Welcome, Broth Brothers (and sisters), as well as Supperstars, to the first episode of the Supper Mario Broth Supper Show podcast. Please forgive me for not singing some manner of theme song, as I am very bad at singing; although I'd like to note that the intro music was in fact composed by me.

Thank you all so much for your contributions! I hope that by now you have seen it with your own eyes – and had the Transparency Report to verify – that Supper Mario Broth's output has increased drastically across the board. The main blog, the side Twitter, and the Patreon are now posting with a frequency and regularity not seen since 2013, and it is all thanks to you. I hope that you will enjoy the podcast – and if you don't, let me know any complaints immediately and I will do my best to rectify all possible issues in time for the next episode.

Today's topic is titled "The Surprisingly Complex Matter of Counting the Levels in Super Mario Bros. 3". But as you will soon find out, the problem with the specific game at hand is merely a gateway to a deeper, underlying issue: a lack of a clear definition of the word "level". What makes a level? How do you define gameplay? And while not even an hour-long podcast can purport to answer these questions – and indeed, I posit that none of them have a satisfying answer – I hope that this discussion can still serve as a window into the difficulties that present themselves when trying to discuss video games with scientific rigor.

It's time to get hooked on the brothers. This is the Supper Mario Broth Supper Show.

Super Mario Bros. 3 is a platformer released in Japan for the Famicom in 1988, and later in North America for the NES in 1990. It was the first platformer in the Mario series to feature a world map, a screen where Mario could move between points of interest on a predetermined, but still branching path, and the player could decide where to go next in an unprecedented display of freedom. In fact, the manual even includes a page with a message from the development staff that specifically makes note of the world map.

It is that world map that will be the source of the problem we are discussing here today. Previous Mario games had a very clear progression, and very clear delineation of levels. All of them were numbered, and you could see what level you were in simply by looking at the information line on the top of the screen which always prominently displayed the level number, or in the case of Super Mario Bros. 2, you could see it on the pause screen. Therefore, there is absolutely zero debate that Super Mario Bros. has 32 levels and Super Mario Bros. 2 has 20, as counting them is a matter of simply playing through the games normally and noting every time the level number changes.

Unfortunately, Super Mario Bros. 3 does not afford us the luxury of numbering all its levels, or give them any identifiers that could be seen by the player. That is not to say it does not have numbered levels - it has plenty, but the numbering is beyond useless for a level count and as we will soon see, only compounds the confusion. But before we try to count them, why do something ourselves if we could get someone else to do it for us? Perhaps Nintendo themselves have provided the number, possibly on the back of the box, or in the manual. Since they are the ultimate authority on the matter of their own games, whatever they say would have to be true... or at least an "official answer" that we could close the book on.

Of course, such an answer does not exist. Nintendo cleverly avoids not just listing a level count, but even a world count on the back of the box, presumably because "8 worlds" would

not sound impressive to someone who recently finished playing Super Mario Bros., an at the time three-to-five-year-old game (depending on region) that also had 8 worlds. When we turn to the manual, we discover that while it does list 8 worlds, it also has no plans to divulge a level count. Moreover, the manual does not even use the word "level", instead opting to call them "action scenes". a nebulous term not even well-defined in the manual itself.

With the primary sources exhausted, we turn to the secondary ones: guides published under the Nintendo license. For the purposes of this podcast, I will look at one Japanese and one American guide. While I do not have access to any of the officially licensed Japanese guides published for the original Famicom release of Super Mario Bros. 3, I do possess scans of a guide for Super Mario All-Stars, the so-called "Super Mario Collection Shogakukan Book" released in 1993, which according to the information I could uncover, should contain a near-identical recapitulation of the contents of the Famicom guide, and as such be equivalent to it in terms of level count. For the American guide, I will use the widely available 1990 Nintendo Power strategy guide for Super Mario Bros. 3, which is regarded as the highest authority on the topic in English-speaking territories. In fact, the monumental Super Mario Wiki at mariowiki.com, the largest collection of Mario information in existence, copies the level count directly from that guide.

