Mathematics and Narrative – A Happening

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First I want to thank the committee for inviting me to tell you about my experience with "Mathematics and Narrative".It taught me a great deal and gave me much pleasure, so – yes! Of course! – I'm grateful for the chance to tell you about it.

In the fall of 1992 Aurora Theatre Company was founded by five members of the Bay Area theatre community of whom I was one. Our stated purpose was to produce theatre which emphasized the playwright and the actors, and to do so in an intimate setting. While we appreciated the physical aspects of production (sets, costumes, lights, etc.) we wanted to do theatre which was supported by those physical aspects, but never dominated by them.

Ira Hauptman, the playwright, wrote me a letter on June 7 2001 in which he asked me if he might send me a play he had written called PARTITION, and he enclosed a very favorable letter from James Lepine who is, as I'm sure you know, prominent in American theatre. He is a writer-director who worked with Stephen Sondheim on SUNDAY IN THE PARK WITH GEORGE, and INTO THE WOODS. This is how Ira described his play:

" It's loosely based on real events and deals with the relationship between two mathematicians in the early 20th Century: Srinivasa Ramanujan and G.H. Hardy. Ramanujan was an Indian mathematical genius without college education whose work came to the attention of Hardy, a Cambridge don. At Hardy's urging, the university brought Ramanujan to England to work with him. After a few mathematically remarkable years, Ramanujan became ill with tuberculosis, and after lengthy medical treatment returned to India ,where he soon died.

The play is about the different cultures that shaped these men, and the mathematics that both drew them together and destroyed them. Other characters are a Hindu goddess who brings Ramanujan equations in his sleep, and Pierre de Fermat, a seventeenth century French mathematician who bequeaths an unsolvable problem."

Given the subject matter (Ira went on to say somewhat dryly), I'm pleased that James Lapine called the play "a very enjoyable read".

It is now time for me to make a disclosure: I am an a-mathematical person. Not only am I untutored and unskilled in that science, I don't even enjoy it , though I know (and this always used to seem strange to me) that other people do. I had no idea that "partition"

was a mathematical term. The only partition I'd ever heard of was a wall separating two spaces.

No, I'm sure that I agreed to read the play because I was both intrigued and bemused at the notion of a play about two famous 20th century mathematicians that included an Indian goddess and an equally well-known (perhaps BETTER known) 17th century French mathematician. Mr. Lapine's approval was also a very positive factor.

About a month later I wrote to Ira and asked him to send the play which he did, promptly.

I began to read PARTITION for the first of many times. On page 5 Fermat says: " Twenty five October, 1634. A new discovery by me , Pierre de Fermat.
If p is a prime number – that is, it can be evenly divided only by itself and 1 – and if n is any whole number, then n-to-the-p minus n is divisible by p. If this proposition fails to dazzle you, dear reader, then you have the capacity for art of a Paris pigeon's splattering rectum."

I laughed out loud, to the surprise of my two office mates and read the rest of the play .

By Dec. 5 I had decided to consider a production of PARTITION, and I contacted Ira to tell him so. At least I thought we should move to the next step. Early in February (it's 2002 now) I received a re-written script , and I put it to a test that has proved useful in the past: I read it aloud to myself. Sometimes, in my experience, a play can be a good silent read, and fail miserably when it's read aloud. This one read beautifully. The characters and the situations were, as they say, compelling.

I was more certain than ever about the viability of Ira's play, but there were other matters to consider. Could Ira Hauptman and the Aurora work together? Could I cast the play? Where was I going to find two East Indian actors? Most important of all, could we raise the money to do the development work that needed to be done for the script? At the least we needed a one-week workshop and a staged reading before an audience. I knew that because of the disappointing results from other original plays that we'd produced without a good development process.

First we had an informal reading at my house. A colleague at the Aurora reminded me of a young East Indian actor that she had used in an earlier reading. His name was Rahul Gupta. He read Ramanujan very well, and he was part of the project from that moment on. Second I contacted a couple who were in the process of setting up a family foundation for the development of new plays. They heard the reading, and they were with the project from then on. All this happened toward the end of March. I knew by then that I had a visceral belief in the play, and that some others shared my conviction.

Early in April Ira agreed to let us do the premiere. By April 13 it was definite that PARTITION would be the penultimate production of our 2002-03 Season.

