one of the important things to do is make the key move or sort of the key step that you have to do provably unique

而你需要做的很重要的一点是，「让谜题的关键步骤可被证明是独一无二的」

if we go back to that um chess puzzle by Sam Lloyd,

让我们回到Sam Lloyd那个国际象棋谜题

king e2 is the only way to achieve that mate in three

其中王e2是实现三步内将杀的唯一途径（即王往左上方走一格）

and the fact that that's true kind of forces the puzzle uh the puzzle forces the solver to uncover the planned eureka moment that has been set up um

而这一事实，意味着这个谜题迫使解谜者去发现这一设定好的尤里卡时刻

and in chess you know sometimes there's different responses

在实际下棋中，你知道对手可能会有不同的反应

like if the player goes king e2 uh the opponent playing black does not have to respond by queening the pawn

比如说，如果白方王e2，那黑方不一定就会把兵升变为后

the player the opponent can respond by just moving a bishop or doing something else right

对方可以通过移动象或其他事情来回击，是吧？

and in all of those cases the player does have mate in three

在所有这种情况下，肯定都可以三步内将杀对面

but the most interesting part of the puzzle is sort of what do you do against the most challenging response

但谜题最有趣的部分应该是你如何去应对最有挑战性的回击

and so, the fact that there's one key move on the first move is essential in all chess puzzles

因此，第一步棋是关键步对所有国际象棋谜题来说都是必不可少的

it's sort of a requirement of the genre there needs to be a single unique key move on turn one

第一步棋有一个独特的关键走法，算是这种类型谜题的要求

but then often in subsequent turns it can sort of fork and branch a little bit more depending on what the opponent does

但在随后的汇合中，就会根据对方的行动而出现分支

and it's not you know you need to kind of find a response to everything right

对每一种对手的行动你都需要找到一种回应方式

so, the fact that the later part of the puzzle may not be unique because of what the opponent can do

所以，尽管谜题后半部分可能因为对手的下法，并不是独一无二的

doesn't spoil the aesthetics of the puzzle having a unique key move

但这并不影响谜题拥有独一无二的关键一步的美感

puzzles that lack a unique key move are often called “cooked puzzles” meaning you know as in “his goose is cooked”

缺乏独一无二的关键步骤的谜题通常被称为”cooked puzzle”，来自”his goose is cooked”中的”cooked”

（译者注：”one’s goose is cooked”这个俚语大概的意思是说 某人因为做了什么事情，一定会失败，没有一点希望。所以”cooked puzzle”大意是这个谜题肯定成功不了，肯定不好玩）

it's just like not a good puzzle or it's not worthy of being printed

这就意味着它不是一道好谜题，或者说它不值得印刷出来

a second solution is often called a “dual”

（谜题的）第二种解法通常被称为“Dual”

or in video games I’ve heard it called an “exploit”

或者在电子游戏中我听说这被叫做“exploit”（秘技/卡bug）

where the player can get around the intended thing that the developer was trying to force them to do but the player is somehow able to find an exploit to avoid doing this

也就是玩家通过找到了某种方式或漏洞，绕过了开发者试图强迫他们做的事情

and if the purpose of your puzzle is to conceal a unique eureka moment,

如果你的谜题的目的是为了隐藏一个独特的尤里卡时刻

then intentionally having multiple solutions is not a good idea

那么故意提供多种解法就不是一个好主意

and accidentally having multiple solutions may be a problem that you know you want your QA to catch

而意外地拥有多种解法，可能就是你希望你的测试人员能够发现的问题

if you're doing puzzle design you want to make sure that your test solvers are really good at finding those multiple solutions

如果你在做谜题设计，你要确保你的测试人员擅长找到那些多重解法

and the way you want them to do that is by being deductive solvers that can really try and establish the uniqueness of every solution by proving it

你想让他们做到，成为推理型的解题者，能够真正通过证明的方式来确定每个解的唯一性

um and that's hard for some types of puzzles especially uh very stateful puzzles like block pushing puzzles

而这对于某些类型的谜题来说是很难的，尤其是像推箱子这种状态很多的谜题

where there's a million different states that the puzzle can be in and it's often very hard to determine that an alternative way of solving the puzzle is impossible

那里面有无数种不同的状态，通常很难确定出现另一种解法是不是不可能的

you really want to as a puzzle designer make sure you're slicing off those Rabbit Trails