As we peruse the two books, we find the one looming problem that led to the idea for this podcast in the first place: the level counts provided in the two guides, both official and made under the supervision of Nintendo employees, do not match. Not even sources that had all the information they possibly could at the time agreed on the number of levels in the game. This fact alone indicates a vast complexity to the design of the game, but let us take a closer look. What are the guides' numbers, and what exactly do they disagree on?

The Shogakukan guide claims that the game has 90 levels; a number that is instantly credible due to being round. Certainly due to the prevalence of video games with a round number of levels, this count seems very plausible. The Nintendo Power guide, however, lists 88 levels... or possibly 89, depending on how we define the guide counting something as a level. And if you thought that last sentence was troubling, this is merely the tip of the iceberg. You see, neither of the guides gives us the number, a total count represented with numerals, anywhere within their pages. To find it out, we must carefully page through the guides and count every instance of a "level info box", which is a unifying graphic design element used by both guides to denote whether something is a level.

If we only count the level info boxes, the Nintendo Power guide lists 88 levels. However, looking at the contents of the boxes reveals that they all share another thing in common besides the design: they all include a complete map of the area in question. In neither of the guides, maps of non-level areas are provided. Taking this into account, one area in the Nintendo Power guide is described in a "tip" box instead of a level info box, but which still includes a full map of it: the Treasure Ship. For comparison, the ship is not listed as a level or given a map in the Shogakukan guide. Thus, depending on how we want to count levels in the Nintendo Power guide, it lists 88 level info boxes, or 89 full maps, which is still 2 or 1 fewer than the Shogakukan guide. What is causing the discrepancy?

As it turns out, the Shogakukan guide lists the Hand Trap areas in the second map screen of World 8: Dark Land as three separate levels, while the Nintendo Power lists them as one. The question of which of these is "more correct" will be tackled once we get to the areas in

question during our full analysis of the game; what matters now is the undeniable fact that 1. no primary sources for the level count in Super Mario Bros. 3 exist, and 2. the secondary sources disagree with each other. All the systems we have been conditioned to rely on have failed us, and it is time to take the matter into our own hands. Let us count the levels in Super Mario Bros. 3.

Now, the idea that we would do better at this task than the professional guide-writers of Japan and the US may seem preposterous, even arrogant. After all, we are merely consumers of Mario - enthusiastic ones, to be sure - but we have had no hand in creating the product, and so our statements should be limited to opinions on how we personally liked it, rather than judgments of how it was intended to be constructed. Well, I posit that we have one advantage over the writers of the guides - our position in time. Over 25 years have passed since the guides were published. Not only did the Mario franchise grow by several orders of magnitude in these years, but so did the video game industry in general, and our knowledge of game mechanics, design and everything else that goes into making a video game. In 1988, the year of Super Mario Bros. 3's publication, the idea of college courses about video games was laughable; at the time of the Shogakukan guide's release, it was outlandish; now, these courses are commonplace. Countless books detailing the science and art of creating video games have been published, and we are now in a much better position to analyze games than people - even the most qualified people - 25 years ago. In short, we are standing on the shoulders of giants.

Certainly, we can count some levels in a video game close to celebrating it 30th anniversary... right?

[laughs]

Wrong. As we will find out, our giants will need to grow a whole lot taller if their shoulders are to reach the dizzying heights of the Suprisingly Complex Matter of Counting the Levels in Super Mario Bros. 3.

 A good way of tackling a new, previously unknown problem is to use the naive approach, that is, to think of the simplest possible way the situation might be able to be resolved, and try that first. This has several advantages. First, the naive approach might actually solve the problem, in which case you save yourself the effort of thinking of a more complex solution. Second, if it works, and the same problem keeps coming up in the future, new solutions can always be developed without stress as the naive approach is always there to fall back on. Finally, if it doesn't work, it usually reveals more crucial information about the problem with its failure.

