass of “Armoire” as an after-lunch drink. I gather that the host was good about correcting him although David told me the fellow was quite insistent about the name because he said his boss always had a glass of it.

David also mentioned that his “shadow” that day had been the one he had recently acquired, the would-be waitress, Laura. So, I also talked to Laura; she had little to offer. I gather she is a student at CU with interest in the Eads Bridge pneumatic project and may be involved in some testing of it—I worked a bit with Im on this issue and will leave that to him for his report. From what I saw, I am generally quite impressed with the way that restaurant is run: a fine group of young folks serving outstanding food and fine beverages—they all seem to know their stuff.



Report of Special Agent Ludwig.

I heard the same set of stories as Almer. The lighting in the place is quite good, clearly bright enough to see one’s food, yet understated enough to permit entertainment of various sorts. Of course, both the pattern and the intensity of light can be adjusted to respond to various entertainment requirements. I gather that there was nothing special regarding the lights when Al was there for the last time. So, visibility should have been quite good at normal lunchtime, mid-afternoon lighting.

During the time I was there a fine magician had been hired to go from table to table—apparently he works there on a variety of afternoons, through dinner, in an effort to draw family trade. He was really extraordinary; I tried not to lose my focus but the way he seemingly pulled light bulbs out of my ears was quite something! The young children enjoyed him, but I think many of the adults enjoyed him even more. I know I would go back there just to see him; then again, entertainment is my thing! Apparently he was there when Al was there. I gather that President Al seemed to enjoy him as much as anyone did; and I was told that quite a crowd had gathered around Al's table when the magician was there, each one wanting a different balloon animal...all very cute. Al left before the crowd around his table had dissipated; next thing they knew, he was lying dead in the gutter. The area was quickly cordoned off, so I couldn't get a really close look even though the event had taken place several hours before I got there.



Report of Special Agent Im.

While I was hanging around in the kitchen, I saw nothing unusual in the preparation of the food. It all seems to be carefully done and of course I assume the kitchen meets code—all seemed quite clean. The staff seemed quite careful about washing their hands and also fine in the way they handled food to avoid cross-contamination of any kind.

I was, however, glad to hear that Almer had talked to Laura. Some aspects of her behavior seemed a bit different from that of the other servers. I

found the terminus of the historical pneumatic network there. It appears that the network still works. Around dinner time, two pneumatic carriers (you know, one of those cylindrical containers like we see at banks these days) arrived. Laura took each one out of the old tubing and placed it in a newer tube and launched it off, elsewhere.

So, I texted Almer to have a conversation with Laura devoted to this topic—separate from his routine investigation. Almer texted back that Laura’s strange actions were all part of the testing of the Eads Bridge pneumatic tube in association with the older network. Her manual transfer of pneumatic carriers from the old to the new tubes was one non-automated factor in the CU testing of this extended technology.

The local manager at Alma Mater was happy to support this experiment in higher education. He saw pneumatic technology as one that has some ‘green’ components, and of course vastly preferred this sort of scientific testing to Al’s earlier abusive experiment with his staff.



Report of Special Agent Eeyore.

Well, here I was enjoying a nice shower and singing my favorite song when Guillaume texted me to meet him in the lobby. I got out of the shower, shook myself off, and plodded on down to the lobby. Judy had told me earlier that she had noticed large regularly-spaced grates in the sidewalks outside the hotel. We supposed that they might provide an air exchange for some sort of underground network. So, Guillaume and I headed outside

to look the situation over. I was able to pick up a grate and lower Guillaume down to a ledge below the sidewalk. He texted me that in fact we had found, through Judy's keen observation and deduction, a way in to the historic pneumatic network. He noted that in addition to the tubing that was suspended in tunnels, there were footpaths apparently for maintenance of the networks and perhaps of materials that might get flushed in from gutters, in-wall vacuum systems, and the like. He told me to come on down, too. Well, it's not easy for one of my girth and stiffness to get down there, but I did so—reluctantly, I'll tell you. But I supposed I had to support my friend and I do like to give things a really thorough checking out.

Soon after we were situated below the streets, we heard a swooshing sound—a pneumatic carrier travelling through a tube. It was quite thrilling to think that this network built over 100 years ago in the bowels of St. Louis could still function—even if only in some limited manner. We watched but did not see another one come by. So, we decided to walk along the path using the light from a smartphone to guide us. Guillaume hopped up on my back and we trudged along, sort of like my distant ancestor “Sal” who walked along the banks of the Erie Canal as she and others helped to haul barges using tow ropes. After a bit we came to a place where there were some empty pneumatic containers and what looked like a place to put them into the system of tubes.