We found the funding for the workshop including the money to fly Ira out. I was clear about the casting for everyone except Namagiri. Ira suggested a young Indian, actor from LA who had done a reading of the play down there She agreed to come up for the workshop, so that problem was solved for the short run at least.The staged reading was done on August 10th. There were a few aspects of the script that we wanted to discuss with Ira, but overall we felt both hopeful and enthusiastic.

On Aug.15th I sent Ira a long letter asking him if he'd be willing to make one or two major structural changes in the play. The changes had mainly to do with the sequence of events. I felt that some of the scenes, as written, confused the narrative. A month later he answered me this way: "-----After two years and five drafts, the script's flaws are as much a part of it as its virtues. Every time I try to correct a problem, it causes worse problems.' I swallowed hard and said – to myself, and to Ira – "OK." I do want to go on record right now as saying that I think he was right. Ultimately, while we were in rehearsal for the production, Ira and I agreed on a portion of one of the changes I'd wanted to make, and that worked . The rest were best ignored, as it turned out. In retrospect I think that is because the changes I asked for would have made the overall structure completely linear, but the story that Ira wanted to tell wasn't best served by a linear structure. Any time you're dealing with a materialized Indian goddess and a French mathematician who has been dead for several hundred years "linear' is not necessarily a good choice.

Meantime we were in contact with several people from MSRI through the good graces of some of our Board members. Bob Osserman was one of those people. We had a great time (at least I did) talking about PARTITION. "Imagine that" I thought in my ignorance. "Mathematicians enjoy talking about the same things that ordinary people do." Of course, we had a project in common. We all wanted PARTITION to inform and amuse, and move as large an audience as possible. In fact, during the run of PARTITION at the Aurora MSRI sponsored a panel discussion about the play on the Cal Campus. At the same event three of the actors did selected readings from the play. We were very grateful because there was a large audience for the event full of people with a particular and informed interest in the subject matter of the play. I expect any number of those people might not have known about the production if it hadn't been for the MSRI event.

The Magic Theatre in San Francisco which had built its reputation on doing new plays was, with the help of the Sloan Foundation, mounting a series of readings of science plays at the Exploratorium in Sept. of 2002, and PARTITION was one of their choices. For those of you who may not have been to San Francisco I should explain that the Exploratorium defines itself as The Museum of Science, Art, and Human Perception. The reading was very successful. In fact, PARTITION drew the largest audience of any of the readings in that particular series. All very encouraging.

Now, however, it was time to get serious about the details of producing this play.

Casting: I had commitments from very good local actors for Ramanujan, for Fermat and the Policeman, and for Billington. The actors I wanted for Hardy and Namagiri couldn't

commit until after Jan. 1st because of pilot season – a period of time during the early winter when most of the TV series do their casting for the following season. Rather quickly the actor I'd chosen for Hardy said he'd do the play, but we lost our first Hindu goddess to a successful pilot season. We would lose another one before the role was finally cast. Sometime in January I was introduced to a much younger Indian actor who, spoke very American English (she was from Chicago), and who was very down to earth. There was absolutely nothing mysterious or "other worldly" about her. However it occurred to me that Namagiri in the script is very practical,too. She worries about Ramanujan's diet, whether or not there will be a ticket for him on the boat from Madras and how he'll manage to stay warm in England. I cast her.

We were about five weeks from the first rehearsal.

Production elements: The Aurora is a thrust stage, surrounded on three sides by audience, and it only seats 150 persons. There are 4 major ways to enter or exit the space: upstage left and right and downstage left and right.
In this restricted space we now proposed to produce a play with 21 scenes in the first act and 14 in the second. There were a total of 7 or 8 different locales that we would need to represent. By page six of the script we somehow needed to move into and out of four of them – quickly!

Fluidity was all!

Nothing could be in the playing space, or on an actor that hadn't earned the right to be there.

Our goal was to immerse the audience in the characters and the story and the ideas of the play. We wanted all the production elements to help us toward the goal. We all agreed. Anything that got in way would be thrown out.