In our case, the naive approach would be to look at how levels were counted in previous Super Mario Bros. series platformers, and apply that exact logic to Super Mario Bros. 3. The levels in Super Mario Bros., the Japanese Super Mario Bros. 2 (known internationally as The Lost Levels) and the US Super Mario Bros. 2 are all numbered. Therefore, one simply needs to count all the different numbers. And what luck, Super Mario Bros. 3 has numbered areas on each world map, as well! Let us count them.

World 1 has 6. World 2 has 5. World 3 has 9. World 4 has 6. World 5 has 9. World 6 has 10. World 7 has 9. And World 8 has 2.

These seem a bit haphazardly distributed, and World 8 appears to be very short, but this is no cause for alarm just yet. Let us add them together for our full level count.

56. Now this is rather peculiar, considering that it is roughly 1/3rd less than the official counts from the guides. But perhaps the guides are merely embellishing things, trying to make us justify the purchase of the game by presenting non-level areas as levels. And after all, 56 is not an implausible number. It is still greater than the level count of any Super Mario Bros. platformer released prior. If that number was advertised, people would still have been impressed.

Now let us talk about disproving hypotheses. This is very easy. All you have to do is find one counterexample, and the hypothesis is no longer valid, and needs to be either discarded or modified in such a way that it addresses the counterexample. To disprove that the game has only 56 levels, which are all numbered, we must find an area that should be counted as a level, but is not numbered. Of course, "should be counted as a level" raises the question of what exactly a level is, but we are not ready to tackle this yet. Luckily, we have one tool on our side that lets us find things that should be levels without an explicit definition. This is called inductive reasoning. If we can describe what all level have in common and how they behave, then find something that fits that description, then that thing will probably also be a level. Note that inductive reasoning is not guaranteed to produce correct results; it is merely likely to produce them. With that said, let us try to describe what all numbered levels have in common.

They all have a timer that ticks down, they all have enemies that can harm Mario, they all consist of at least one room that is bigger than a screen, so that it scrolls, either automatically or based on Mario's movements. Finally, all numbered levels end with an area where the background is solid black and a card roulette block is suspended in midair, which will give Mario a card (collect three matching ones to get extra lives or any other combination for one extra life) and end the level. Note that the card roulette block is called a "Goal" in the manual, but that name is very generic and not helpful for our discussion.

On the world map, all numbered levels consist of a panel with a number on it (called an "Action Scene Panel" in the manual) which will not let Mario move across it, merely on top of it. When the A button is pressed, Mario enters the level. When the level is beaten, the Action Scene Panel turns into a so-called Clear Panel, a panel with an M (or L if playing as Luigi in two-player mode) on it. The Clear Panel is no longer interactive and functions the same as an empty space on the map.

Now, to find a counterexample to the claim of 56 levels from our naive approach experiment, we only must find another area in the game that acts precisely like the previous description, but is not numbered. And that is quite easy, as we find one as early as in World 2: Desert Land. In the middle of the World 2 map is an animated panel depicting quicksand, leading to the area the Nintendo Power guide calls "World 2-Desert", but which I will call World 2-Quicksand due to the guide's name being easily confused for the name of the world itself. (To jog your memory, this area is the famous location containing the Angry Sun enemy.) It acts entirely the same way as a numbered level panel, not letting Mario move across, and turning into a Clear Panel when beaten. The area itself consists of a single, wide horizontal room which scrolls, contains enemies, has a timer, and ends with a card roulette block on a black background. To summarize, it is like a numbered level in all aspects except that it uses an

unique panel instead of a numbered panel.