Well, that Guillaume is such an adventurer! The next thing I knew, he had crawled into a cylindrical pneumatic carrier and was asking me to close the lid and launch him into the system by giving him a push (we supposed that if we were above ground, gravity would launch the carrier). He said he would text me when he came out on the other end. It was against my better judgment, but I did as he asked—as I gave my friend a gentle push, I worried that he might wind up losing his beautiful tail out the back...or worse. So, I went back up to the light of day so I could receive his text, trotted on back to the hotel, and sat in the lobby. I was worried sick about the fate of my dear friend.

As I awaited a text from Guillaume, I reflected on the events of the day. Sometimes it is good, even when one is worried, to sit down and try to put things in a logical perspective...I was sorry Theodore wasn't there to help with this. Just as I felt I was getting my act together, my smartphone beeped. It was a message from Guillaume! It was one word "hmmmmph"—that meant he was ok and acting like good ol' Guillaume. He sent a photo and of course it had latitude and longitude coordinates attached. I presumed it was a photo of where he was. I knew we could find him. I texted him back to stay put and told him that help was on the way—that I would use my Global Positioning System software to find him. Then I went upstairs, got my saddle bags, and headed on over to the appropriate geographic coordinates.



Report of Special Agent Guillaume.

Thank goodness Eeyore came to the rescue! It turns out that I was in some sort of storeroom in the underground area of CU. After I got in the tube when Eeyore gave me a push, I was dumped out, still inside my pneumatic carrier, in a kitchen. Then, some young woman picked up the carrier and I thought for sure she would look inside and help me out. Hmmmmph!! But, NO! She didn't even look! I saw Im hanging around, overhead but didn't indicate anything for fear of blowing his cover. The woman just shoved me, inside my carrier, into another pneumatic tube and I took off again, but much faster this time. In no time at all I landed in this storeroom. An automatic arm of some sort pulled the carrier out of the tube, lifted the lid, and with a fork-like hand, reached in and picked me up and dropped me in a bin that also contained a small package in a manila envelope. First, I texted Eeyore. Next, I was going to look in the envelope,

but just then I heard someone coming. So, I scampered into a hidden spot and a person came in and did something. When I checked, it turns out he/she had emptied the bin—taken the manila envelope away somewhere. Six minutes later, the person returned—I think it was a man, but the storeroom was pretty dark—no windows (apparently underground), only light from the door left ajar—and I really didn't want to use the light from my smartphone when someone else was in there. But the shoes appeared to be large men's shoes, so I assume but do not know, that the person was male. Anyway, he put something in a wastebasket and left, muttering to himself something about getting out of here. About 15 minutes later, Eeyore arrived. He was indeed a sight for sore eyes. I told him about the wastebasket, so he reached in and scooped out the package. It looked like the same manila envelope I had seen earlier in the bin where I was dumped from the pneumatic tube. I told him to put it in his saddle bag; I hopped in the other saddle bag, and we returned to the hotel. It was quite an adventure—the tubes might have possibilities as some sort of an amusement ride for folks my size...but, the system needs to be made more pleasant than what I experienced...I can tell you that!!

Charles's Report

After I left Judy and the Team, my time between sessions of the mixed pair was split between making an appearance in the Presidential Suite for a between-session reception for educators and talking to tournament directors. In my capacity as a technology expert on the national Board of Directors of the ABC, I needed to consult with the Director-in-Charge, Eric, about the unfortunate events of the day involving the transmission failure from the wireless scoring units.

In the Presidential Suite

I found Sean near the elevators, poring over the hand record from the afternoon game. I asked him casually how he did and escorted him to the Presidential Suite where he and Ryan (ABC President) exchanged casual chit-chat about the luck of the Irish, bridge, St. Patrick's Day, and so forth. Ryan was always a genial host. Ellen showed Sean around to the various

tables loaded with delectable food tidbits and then took him to the bar and introduced him to Sarah, who happily got him an Irish beer. Meanwhile, I was talking to Ryan about the unfortunate problems with the wireless scoring units. When I saw Sean coming over, I thought it was probably best not to talk shop in front of him so went to him and sat down with him. He wanted to go over the hand record one hand at a time, and we did so. We compared results, one for one, and also as if we were comparing board-a-match convention cards and International Match Point convention cards. I think he enjoyed that very much. I also introduced him to a few world champion bridge players who were in the Presidential Suite that evening as well as to an astronaut who was there. He seemed to get engaged in conversations with them, so I left to go about my duty downstairs with Eric, the Director-in-Charge. Sean said he planned to stay in the Suite until shortly before game time and then go back to the second session of the mixed pairs.

