

Notes from "The Mathematicians Lament" by Paul Lockhart

(My thoughts throughout these notes are italicized)

Reviews

"It is, quite frankly, one of the best critiques of current K-12 mathematics education I have ever seen."

- The book opens with a "forward" by Keith Devlin from Stanford University

Part I: Lamentation

- Starts with a music analogy
- "Nothing looks better than Advanced Paint by numbers on a high school transcript"...*joke?*
- Lockhart uses painter and musician analogies to compare the way we learn mathematics. All drills and boring lessons, no blank canvases

Mathematics and Culture

- Our culture does not view math as an art
- Lockhart says mathematics is the purest art, but the most misunderstood
- "Our patterns are made with ideas"
- Major mathematics theme: things are what you want them to be, but the choices you make lead to permanent results that you must discover
- Math has been transformed from adventure and imagination to facts and procedures
 - *The facts and procedures are what some people enjoy about mathematics*
- Denying children the opportunity to engage, create problems, solve problems, etc, means we are denying them mathematics itself
- Students learn math from their teachers, teachers learn from their teachers, it is a never ending cycle
- "Many graduate students have come to grief when they discover after a decade of being told they were 'good at math', that in fact they have no real mathematical talent and are just very good at following directions. Math is not about following directions, it's about making new directions".
 - *This particular quote struck a nerve with me, because I too find myself occasionally having this internal struggle of "Am I really good at math? This isn't the type of math I'm good at."*

Mathematics in School

- *Lockhart keeps referring to teachers and educators as different things...what is the difference?*
- Key issues according to Lockhart:
 - Math reform
 - Math doesn't need relevance, its already interesting (*NOT TO SOME STUDENTS*)
 - The problems we do are exercises, not real problems that are good for our brain

- Excellent point made by Lockhart: Why do we let people who don't have a passion for math teach the subject? Not the case for art or music in most schools.
- "If teachers themselves are passive recipients of information and not creators of new ideas, what hope is there for their students?"
- "We learn things that are of interest to us now, not because they might be useful later. But this is exactly what we are asking children to do with math."
- "You learn things by doing them, you remember what matters to you".
 - *The last statement is sort of contradictory to his previous opinion about mathematical relevance when talking about the math reform in schools.*
 - *I agree with his thoughts, but what is his solution? If standardized tests are holding us back, what is his idea for universal assessments?*

The Mathematics Curriculum

- It is easier to test someone's knowledge than to inspire them to create something of their own
- Curriculum is a sequence of notations and not some much ideas and topics
- Salviati says "teaching is not a method".
 - *I only partially agree with this statement. Every teacher has their own way of teaching, and while it is not a "method", they do what best works for them, so in some cases, teaching can be considered a method.*

High School Geometry: Instrument of the Devil

- There is a place for formal proof in mathematics, but it is not in a students' first introduction to mathematical argument
 - *This thought aligns with the main argument of the book. Teachers are drilling facts and procedures, not focusing on why things are true. So to jump into arguments with the students having little background knowledge is unfair to their possibility of success.*
- "Not only do students not have any idea what the teacher is saying, they don't know what they themselves are saying".
 - *I agree!*

Part II: Exultation

- "School has never been about thinking and creating, school is about training children so they can be sorted. It's not surprising that math is ruined in school, everything is ruined in school!"
 - *This statement is not at all inspiring for any teachers or future teachers who read this book. It is not even encouraging to students.*
- Lockhart discusses his passions about mathematics
- Compares even and odd numbers to males and females in a creepy way
- Makes a connection between adding odd numbers and creating perfect squares

- Goal of all mathematicians: to explain in the simplest, most elegant, and logically satisfying way possible
- “Proof is our way of capturing an infinite amount of information in a finite way.”
- Main idea Lockhart wants to get to his readers: just play!