I had long talks with the designers. Sound was going to be very important. For example, we couldn't possibly bring on a set or even set pieces for a scene in the hospital lavatory, but we could easily manage the sound of a dripping faucet. We needed Indian clothes for Ramanujan in the early scenes, but that turned out to be one of the least of the problems because I still had a dhoti and shirt that had belonged to my father. They were ancient, but in decent condition, and they fit Rahul! The set designer was very taken with the notion of painting the stage floor to look like the floor of the library at Trinity College, Cambridge, but he wanted to (as they say) "tweak" it slightly to make it look as if Escher had had some influence on the design. I was concerned about that. I thought some people in the audience might get more involved with the floor than the play. And how were we going to represent the bust of Isaac Newton? Suppose we couldn't find a bust? We considered using a "gobo" the projection of a shadow.

The answer to all those questions was " The simpler the better." We would have four playing areas: one upstage on an elevated level for Fermat, one upstage on ground level

in front of a set of imposing doors which would be presided over by a bust of Sir Isaac in a niche (our prop person actually found a way to sculpt a pretty good one), one downstage which would always be Ramanujan's bedroom, and in the center of the stage floor we would stage those scenes that needed no furniture – or at least nothing that an actor couldn't carry on and off by himself. The downstage right entrance was at the top of a slight rise reached by three or four wide, shallow steps. That would be Namagiri's place, and no one but she would use it.
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So there we were; Fermat had his elevated status in the after-life, Namagiri had her special goddess-like area (though she did come into scenes with other actors as well), and Hardy and Billington had a bit of a combination room at Trinity College, complete with
a slightly Escher-esque floor, and Ramanujan had his tiny room with a bed and a stove and a suitcase.

We would use lights to define these areas and sound (where necessary) to help identify them.

With that much technical support I felt we could tell the story well.

On the 18th of March we had our first rehearsal.

 It would be nice to be able to say that I went into rehearsals certain of everything I wanted from the play, knowing exactly which moments were most important, and exactly how I hoped to realize each scene, but that would be a lie. Even if I had convinced myself that I was in control of all that I'd have been deluding myself. Rehearsing a play is a group effort, and that's exactly why casting is so important, In my opinion it's the most important set of choices that a director makes. The play – however good it may be – is incomplete until it's embodied. So we began to put PARTITION on its feet.

In the blackout before the play began the audience heard the sound of screeching train brakes. (#2 – railway station) When the lights come up Ramanujan is center stage being questioned by
a London policeman while a very anxious and annoyed GH Hardy stands by.
It's 1918, and Ramanujan has just attempted suicide by jumping on to the tracks of the London Underground in front of an approaching train. Fortunately, a guard saw him and threw a switch. Ramanujan says he attempted suicide because he believed he had caused an air raid. Hardy manages to disentangle Ramanujan from the law. Ramanujan feels guilty and grateful. Hardy says: "Let's not get mawkish. It's the least I owe mathematics."

What a curious, stimulating, fascinating presence GH Hardy must have been. By this time Most of the cast had read THE MAN WHO KNEW INFINITY as well as Hardy's APOLOGY. We all knew that he avoided mirrors, and that he would never, if he could

avoid doing so, touch another human being..

 On page four of the script he addresses The London Mathematical Society in 1913:

 "My topic, perhaps slightly shocking, is that applied mathematics is not real
 mathematics. You heard me correctly " (Was that second sentence occasioned by the
 beginning of a buzz of outrage from the audience? It seemed plausible.)Applied
mathematics – such as the calculations that allow one to build bridges – is not real
mathematics because it is ugly. . Only pure mathematics matters, because its utter
uselessness allows it to be beautiful."

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So we arranged a sound effect at the appropriate moment to indicate the outrage of those
who disagreed. It also seemed clear that Hardy would have enjoyed stating
 his case with elegance and wit and at the expense of all the members of the London
Mathematical Society who happened to be involved with Applied Mathematics. When
The speech was read that way the character of Hardy began to come alive.

The final line in the speech and the scene is: "Oscar Wilde believed in art for art's sake. I
believe in mathematics for art's sake, as does every real mathematician." Some applause
on the sound track, but mostly outrage from the LMS audience of 1913. .

Then the lights went down on Hardy, and up on the inner above, and there was Pierre
Fermat , (#4 – Fermat) for the first time in the play ,speaking the pigeon speech I read to
you a few moments ago.

You see what I mean about a non-linear time span? We have gone, in the space of five
pages, from 1918 to 1913 to 1634. However we've also been introduced in an efficient
and economical way, to Ramanujan, and Hardy and to Fermat whose best known
equation would play a large part in Ramanujan's future – at least as the story is told in
this play.