Wireless Scoring Units

Eric told me that apparently there were more than the usual number of “Director” calls in the later part of the afternoon session. He said that when the transmission from table-top wireless scoring unit is working properly, it is largely an automatic process; that when floor directors are not overly busy, they may check that it is working properly, but that when they are busy elsewhere, it runs largely unattended. The latter situation is apparently what happened during the last half of the afternoon session in the mixed pairs. Thus, the transmission failure which began in round 6 continued, unnoticed, until the end of the game.

When such failures arise, each machine must be checked manually to extract the results from the memory cache in the machine—the individual entering the score does not know that it failed to transmit. While it takes only 3 minutes for a director to extract the scores from the cache of an individual machine, there are many machines in use. This afternoon, for example, there were 169 tables in play in thirteen sections of 13 tables each. The units in six sections were affected; that’s 78 tables. So, instead of having real-time instantaneous scoring, which is what we have when the

system works properly, we had a delay of at least 234 minutes to account for. Naturally, the more directors involved in reading the caches, the faster the scores get out.

I stayed down on the floor with the directors to study the whole situation for as long as it took. Eric was able to marshal the services of 3 other directors and they had the situation under control, after somewhat over an hour, just before the start of the evening session. The affected units appeared to have been those farther away from the server, which was partially blocked anyway by a marble floor-to-ceiling column: “attenuation” in the wireless world. Only one unit appeared different—it had no scores in it at all, not even from the first five rounds. That anomaly appeared to be attributed to the location of the unit on a table distant from the server and behind a pillar that went from floor to ceiling of the ballroom—so a double column blockage. So, scores for that one section were delayed even longer as the directors sought to find players from that section who could fill them in with results. In the worst case, they would have had to wait until the start of the second session to find players to fill in gaps. Technological failure may offer a variety of surprises. I had hoped I might pick up some tidbit that would help us to unravel the nasty events of the afternoon that were not yet widely known.

Charles’s Theory--Putting It All Together

I have a simple statement from the Police: Al was knifed in the back with his own steak knife at Alma Mater—perhaps some sort of literal statement of giving back, to someone whom he had figuratively knifed in the back. Anyway, the knife was wrapped in a napkin so there are no finger prints on the handle or blade. Apparently, he was knifed at his table in the middle of the crowd watching the magician; he got up, staggered out, and fell into the street. The police found droplets of blood on the floor from Al’s chair, leading to the curb. Some sort of professional analysis was needed to confirm that these small areas of discoloration on the patterned carpet of the restaurant were in fact human blood, and not steak juice, catsup, or some other food material. So, our murderer must have been present in the crowd.

There are plenty of people who could not stand Al. Like many “heroes” there were those who loved him, those who hated him, and very few in between. Our dear friend Bill is course a primary suspect; Al fired him for no apparent cause and did so in a particularly vicious manner. But, Bill’s story checks out; he is doing better now than ever before; I believe him and I know in my heart that he is innocent. But, I know I must be able to offer objective and logical support for those feelings. Only then, will I offer my theory to the police.

There are of course many who had good cause to dislike Al: the head of the Faculty Senate at CU; the head of the Student Government at CU; some of the wait staff and management at Alma Mater; and, no doubt, a host of others with whom Al came in contact. I found him to be an affable and charming man in some ways. Yet I was equally certain that he was a liar who twisted facts to fit his own preconceived agenda and to cloak his distortions in an air of altruism...a very dangerous man.

Naturally, the police will focus on his connections at the university and will look at alibis in relation to university activities (teaching classes and such). But Judy, you and I both know that university professors have tremendous flexibility; classes are easily replaced with take-home exams and so forth... there are no rigid hours when one has to be on campus. Many outside the academic profession do not understand that individual accountability is what drives successful universities, and so it is particularly heinous when that trust is violated. We are held to higher standards of personal accountability than are many others, especially as we serve as role models in all regards for the best and brightest that are coming along as the future. We are, in some respects, always on call.

So, if someone in the academic arena had motive sufficient to plan to kill Al, might he not look outside the academic environment to some more structured institution in order to create an alibi that would be easier to verify than an alibi within the flexible academic institutional structure? An ABC National Tournament is a highly structured event...perhaps just the sort of institutionalized structure that might offer an academic the sort of needed alibi structure to commit premeditated murder elsewhere.

Then, we return to the question of motive. Again, I focus on the concept of risk-benefit analysis. To risk murder is to risk one's own life. Almost always, the risk vastly outweighs the benefit and so murder is an uncommon event. In my mind, only two individuals at CU might have motive—a situation in which the benefit might outweigh the risk. The heads of Faculty Senate and Student Government, as well as many others no doubt, certainly did not like Al. But they had channels, as in votes of no-confidence and such, to express their dislike. For them, as well as for folks working at Alma Mater, the risk greatly outweighed any benefit so I no longer looked there.