Now, the first thought that comes to mind when trying to defend the 56 level hypothesis is "It's special, so it's an exception. It does not count." However, a thought experiment will reveal why this line of reasoning is faulty. Imagine that instead of merely a few levels in the game, like World 2-Quicksand, using unique panels, half of them did. Simply exchange half of the existing numbered level panels for uniquely designed ones, but otherwise change nothing about the areas. Would they still be "special" and "exceptions"? By applying a tactic called reductio ad absurdum ("reduction to absurdity"), we can ask, would we only count the game to have one level if we only left one of the original numbered level panels and changed the rest? Of course not. If we already decided that the game has 56 levels, changing some visual aspect of their world map presentation does not result in them losing their level status. Thus, the World 2-Quicksand area must be acknowledged as a level as it fulfills all other requirements.

As we now have 57 levels, and the hypothesis had 56, it has been disproven and we can say with certainty that the naive approach has been a failure. However, even a failure can lead to new insights. Obviously counting numbered levels did not work, but trying to find levels based on commonalities between areas did - at least for now. We are not yet ready for the fully-fledged scientific method, so the next step after discarding the naive approach is to try the heuristic approach.

The idea is the following: We start off by deciding some baseline for what we will consider levels, then go through the game and compare everything we see to those levels. Things that are similar enough will be considered levels, too; things that are too dissimilar will not be considered levels. Sounds simple, right?

[laughs]

Wrong. Super Mario Bros. 3 is a game that likes throwing almost any combination of traits for a playable area at you, and the distinction between what is "similar" and what is not soon becomes impossible to make.

In the beginning, let us postulate that numbered Action Scene Panels are levels because levels were numbered in all previous games in the series. We have to start by declaring something a level, and this is the closest to a good argument we have. This means we are starting where the naive appproach left off - 56 levels are already assumed, and now we are trying to find the others. But before we start the game and go through the world maps, some terminology.

Anything accessed through the world map that is not a world map itself will be referred to as an "area". An area may consist of several "rooms". A room is any part of an area that I will refer to areas determined by some manner of reasoning to not be levels as "non-levels". The game thus consists of: the title screen, the world maps, any number of levels and non-levels accessed through the world maps, and the ending/credits scene that gets special mention because it is non-interactive and cannot be called an NLGS due to containing no gameplay.

A brief note on "non-interactive": in the strictest sense of the word, no segment of any video game is truly non-interactive as the console can always be reset or powered down, thereby interrupting the segment. However, I am using a less rigorous definition of "non-interactive"

which simply means that nothing the player does can affect the scene in any manner except for somehow interrupting or exiting it. This also applies to modern video games with cutscene skip features like Super Mario Odyssey; just because a cutscene lets the player press a button to skip it does not make it interactive.

With all that said, let us take a look at the world map. It consists of a grid that Mario can move along, with grid points, or "nodes", being connected by paths that are 1 tile long. The only purpose of paths is to make the maps less visually cluttered and to lock passages by placing locked doors or hiding paths under rocks. When Mario is standing on a node next to a rock tile, a Hammer item can be used to clear the rock if a path is hidden underneath it. Outside of that, all action happens on the nodes. Nodes differ between "empty" and "occupied"; empty nodes are represented by a small coin icon and can be passed through freely, while occupied nodes greatly vary in appearance and modes of interaction, and present the vast majority of the game's content, and thus we will have to decide their level status on an individual basis. Another feature of the world map is moving objects. These are usually some variety of Hammer Bros., although N-Mark Spade Panels and the Airships appear often, while White Mushroom Houses and the Treasure Ship appear rarely. Moving objects will automatically engage with Mario and transport him into an area when he touches them, instead of having to press A like with most (but not all) occupied nodes.

As we enter the world map for World 1: Grass Land by selecting 1 Player Game on the title screen, we find that Mario starts on a special type of occupied node called the Start Panel. This panel has no purpose except to show that Mario starts there, and even though a path appears to lead offscreen from it, that path is non-functional and is intended as decoration to imply that Mario had walked to the world map from somewhere else. The first panel Mario encounters is a numbered Action Scene Panel, which we have already determined to be a level.