Returning to Hardy's 1913 speech which we just heard, and his statement that "Only pure
mathematics matters because its utter uselessness allows it to be beautiful" – that's not a
point of view that many non-mathematicians will understand or appreciate, yet it's
important for ALL the audience, finally, to see Hardy as a sympathetic character. To that
end I think it was inspired of the playwright to invent a character named Billington – a
Classics Professor at Trinity College, and a good friend of Hardy's. He's a perfect foil for
both Hardy and Ramanujan because he's no more interested in mathematics than they are
in the classics. However Billington is much more interested in people, and that gives him
an edge which will be useful to the play.
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(Billington-Hardy scene, pp.5-7)

B: I told my colleagues you didn't mean it, Harold.

H: The Cambridge scholars of Greek and Latin heard about it? Excellent.

B: They were appalled. Telling the world Aeschylus will disappear inton dust, but prime numbers will live forever. Dear boy!

H: Absolutely. Indivisible numbers will inherit the earth They're as beautiful as swans, and as numerous as ants. Aeschylus, meanwhile,left seven plays more primitive than cockroaches.

B: It's dangerous for me to be seen with you at Cambridge.

H: Would it help if I bypassed the classics? If I said that mathematics will last longer than Shakespeare?

B: Of course mathematics will outlast Shakespeare. The vernavular is a passing fad.

H: Peace, then.

B: Not so fast. The chicken is drhy again.

H: I forgot to complain last week.

B: Was there something on your mind more important than the wretched food at high table? Damn it, man. We're not talking about dead Greeks now. We're talking about this college's inedible weekly chicken.

H: Well, it won't bother him. He's a vegetarian.

B: Who?

H: The someone on my mind all week.

B: Why is a vegetarian on your mind, Harold?

H: He's a simple clerk in Madras—s. Ramanujan. Twenty-six years old. Thrown out of college. He sent me four books of equations. They left me speechless.

B: Keep speaking.

H: Hundreds of pages in a strange green ink. Formulae on hypergeometric series, continued fractions, singular moduli, elliptic functions….

B: Enough. Perhaps he copied them….

H: They employ a very peculiar,personal system of notation.

B: Are they correct?

H: He supplies no proofs. Some of them I've verified, but some are beyond my power to evaluate.

B: Beyond YOUR power?

H: I've been puzzling over them all week. Hence my neglect to write a letter about the chicken.

B: The life of the mind is an unimpressive excuse, Harold.

H: Alfred, Alfred. I wish you could grasp the strangeness of his work. He says he can give meaning to negative values of the gamma function. He says he's found a function that gives the exact numbe of primes less than a given number.

B: Yes?

H: Those are impossibilities. His ignlorance is as great as his knowledge.

B: So your field has been invaded by a rude, untutored barbarian wildly swinging his ax. How thrilling. How unpleasant. I wish I could advise you, but wild men have never been attracted to the classics.

H: Nietzsche was attracted to the classics.

B: We shipped him to modern philosophy, where he couldn't damage anything important.

H: Alfred, I want to bring Ramanujan here . To Cambridge.

B: Is that wise?

H: It's essential.

B: And do you think he'll come?

H: What would stop him/

Now the play goes to India, to Namagiri's shrine (#6 Ramanujan praying) where
          Ramanujan has gone to pray for
her help. "I beg of you. Suspend the sacred law that a Brahmin may not travel overseas.
Allow me to leave India and go to the English mathematician to complete my learning."

Namagiri does, indeed, appear to him. "I do not change laws" she says. "I allow people to disobey them without torment when I pity them. You are a mathematician, and you Have my pity."She also announces that she's going to England with him. " My priests can manage here. You cannot manage there."

It's good narrative structure, it seems to me. Within a dozen pages we've been introduced to the five major strands of the narrative. Now they begin to be braided together.

As Hardy exits after his somewhat stiff first meeting with Ramanujan in England, Ramanujan turns to Namagiri and says "I want to go home!" Namagiri points to Hardy and says, "Follow him!'

How could there be two human beings more different, one from the other? They share one thing (aside from their common humanity which Hardy, of course, would rather not think about), and that's a passion for "pure mathematics". The non-mathematical part of our audience (people like me) must find their way into the play by understanding that a passion for mathematics is as consuming and as motivating as any other passion whether it is for another art, or a cause, or (indeed) an idol – human or otherwise.

