



Photo: Mark Hesketh-Jennings

Arthur Benjamin

Mathemagician

interviewed by Will Houstoun AIMC

Arthur Benjamin $\mu\mu\mu$ performs a unique act that combines mathematics and magic and which has given him an enviable reputation in both fields. In December of 2007 a performance Arthur gave at a TED conference was put online and, since then, it has been viewed over five million times. After appearing at The International Magic Convention, Arthur sat down with me to discuss maths and magic.

Will: You perform a very specific type of magic, that you call Mathemagics. Can you give the readers, who might not have seen your show, some idea of what that is?

Arthur: Basically I perform what a century ago were called lightning calculations. I demonstrate that I am able to multiply large numbers in my head, faster than a calculator. If you give me your birthdate, or any date for that matter, I can tell you what day of the week it was. I also perform a magic square, similar to what many magicians might do. Essentially they are all amazing feats of mental agility.

When I do a straight show I just show off, but in a lecture or a speaking engagement I follow-up the show by explaining how the calculations work. I am one of those magicians who loves to explain what I do.

Will: Right. But in your case, when you explain it, it really enhances the overall show.

Arthur: Absolutely. I do think the explanation is just as interesting as the performance, I wouldn't do it otherwise!

Will: One thing I remember that illustrates that point is the part in your show when you square a five-digit number out-loud, so that the audience can hear what you are thinking as you work. As part of the calculation you start to use words, as part of a mnemonic memory system, and I imagine that many people in the audience would see that and almost consider it a pseudo-explanation.

Arthur: That's right. People actually do use those things all the time as pseudo-explanations for memory tests and things like that, but I promise that when I use them, it is really part of my process. You hear ninety-nine percent of what is in my head for those few minutes. It would be a lot harder for me to do it one way whilst verbalising another!

Will: I believe you, thousands wouldn't!

Arthur: Unless they sat down with me and I really went through the steps slowly, piece by piece, to show them it is real. If you watch a video of me doing a show again and again, you could actually check everything I am saying and you would see that it is all true. Because I am a Professor of Mathematics, my reputation and integrity is important to me.

At the same time, I do have this background in magic that has been immensely valuable to me.

Will: So what is your magical background?

Arthur: When I was in high school, I was a children's magician doing shows for the local kid's birthday parties. I did that for a good few years and also studied the classics of card magic and mentalism. I have a great respect for magic and it has helped my life in numerous ways.

Will: Normally, around this time, I would ask "How did you get into magic?" but with you it is more of a two-pronged question – "How did you get into magic?" and "How did you get into maths?"

Arthur: As far as maths is concerned I have loved numbers for as long as I can remember, probably for as long as my mother can remember! They were always a game for me that I enjoyed playing and which I found endlessly fascinating. I loved taking problems apart and trying to do them in more than one way. I find the consistency of mathematics to be immensely beautiful.

As far as magic is concerned, I have always been a show-off. I love the attention! So, like many kids, I got interested in magic and learned to do some tricks but then I stuck with it, went to the magic store and started doing children's shows as The Great Benjamin! Since most kids believe in magic, my goal was not to fool them, but entertain them. I would go to great lengths to make the kids laugh.

Just before I started college, I started to get invitations to ▶



Photo: Arto Airaksinen

perform for older audiences and I turned my attention to mentalism because I loved magic that involved thinking and talking. I read Corinda, Annemann and the *Color Series of Mentalism* and I loved them all. I also read most of Harry Lorayne's card magic books but particularly loved his books on memory techniques. I actually learned the mnemonic code from *The Memory Book* by Harry Lorayne and Jerry Lucas. When I started doing mentalism my father suggested that I included some of my maths in the show. I wasn't really sure it would work or entertain people but, when I tried it, it got the best reaction of the show. After seeing how well it worked, I decided that it would be even better if I did bigger problems or solved them faster. That is when my interests in maths and in magic really came together.

Will: And how did they develop?