That left two candidates: our dear friend Bill, and his former colleague, Sean. Each might have had similar motives: Al had stolen the Eads Bridge pneumatic tube project from them. First, Sean stole it from Bill and got Al to fire Bill. Then, Al stole it from Sean and marginalized Sean's role on it. Meanwhile, Al pulled in multi-million dollar grants in association with it, got fine students to work on it, paid himself a handsome consulting fee on it, and generally turned himself into a local hero in association with it...Al used the project to boost enrollments, to get personal and institutional national media attention, and to obtain favorable international press coverage. Often, this coverage cited the work of this altruistic and heroic Midwestern American university president who was doing pioneering research on the digital divide and doing it in a manner that would benefit the peaceful, global interchange of information. I gather that academic gossip had it that Al might have been in line for an award from an international selection committee in association with the world's greatest existing Peace prize.

Surely both Bill and Sean must have been more than a trifle irritated that their work had been stolen and that Al had attempted to destroy them professionally in order to glorify, and in an academic sense, deify himself. Indeed, Al had even co-opted Sean's pet student, Brendan—who adopted Sean's manner and style of dress as is often the case with students who admire a professor--as his own personal assistant. Bill, however, had gone off on his own and was enjoying great success elsewhere. Bill's clear and

sensible account of what had happened here made sense both before and after I talked to others. So, I turned more of my attention to Sean.

But with Sean, we have to wonder how he can be in two places at once—both at Alma Mater and at the hotel playing bridge. Doesn't the fairly rigid structure of the bridge tournament offer him an alibi? Here is where the evidence that Judy and the Team assembled becomes critical. Let me show you how it might have worked.

Recall that Guillaume and Eeyore brought me a packet that had been sent through the combined old and new pneumatic system, ostensibly as a part of the testing of this system. Sean told me that he believed in the importance of the testing of systems and in particular of automated testing of systems. So, when Guillaume rode the length of the test track, he hit one snag in the automation of the testing when he got into the carrier and needed a shove from Eeyore to get started...that part, whether the start was from below ground with a physical push or from above ground with an assist from gravity, was not automated. Nor was the transfer of the carrier from the old system to the new system. Laura, the trainee at Alma Mater, was part of the testing team of the Eads Bridge project and AI paid her from his grant to serve as the human interface necessary, at least for the time being, to transfer carriers from old to new technology. She did the job she was paid to do, and although might be viewed as some sort of accomplice, in fact was truly innocent of any deeper wrong-doings. Looking inside the carrier was not on the agenda that Sean had given her and that is why she did not react to Guillaume. Once the carrier arrived in the Math Department storeroom at CU, automated equipment emptied the carrier, moved the contents to a bin, and shoved the empty carrier back in the tubing. Guillaume witnessed how that works and his observations in that regard are important.

But what Guillaume and Eeyore did that was critical was return the package that arrived shortly in advance of Eeyore. I opened it and saw that it contained a wireless scoring unit. Thus, it did appear that someone with access to the Math Department at CU had wished to know what was going on at the bridge tournament without being present. Again, either Bill or

Sean would fit that picture, presuming that Bill could still have keys if he wanted them.

Im's work confirmed Laura's role in the testing of the equipment at Alma Mater, while Ludwig's observations explained how the murder took place, in a crowd distracted by a magician. One seemingly innocent tidbit from Almer, however, made it clear to me, again, where the logic must point. He noted that someone had ordered a glass of "Armoire" as an after-luncheon drink. My colleague Bill, who had recently spent nine months in Paris, would never have confused "Armagnac" with "Armoire"—a ridiculous confusion of brandy with a dresser/closet—and, Sean had told me that he did not generally eat at Alma Mater and apparently preferred hot dogs and beer to French food and wine. So, my mind was now swinging heavily toward Sean. Still, I did not have what seemed to my mathematically trained mind as "proof."

So, I took the wireless scoring unit to Eric, the ABC Director who is the expert on these systems. I needed to check on how to extract the content from the cache. He showed me how, it was as I had thought, and he also did it himself. What we both found, independently, was that this unit had been keyed to Sean and Nancy's table. Now, I was convinced that it must have been Sean who committed the murder, but I wanted to tie as many loose ends together as possible before turning everything over to the police.