Not too long after Ramanujan's arrival at Cambridge, Billington is giving him a tour of Trinity College. He's concerned about how Ramanujan is adapting to this very different place.Ramanujan says: "Billington, do not feel sympathy for me." Billington responds with: "It isn't pleasant to be alone."
R: Do you know the result of multiplying zero by infinity?"

B: I believe there is no result.

R: Zero is absolute reality. Infinity in the endless manifestations of that reality. When you multiply them, you produce not one number, but all numbers, each of which corresponds to an individual act of creation.

B: Well!

R: So how can you think I am ever alone, when I am surrounded by numbers?

B: Have you told that to Harold?

R:No. He is an atheist.

B: It will help him to know you.

R: I have told it to you.

B: Me? (pause) Thank you.

Still the differences between Hardy's approach to mathematics and Ramanujan's are significant. That becomes apparent very quickly. In fact it's a major part of the play. Here's a portion of another scene in which Hardy and Ramanujan explore their differences.(# 9 – Hardy and Ramanujan)

H: I was in a cab today. It's number was 153. Can you tell me anything interesting about it?

R: It is the sum of the cubes of its digits. One cubed plus five cubed plus three cubed equals 153.

H: That's right. I happened to see it in a book of arithmetical trivia. How do you know it?

R: I am familiar with many positive integers.

H: There are only five such numbers possible.

R: I know there are five.

H: There are only five possible.

R: There happen to be five.

H: There don't "happen to be". There can't be any more.

R: How do you know?

H: It can be proved.

R: How?

H: Easily

R: I am sorry.

H: There is nothing to be sorry about. You are here to learn.

R: I seem to be imposing on you.

H: Don't be absurd. Log log n is beautiful. I'll prove it if I can. But only you could have come up with it.

R: Then what mustyou do?

H: Ramanujan, listen. Ideas are made out of other ideas. They are derived.

R: They are derived?

H: Mathematical ideas are true because other mathematical ideas are true.

R: They are true because they are true. You discover them.

H: You deduce them. You prove them. Mathematics isn't religion.

R: Is that true?

H: Yes.

R: Then from what did you deduce it?

H: You can't wriggle out of this, Ramanujan. This is European mathematics. What you came here to learn.

R: This was not in Carr's book.

H: Carr presented results. He didn't show the process. He was preparing students for examinations.

R: Oh. Then Carr…. was not a mathematician.

H: For our purposes, no.

R: Then what I am doing is not—

H: Yes it is! It's superb mathematics. It only needs…rigor.

R: Do you mean that?

H: Long log n is Hobbs class.

R: Hobbs---? Oh, yes. The cricket player. Forgive me, my mind is whirling.

H: Shall we get to work?

R: If you think I can be of—

H: Yes you can.

R: I never knew mathematics is supposed to be….difficult.

Now Ramanujan must try to understand the concept of proof, and (as his friend and mentor, Hardy says) the necessity of proof. He turns, of course, to Namagiri. (#13 – Namagiri cooking) But she can't help him. "How could you bring me incorrect theorems?" he asks her. "How can I tell?" she answers. Ramanujan says, "You have never told me your sources." Namagiri says "I dream as well as you."

For years Ramanujan believed that Namagiri wrote equations on his tongue while he slept. (#8 –Namagiri about to write). His theorems were – quite literally – inspired. He says to Namagiri "I would feel much better if you could explain proof to me either when I am asleep or awake." There is a pause and then Namagiri answers: "I may not have as much time to be with you as I like." Now we know that the bond between Ramanujan and Namagiri is beginning to fray. The more consuming his work with Hardy becomes the less he can depend on Namagiri. There are other problems,too.Hardy was, of course, a committed pacifist, and he suffered insult and the loss of some colleagues during the First World War because of that commitment. Meanwhile Ramanujan sends him (as Hardy says)" reams of proofless theorems. If I allow him he'll consume me." "Ah!" says Billington . "The truth! He needs you. How offensive of him."
So the bond between Hardy and Ramanujan is strained, and Billington and Hardy are getting testy with each other, too.