作为一个谜题设计者，你得确保你把那些Rabbit Trails给去除掉

and just making it so that you don't have to check too deep in order to make sure that something doesn't happen

这样你就不必为了确保某些事情不发生而检查得太深

I can give you a million examples of these which I didn't include in the talk

我可以给你举出无数个例子，我之前没把这个包含在演讲里

I think the one that sticks with me the most is in steven's sausage roll they have this level called the tower

我想最让我印象深刻的例子是在《史蒂芬香肠卷》中，有个叫“The Tower”的关卡

where there's eight sausages stacked up and you have to sort of set them up in this unique way

那里面有八个香肠堆在一起，而你得以一种特别的方式把它们摆好

um but the way I solved that puzzle was not the intended way

但我解决这个谜题的方式并不是开发者设计的方式

and the way a number of people solved it I’ve checked on YouTube and twitch videos was really not the intended way

我看油管和Twitch上很多人也不是用的开发者设计的方式

um I mean they ultimately got to the same final state but the sort of setup or the way they went about going about the setup to get there uh can vary in a lot of ways

他们最终是到达了相同的最终状态，但他们达成的方式却是不尽相同的

and some of the setups are really convoluted like the thing that I did was kind of really complex and annoying and difficult to set up and painful

有些方法真的很复杂，就像我的方法，真的很复杂凡人，而且很难做到、很痛苦

whereas there was a nice intended solution to the puzzle but I never even saw it during my first playthrough

而它本身开发者设计的是一个很好的解法，但在我玩的一周目中我甚至没见到过这种解法

I basically had to cheat and look up the answer before I learned what the intended solution was

我恐怕得通过作弊或者查找答案才能知道预定的解法是什么

and I think my experience playing that game would have been a lot better if I had been coerced toward the intended solution more strongly

我想，如果我被更有力地迫使去寻找预定解法的话，我玩这个游戏的体验会好很多

anyways like deductive puzzles kind of need to have unique solutions

总之，逻辑推理型的谜题还是需要有独一无二的解法的

because the flow demands that you sort of prove every step you're not guessing right

因为解谜的流程就要求你去证明每一步，毕竟你不是在猜测，是吧？

so you need to be able to prove every step that you move forward on and therefore you have to just end up with one solution at the end

所以你每前进一步都需要做出证明，因此必须在最后只得到一个解法

you wouldn't be able to have deductive flow if the solution wasn't unique

如果解法不唯一的话，你就不可能有一个演绎推理的思维流

um so many types of puzzles chess puzzles logic puzzles etc. demand solutions

所以，许多类型的谜题，如象棋棋谜，逻辑谜题等，都需要（独一无二的）解法

but many other types of puzzles ought to have unique solutions

但是许多其他类型的谜题也应该有唯一的解法

because of the aesthetics and because of the need to have a unique eureka moment and to force that on the player

因为需要一个独特的尤里卡时刻并将其带给玩家

unique solutions are just a way to facilitate that

唯一的解法正是促进这一目标的一种方式

so, I advocate uniqueness whenever somebody asks me

所以，每当有人问我，我都主张解法要有唯一性

you know and for those point-and-click adventure games that have multiple solutions to some puzzles

你知道，对于那些其中谜题有多种解法的点击冒险游戏来说

that can be okay like

（有多种解法）可能问题不大

there are there are many downsides right like you're doing extra work that the player might not even see

但也有很多坏处，比如你是在做一些玩家可能根本看不到的无用功

um sometimes you'll end up with an extra item and not even know what it was for

有时你在游戏中会得到一个额外的物品，但你甚至不知道它是用来做什么的

um you know like oh that was for the second possible solution to that puzzle and you never used it

你知道，那是给那个谜题的第二种解法用的，但你从来没有用过它

like you want to have this feeling of every item in the game having had a purpose right

你会想有这样的感觉，游戏中的每件物品都应该有一个用途，对吗？

like I got that thing what was it for um

就比如我得到了那个东西，那它有什么用呢？

if you leave the game without feeling that you understood that purpose

如果你在离开游戏时，没有感觉到你理解了那个物品的用途

then sometimes it can feel a little incomplete or it feels like you know the communication was lost at some point um

那有时就会感觉到有点不完整，或者就像感觉从某一刻起你失去了与开发者之间的交流

you know so there's a lot to think about with regards to uniqueness

所以关于唯一性的问题还是有很多东西需要思考的