Nancy had returned from her trip to the coast. She told me about Brendan filling in during the afternoon for Sean; no doubt Sean had chosen Brendan, in particular, because a casual observer looking at the pair, and focusing on Nancy, could have easily mistaken the younger Brendan emulating his mentor, as Sean. She said that when she read about the murder at CU, she assumed in retrospect that the text message that Sean said he got regarding an emergency at CU was after the murder...and not that Sean was going to cause the emergency!

Follow up with Brendan revealed that Sean had promised him an A in the independent study if Brendan did as Sean asked; and, he threatened Sean

with destroying his perfect average and opportunities for a fine fellowship to graduate school if he did not do as Sean requested. In fact, I had to pressure Brendan myself, telling him that being any sort of an accessory to murder would be far worse than losing a few points on his grade point average...he was smart enough to see that!

So, he said that during the first hospitality break after round 4 Sean had given him an apparently empty wireless scoring unit to carry in his pocket. It would have been a simple matter for Sean to pick one up before the session, perhaps when Nancy was buying an entry. Sean knew, from my conversation with him yesterday, that he should get one from the tournament hotel site (rather than from his local club) because it was likely they had all been passworded together under a single user name. Sean could have easily kept it in his pocket during the first four rounds and then handed it to Brendan after round 4, during the hospitality break. Sean instructed Brendan to continue entering scores into the unit already on the table. Then, after the last round, Brendan was to remove the device on the table and replace it with the empty one from his pocket. It would have been easy to do this; Brendan was alone at the table and everyone else was too busy to notice. Brendan had been told to make the transfer out of the line of sight of the evident security cameras—Sean assured Brendan that it was all set with the tournament officials and so there was no need to cause a frivolous disturbance by commenting or asking questions. Brendan was then instructed to send the wireless device from the table, to Sean. He was to use a provided manila envelope, and then put the envelope into the entry to the relic pneumatic tube network, near the men's restroom, that Brendan checked out during the hospitality break. He was to transmit the material sometime after the game was over, but well in advance of the evening session. Brendan did so, functioning under the assumption that all the directions of Sean were ethical and part of the testing of this system that was not yet fully automated. Brendan was serving the above-ground role of launching a pneumatic carrier that Eeyore had assumed below ground.

Sean must have returned to CU following the murder and taken advantage of the flexibility afforded by the academic environment. No doubt, he talked about having been in the underground testing lab for the past few hours or

some such, and then went about university business as usual for the rest of the afternoon. He might have noted that he had been checking up on the testers at the bridge tournament and at Alma Mater and that he was going to continue doing so in the coming evening. There are any number of plausible comments he might have made. Then, when the staff left for the day, he headed to the underground storeroom/lab area where he found the wireless scoring unit, as expected. He quickly extracted the content, threw the unit away, and headed back to the tournament site with a convention card full of scores. He had to have the information prior to returning to the tournament, otherwise he knew he would risk being exposed by his ignorance of the later boards. He knew nothing of the transmission failure from the wireless scoring units.

Sean's plan might have worked if there had been no transmission failures. The directors would never have noticed that one unit was empty and different from the others. They only looked at the individual units in advance of the evening session because they needed to do so to extract the scores. They were under great time pressure to do so, and because they attributed the totally blank unit to some vagary of technology failure had not bothered to record which table it had been associated with. When the evening session started all was reset and that evidence was destroyed.

Had the scores been transmitted in the expected wireless pattern, as they had been in rounds 1 through 5, Sean would have been home free with a clear alibi of having been there. Sean knew all the scores—he had discovered, at his local duplicate club, how to retrieve them quickly from the unit's cache—the six minutes that he had the machine out of the storeroom was all he needed to get the information and enter it on his convention card; then, he could converse with the finest about the game of the afternoon; no one would think to question him or Nancy about a murder at a restaurant a few blocks from the hotel. The units would have been reset as usual at the beginning of the evening session and no one would ever have known that one of the units had been different from the others. Sean had constructed a "perfect" plan: it was the failure of technology that did him in!

Even so, Sean might have recovered from the unexpected transmission failure if only he had known of it. Brendan might have texted him, but Brendan thought nothing of the transmission failures as he was innocently following instructions exactly as commanded—a short-coming in Sean’s abuse of a student. Had the transmissions for the afternoon gone as expected, it was a reasonable plan for Sean to throw away the wireless unit at CU, where no one would think anything of it, in the trash which probably often had any number of strange-looking technological items in it. If instead Sean had taken the “liberated” unit back to the game, and replaced the blank that was there with the real one that had been there, Guillaume would never have found the liberated unit and the Directors might never have found the blank—and, but for a seemingly inconvenient misfire of technology, Sean might well have gotten away with murder.

* All characters appearing in this work are fictitious. Any resemblance to real persons, living or dead, is purely coincidental.