I want to pause here to say that I think Ira's choice to write Namagiri as a character in this play was correct dramaturgically and very satisfying theatrically.(#7 – Ramanujan and Namagiri) Plays aren't novels (to state the obvious); plays are about ideas embodied in stories that are described and explained in words and actions. They are shown to us. What better way could there be to show us the contrast between the world into which Ramanujan was born, and the world to which he traveled than to incarnate Namagiri, as it were. She's still a goddess, but she's very human, too, and for most of the play Ramanujan is perfectly comfortable with that.

It's when he must begin to try to meet Hardy's standards that the difficulties begin. His world has indeed turned upside down. When Hardy says that the mathematics Ramanujan is doing is superb – that it only needs…rigor"He's right, of course,and he's sincere, but in some sense what he's also saying is "be like me!". Part of what Hardy   means by "be like me" is "don't depend on other people for any emotional sustenance; most especially, don't depend on ME for that!" His world , from what I've read, revolved around mathematics and cricket – in that order. Ramanujan's world in 1918 revolved around mathematics only. He was half way around the world away from his home and his family. All his life, until he came to England, he was cared for by a houseful of devoted women. Now he was absolutely alone. His religion and his taste demanded that he eat a vegetarian diet. You can imagine how easy that was in England in the winter at the end of a war. Hardy either couldn't or wouldn't (possibly a little of each) spend much time with him In one particularly painful scene toward the end of the first act Hardy , who at least pays Ramanujan the compliment of assuming that because he is a brilliant

mathematician he can't possibly be religious , says: " You are an observant Hindu, Ramanujan. Do you think your religion is true, or do you observe out of habit? No particular gods you believe in?" And Ramanujan, who is acutely uncomfortable – which Billington can see, though Hardy can't – answers: " No. I observe…out of habit only."

Back in his room Namagiri tells him that she must return to Madras. She says she'll still visit him in his dreams. Ramanujan is sure that she's leaving because of his conversation with Hardy. She worries more about his waking hours. She says;" Show me where I put your slippers." Ramanujan answers: " I know where they are."

Namagiri; Show me your slippers!

Ramanujan: There is a war going on!

The stage direction says "Namagiri exits. Ramanujan walks around his room as if for the first time.

That's a spare and eloquent exchange – good theatre, and good story-telling.

Soon after Ramanujan attempts suicide. Now even Hardy knows that he must do something. He takes Ramanujan a book on Fermat's Last Theorem and invites him to prove it. He says, "A proof would bring ultimate honor to you." "And to her", says Ramanujan, and he adds:"And this will also make amends for what I have put you through?"

Hardy: Seeing it encased here at Cambridge? I should think so. (#12 Hardy and Ramanujan in Ramanujan's room.)

The stage directions say that, as Ramanujan begins to read the book and Hardy leaves, we hear malicious laughter from Fermat.

Ramanujan's pursuit of the proof for Fermat's Last Theorem has become obsessive. He prays to Namagiri, and she does return in his dreams. She can't find anything to help him with the theorem and she's also concerned about his health. In one of the strangest scenes in the play she actually meets with Fermat and pleads with him to help her. Fermat is an outrageous flirt, but she tells him that she doesn't find foreign mathematicians attractive. Finally Fermat has to admit that he can't help her because he can't remember his original proof. "You cannot repeat the process?" says Namagiri. And Fermat answers: "When the fire dies, ma cheri, what is left but ashes?"

When Namagiri tries to go back to Ramanujan she can't reach him. Finally he opens his mouth as if to receive another equation from her, and she screams. His mouth is full of blood.

Ramanujan is taken to hospital and Billington and Hardy have a furious argument. The truth is that they share responsibility for this episode because they both thought they

knew what was best for their Indian colleague, but it never occurred to either of them to ask HIM.

They agree that he must stop working and Hardy goes to see him to persude him of that. He finds Ramanujan in the hospital lavatory, sitting on the floor – working! What else? Hardy says: "Why are you in here?"
"I am sick." Answers Ramanujan.
"I know why you're in hospital. Why are you in the hospital lavatory?"
 Ramanujan answers: "It's the best place to work. The rooms are chilly, drafty."

There is a terse conversation during which Hardy says, "You must stop working; I won't let you work." And Ramanujan says 'You can't stop me, and besides I've found something that will intrigue you so much that you won't WANT me to stop."

The climax of the scene is in the following exchange:

R: Hardy, can you really not see this from my point of view? You brought me here. I am trying to repay your faith and kindness.