Now is the time to lay down the heuristics that we will use to try to determine if something is a level. As I said before, all numbered levels have the following in common: a timer that causes Mario to lose a life when it runs out, at least one enemy that will hurt Mario when he touches it, the necessity for the screen to scroll, either by Mario's actions or automatically, to successfully exit the area, and a card roulette block on a black background at the end. You may wonder why it is necessary to specify the scrolling or the enemies; after all, if you have played Super Mario Maker, you will probably have seen many levels (called "courses" in that game) that consist of just one non-scrolling screen with the start and the goal both visible at once, or courses that manage to be just as engaging as regular courses despite containing no enemies - and no one would argue that those are not real levels, as Super Mario Maker clearly defines a level as anything it will let you upload to the network, i.e. an area with a start and a goal where you can demonstrate at least once that you can reach the goal from the start within the allotted time.

But Super Mario Maker's definition, while elegant, will simply not work on Super Mario Bros. 3. As we take a look at the other types of panels Mario encounters, you will see why specifying the enemies and the scrolling is necessary.

World 1-2 is just as straightforward as World 1-1, but World 1-3 presents a slight hiccup in that, due to the famous "duck on the white block" secret, it is possible for Mario to go behind the black section at the end of the level and become transported to a screen where the only way to exit is to press B in front a chest, whereby Mario will obtain an item and the screen will

fade out. Luckily for us, this is merely an optional exit, so we do not have to modify the heuristic... yet. The level still has a regular card roulette block exit, so we are in the clear for now.

World 1-4 is the first autoscrolling level, as well as the first level where the card roulette block is in a different room from the one Mario starts the level in, but we have specifically provided in our heuristic for the first one and the second one does not concern any of our rules. It has been relatively smooth sailing so far.

And now we come across a completely different type of occupied node: a Toad House. Even on the world map, it behaves differently from Action Scene Panels, as it allows Mario to pass through it without entering and clearing it first. Upon entering it, Mario finds himself in a single-screen room with Toad and three treasure chests. There is no time limit, and there are no enemies. There is, due to the size of the room, no scrolling, and there is no card roulette block and its associated black section. None of the heuristics we have made for levels apply here; in fact, this is, from the viewpoint of the current rules, the "anti-level". Thus, we can easily determine the Toad House, and by association any further Toad Houses we will encounter, to not be levels.

After the Toad House, we come upon something even less like the numbered levels: a Spade Panel. Just like the Toad House, it is skippable on the world map. Entering it takes us to a brief non-interactive scene of Toad explaining the operation of a slot game to Mario, whereupon the actual slot game starts.

This is our first time controlling something that is not Mario (or Luigi, in two-player mode). We are now controlling the slots. In typical video game vocabulary, this is a minigame. Now, in this podcast we will spend entirely too much time trying to define a level, so defining a minigame is entirely outside of the purview of this discussion, but informally, this type of gameplay is precisely what one would call a minigame. Not only does it not have a timer, enemies, scrolling or a card roulette block goal, the concepts of "enemies", "scrolling" or "goal" do not even apply to it. If the Toad House was the "anti-level", the Spade Panel is the application of the Buddhist idea of "mu" to levels. "Mu" is a word meaning, literally, "nothing", and to answer "mu" to a question means to suggest that the question cannot be answered with "yes" or "no", or perhaps at all, as it is in some way flawed. The Spade Panel is not a level, but it is also not a non-level. It is a completely different kind of gameplay... however, we are not here for philosophy, and we are still beholden to standard two-value logic as known from mathematics, so a non-level it is.