Arthur: I went to college at Carnegie Mellon University in Pittsburgh and there was a great group of local magicians, including Paul Gertner. Paul gave me lots of encouragement that helped me stick with it and keep working. The Pittsburgh magicians were also great at introducing me to other people or taking me to conventions. As luck would have it, the annual IBM convention was held in Pittsburgh whilst I was there and they had me perform during the opening-night gala show. At that convention I met James Randi who was really excited about what I did. Randi is famous as a de-bunker of fraudulent paranormal phenomena and he liked me as an example of what people actually can do for real. Randi then introduced me to Scot Morris of *Omni Magazine* and the editor and publisher of *Discover*, which helped get me a certain amount of publicity in print and on television. When I performed at an Abbott's Magic Get Together, Ali Bongo saw me and he brought me to the UK to perform on The Paul Daniels Magic Show in 1985

Will: And you can see that performance if you search for it on YouTube...

Arthur: I was much younger then! I would say my show hasn't actually changed too much though, not least because I have had to concentrate on my academic career, teaching and writing etc.

Will: I am curious about your choice of material, particularly because you perform in such a niche area. How much came from published mathematical magic and how much have you developed yourself?

Arthur: Believe it or not, the calculation stuff, like the squaring of large numbers, is something I developed on my own. That is something that came about organically because of my interest in playing with numbers. On the other hand, for

example, the method I use to calculate the day for any date is something I learned from Corinda. The first magic square routine I performed I learned from Annemann's *Book Without a Name* which was reprinted in the back of a Tannen's magic catalogue in the mid 1970s. Later, in 2004 or 2005, I read a Lorayne article in *Genii* that had an idea for the magic square that I really liked. I adapted that idea to create the magic square that I do today using someone's birthday. I learned the phonetic code from a Harry Lorayne book, as I mentioned before, although I may be the first person to apply it to mental calculations. I have definitely benefited from magic literature although often I have my own twist on things or try to make them more efficient and direct. If you are going to entertain with Mathemagics then it has to be direct, it has to be high-energy and it has to be fast, otherwise your audience will pause and think: "Wait a moment, I am not supposed to like maths!" Then you could lose them.

Will: When you were developing from one magic square to another, was that because you had always wanted the routine to have a particular set of features or was it a more organic thing where you just happened to see a new idea that you liked?

Arthur: I was very happy with the Annemann based routine that I had been doing for twenty-five years because it was very, very interactive. The one thing it didn't have, however, was a personal touch. The new one, that I perform now, is based around someone's birthday so it has much more meaning to that person. Also, there is a surprise ending, where the birthday appears again at the end of the routine. That provides a nice kicker on the routine, to really punctuate it, and you don't often get that with a magic square. The spectator doesn't have as much to do on stage in terms of interaction as in the Annemann



Arthur with Paul and Debbie at The Magic Circle Awards Night



piece, but that is more than compensated for because the square that is created is more meaningful.

The "day for any date" has the same feature. If someone doesn't know what day of the week they were born on and they ask you after the show, you can tell them something very personal about themselves that they did not know beforehand. That is a wonderful gift to be able to give somebody.

Will: I think your act contains about five different routines. Have they always been in the same order or is that something you have played around with?

Arthur: It developed organically. The birthday routine was a piece of filler that eventually became a part of the act. I have to give a lot of credit to The Magic Castle for the act's development. I moved to California in 1989 to teach at Harvey Mudd College, where I still teach today. My school is about fifty miles from Hollywood, and I auditioned to perform at The Magic Castle. Dai Vernon and Ricky Jay were both in the audience and, because what I was doing was so different from other people, I got a standing ovation. My first show at the Castle was in 1990, and I've performed almost every year since then. When you work at The Castle you do three shows a night for seven nights in a row and that really gives you a chance to develop a more natural patter and to find out what kinds of jokes stick.

Will: It is interesting that you mention the performance side of things so much. When I think of stereotypes, a mathematician is an introvert and a performer is an extrovert yet, in your shows, you manage to come across both as an expert mathematician and a great performer.

Arthur: I wear my nerd badge with pride and I'm not acting too much on stage... I really do love numbers that much!