H: You've done that.

R: Europeans do not understand how to accept graciously. In Madras I once made potato soup for two English women.When I offered them a second portion they accepted. When I offered them a third they declined.

H: They were no longer hungry.

R: That is irrelevant!

H; Or they were dieting…or they didn't want to seem piggish.

R: There is no excuse for rudeness. I was ashamed, humiliated. I left Madras for a week.

H: They did not mean to hurt you.

R: But they did. When I offer you something you must not turn it down.

H: What have I gotten into? 'East is east, and west is west, and never the twain shall----'

R: That is not what this is. I had to read Kipling in school. He is an idiot.

H: Apparently not all the time.

R: This is not about the "east". When I was a child and did not get yogurt and raisins, I rolled in the mud. When I played goats and tigers with my mother my pieces were always the tigers. Are there not western children like that, too – demanding, stubborn, proud?

H: Ramanujan-----

R: There is nothing wrong with the East. There is nothing wrong with India!

(Ramanujan has worked himself into a coughing fit. Hardy doesn't know what to do, and, as usual , is reluctant to touch him.)

H: So my mission is hopeless.

R: No, it is not.

H: You're telling me you want to die. It's your third offering of soup, and I have to accept it.

R: No. I am telling you that Poincare's theory of modular forms can be applied to Fermat's Last Theorem with surprising results.

H: And if I ignore you?

R: I will still work as long as I am able. You of all people should know that you cannot "save" me from mathematics.

H: All that's possible now is the glory.

Hardy understands, but this time it's Billington who insists that he knows better. Ramanujan must return to India. Hardy is sure that will kill him. Namagiri is sure that he will die unless he gives up his work on Fermat's Last Theorem.. She even brings Fermat to him in a dream to persuade him that searching for the proof is a hopeless endeavor. (#10 – Namagiri and Ramanujan with Fermat) Fermat says: "---You will have a chapter in any eventual proof, so why not step aside and let the next mathematician die early?" Ramanujan says: " M. Fermat, would you like to work with me?"

F: It is impossible for a dead man.

R: Ah, but you wish you could. I saw the spark in your eyes."

F: Perhaps.

R: Then do not tell me to give up.

Namagiri is furious. She retrieves some orange paint – the exact color of her own skin, and paints Fermat's face. 'You are Ramanujan's god", she says, "so you should look like a god'

Ramanujan is crushed. Namagiri says 'You will never again taste me in your theorems."
(#11 – Namagiri dismises Ramanujan)

Shortly before Ramanujan leaves England Hardy goes to see him. It's an awkward meeting. Finally Ramanujan asks: " What is the matter, Hardy? What is disturbing you?"

H: Was I…wrong to tell you about Fermat's last theorem?

R: Hardy, when I return to India I shall never be asked to a funeral.

H: Pardon?

R: I am tainted for traveling over seas. I am excluded from my caste.

H: Good God!

R: And I clearly do not belong in England. My only home is mathematics, the home you have given me. And Fermat's theorem is the grandest room in my home.

 Ramanujan says "Goodbye, Harold" , and in the instant while Hardy is still absorbing the fact that Ramanujan has used his Christian name, Ramanujan seizes Hardy's hand and shakes it. "Goodbye Harold! Whatever happens do not be sorry. (#3 – Ramanujan and Hardy shake hands).

Hardy and Billington find it difficult to reconcile, even after they receive news of Ramanujan's death. Billington says censoriously:" He died believing he was not a mathematician." Eventually they do become friends again with the help (this is a nice touch) of Namagiri who visits Billington in a dream.(#15 – Namagiri appears to BIllington)

. At the end of the play Hardy does manage to look at himself in a mirror. The playwright has Namagiri in the scene (though she's invisible to Hardy, of course) and she gives him the same sign that she gave to Ramanujan which allowed him to leave India.. "Perhaps" he says " I've overestimated…the danger…of being known."

I believe this play – this narrative in action - works because the audience spends close to two hours with brilliant, interesting, flawed human beings, plus one goddess and one ghost. All the characters are passionate about and committed to their pursuits. They make us laugh and they move us . At the end all of them – goddess and ghost included – I will speak for myself - bring me "wisdom from afar" as someone has said that all good stories do, and I am wiser than I once was.

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