After clearing the top half of the World 1 map, we are forced to tackle what the manual calls the Mini Fortress, and what the Nintendo Power guide calls World 1-Fortress. In the beginning, the area seems level-like, the enemies, timer and scrolling are all there. This is the first area that features doors connecting rooms instead of pipes, but this is another one of the things we do not currently regard as relevant. Finally, arriving at the last room, Mario faces not a card roulette block as in the numbered levels, but a boss battle. Boom Boom activates once Mario approaches him, and prevents Mario from leaving the room. For the first time since the beginning of the game, Mario has no choice but to defeat the enemy. Note that if we take the "Japanese timeline" of Mario games where The Lost Levels was immediately followed by Super Mario Bros. 3 and the US Super Mario Bros. 2 was not released until 1992 as "Super Mario USA", this is the first boss battle in the Super Mario Bros. series where Mario is

required to hit the boss to proceed, as all Super Mario Bros. and The Lost Levels boss battles could be won by running past the boss.

Boom Boom takes three hits to defeat, briefly becoming invulnerable after the first and second hit. After his defeat, he drops a ball with a question mark on it, which the manual calls a "Magic Ball". Brief aside: the green orb with a question mark on it from the Super Mario World level "Sunken Ghost Ship" is most likely intended to be a reference to the Magic Ball from Super Mario Bros. 3, as that level is a ship and likely represents one of the Airships from this game. This is odd as Magic Balls appear only in fortresses in Super Mario Bros. 3, not on airships. At any rate, touching the Magic Ball exits the area. Now let us analyze whether World 1-Fortress should be called a level.

It has enemies, a timer and scrolling, but it does not have a card roulette block. This is a much harder case than the Toad House earlier: whereas that was an automatic "no", saying "no" to an area that fulfills 3 out of 4 level requirements may seem too strict. However, there is one detail about the collection of the Magic Ball that can push us towards a decision. Just like finishing a numbered level by touching a card roulette block gives Mario a point bonus based on remaining time, so too does touching the Magic Ball. This is opposed to other methods of exiting a level, such as the optional exits we glossed over earlier, that do not award a bonus based on remaining time. Going off of this information, and seeing how the Magic Ball method of area exiting is almost exactly identical to the card method except it does not award you a card, let us call World 1-Fortress a level.

Now that we've established fortresses as levels, the heuristic must be amended to include Magic Balls, or things equivalent to them in function, as a means of exiting the area. With these new rules, let us continue. Worlds 1-5 and 1-6 are entirely ordinary compared to what we've seen so far, but then we run into our biggest problem yet. The Hammer Brother.

The Hammer Brother is the first moving object we encounter on the map. He moves every time we beat a certain kind of area - it is tempting to say "every time we beat a level" but that definition won't hold water, as we will see - and automatically activates his area when he touches Mario. The Hammer Brother's area is a single, non-scrolling screen, but it does have a time limit. The Hammer Brother is the only enemy on screen, and must be defeated to exit the area. After he is defeated, a chest appears - in one of two different positions on the screen, always the one further away from Mario - and touching it awards Mario an item while simultaneously exiting the area successfully without bonus points awarded for timing, just as the optional exits from the established levels. In addition, clearing the Hammer Brother does not create a Clear Panel, unlike everything else we're encountered so far.

Let us review. The enemies and the timer are present, while the scrolling and the point-awarding goal do not. It's split exactly 50/50 between being a Toad House and a numbered level in its relevant aspects. In fact, those are two ways to look at it. The Hammer Brother is either a Toad House with an enemy and a timer, or a regular level without scrolling or a goal. Both are equally valid, and both are equally useless in trying to determine the level status of a Hammer Brother.

But wait! There is a straw we can grasp here. So far, all levels have been stationery occupied nodes. The Hammer Brother, however, is a moving object and does not leave a Clear Panel behind. Perhaps this is the push towards non-level territory we need. Now it's not 2-2, it's 2-3

in favor of the Hammer Brother not being a level. What a relief. Onward to the final occupied node on the World 1 map, the castle (called a fortress by the manual, but we have now been through decades of end-of-world levels being called castles, so I choose to call it a castle for clarity).