Photos: Mark Hesketh-Jennings

Will: And did you always perform in a high-energy style or did you exaggerate that to involve people more?

Arthur: I think that it was an outgrowth of doing magic for children. I knew that five-year-olds needed high energy and audience participation so I suspect that my style's origins go back to The Great Benjamini!

I think my background in magic taught me more about being a good teacher than anything. You need audience participation, you need high energy, you need humour, and you need climactic moments. When I design a university maths lecture I look for those kinds of moments. I want everyone to leave the class with at least one moment of "Wow that was cool!" If I don't provide that for them then why should they come to class rather than just read the book? It is also really great to be known in the mathematical community as the guy who does magic. It has provided me with many opportunities that I might not otherwise have had.

Will: One of the things I have heard most about you, after the two or three performances I have seen you give, is "I wish he had been teaching maths in my school."

Arthur: Thank you! My goal is to try to bring mathematics to the masses and show that it really can be a lot of fun. Martin Gardner is one of my sources of inspiration in that respect. As a matter of fact, I developed my method for squaring numbers when I was thirteen or fourteen and none of my teachers had seen it before. I thought I was the first one to discover it. Then, a year before I started college, I was reading a Martin Gardner book on recreational mathematics called *Mathematical Carnival* and there was a biography of a lightning calculator named Alexander Aitken who used the same method. It ruined my day but at least I had the pleasure of discovering it for myself when I was younger!

Will: I imagine lots of Members use their magic knowledge in their real jobs too, but I wonder whether your teaching or academic work has influenced your magic?

Arthur: That is a good question. I have the experience of getting up in front of students every day so that, to some extent, gives me lots of performance time. It also makes what I do feel more authentic. When people know that I am a real professor with real credentials they are more willing to listen to my message about the beauty of mathematics. Without those credentials I am not sure I would be in quite the same position to spread that idea.

Will: Right. It gives you a certain status with your audience.

Arthur: Yes. For example, James Randi has done a lot to spread the message about science vs pseudo-science, but sometimes he has been diminished by his critics because he is "just a magician and not a scientist." Now, if Randi happened to have a PhD in physics or the history of science that would make a difference. After he received a MacArthur Fellowship, also known as "the genius grant", his credentials have not been questioned as much.

Over the last five years I have put out some DVD courses produced by a company called The Great Courses on *The Joy of Mathematics*, *Discrete Mathematics* and *The Secrets of Mental Math*. They have been extremely successful, selling hundreds of thousands of copies. I'm sure that my background in magic makes me an entertaining presenter that my audiences enjoy listening to, but I would not have been able to do the courses without the academic credentials. As we speak I am putting together a new DVD course for them on *The Mathematics of Games and Puzzles*. Everything from how to count cards and understand casino games to how to solve a Rubik's Cube or Sudoku puzzle will be covered. That will be recorded in the spring and should come out in

the summer or autumn of 2013.

Will: Who would you say your biggest influences are within the world of magic?

Arthur: The people who influenced me through personal interaction would have to be Paul Gertner and James Randi, both of whom I met at a key stage of my magical development. For the people whose writing has had the most influence, I would have to choose Martin Gardner, Harry Lorayne and Max Maven. A lot of the people at The Magic Castle have also been extremely supportive of me.

Will: And how about biggest influences outside magic?

Arthur: There was a Professor of Psychology at Carnegie Mellon University named William Chase who was an expert in cognitive psychology. He was interested in understanding how I could do the calculations that I did even though I have a rather normal memory. He studied me and, in working with him, I was able to understand my own thought process better and increase the speed and size of the calculations I can do. Most importantly, there is also my wife Deena, who really does influence everything I do!

Will: Thank you very much for taking the time to talk with me. I have found it fascinating and I can't wait to see you lecture at The Magic Circle in the Spring.

Arthur: It will be great to see you, and hopefully some of the people reading this article then! ●

More information on Arthur Benjamin's work can be found on his website www.math.hmc.edu/~benjamin/ and his DVD courses are available from www.thegreatcourses.com