Entering the castle activates another Spade Panel-like non-interactive cutscene, where a Toad tells Mario that the King has been transformed and that the Magic Wand that can turn him back has been stolen. Pressing A after reading the dialogue results in a heretofore unseen type of cutscene where Mario moves of his own accord to grab onto the anchor of an airship, whereupon the chain pulls him up.

The next scene begins the actual playable area of the airship. The structure of the level is identical to 1-4, the previous autoscrolling level, except that the scrolling is more sophisticated and follows a curve rather than a straight line. The enemies and timer are also there. At the end of the airship, the horizontal scrolling stops (although a minor amount of up-and-down vertical scrolling remains) and the only option is to enter a pipe leading into the ship. Inside is Larry Koopa, the first of the seven Koopalings serving as bosses of all worlds except the last. Larry Koopa may have different attacks from Boom Boom, but the structure of the battle is the same: hit him three times to defeat him. As he flies offscreen after his third hit, down falls the Magic Wand. Even though visually the Magic Wand is distinct from the Magic Ball, touching it results in the same end-of-level timer-dependent bonus, as well as a non-interactive cutscene of Mario falling down from the sky into the castle and the newly transformed-back king congratulating him, as well as giving him a letter from Princess Peach with an enclosed item.

Since the airship has enemies, a timer, scrolls, and ends by picking up an item functionally equivalent to a Magic Ball, that makes it clearly a level according to our updated heuristics. Cut and dry, right?

Wait a second! Haven't we forgotten something? That's right. We have forgotten to die.

Should Mario die on the airship, an unexpected development occurs. Instead of Mario simply being ejected back into the world map and nothing else happening as with previous occupied node-type areas, Mario is ejected onto the castle node, while the airship suddenly appears as a moving object on the map screen and flies towards a randomly chosen unoccupied node anywhere within the map. The level has decoupled itself from the node it was entered in, and is now a moving object. But it is still a level - since we just decided it was. And if it is a level, and also a moving object, that means "being a moving object" is no longer an argument against being a level.

With this in mind, let us recall why we rejected the Hammer Brother as a level. His area had enemies and a timer, but no scrolling or a bonus-awarding goal, and the tiebreaker was that he was a moving object, making him not a level. However, now we know that moving objects can be levels, and the tie is again unbroken. The heuristic keeps failing us with the Hammer Brother.

And so, after only one world analyzed, we retire the heuristic approach due to a disappointing track record. No, this will not do. We need to bring out the big guns. We need the scientific method.

The scientific method has long been the foundation of natural science. It revolves around a loop of hypothesis, testing, and theory building. The world is observed, and a hypothesis then posited about how the world may function. The hypothesis is then tested; if it holds up to all tests, it is accepted as a working theory about the world (working as in work-in-progress, as most theories get either entirely or partially disproven given enough time), and if it fails the tests, the information from the failure is used to build a better hypothesis. We will try to apply this method to level counting in Super Mario Bros. 3.

But what would our "test" be? From the beginning, we have tried to count the levels in a way that would seem consistent. And in the end, "seeming consistent" is only our own feelings about the subject. To paraphrase, what we want to achieve is a rigorous definition of what a level is that fits most with our intuitive understanding of a level, something that is impossible to put into words directly. The Shogakukan and Nintendo Power guides had plausible level counts; what made them plausible is that they counted the levels in a way that, while not rigorous, was intuitive. Just like scientists trying to create a robot that, given only logical and deterministic programming, tries to emulate the behavior of an unpredictable, emotion-driven human, so will we try to define levels using clear rules in such a way that it satisfies our expectations.

[laughs]

We will fail. Many people have attempted this before and all of them have failed, as well; and to assume in the face of such odds that we will succeed is pure hubris. But let's give it our best shot, should we?

Here's a little information on definitions: working on a definition is like sculpting a block of marble. You don't add marble, you remove it. We must understand that the longer a definition is, the more precise it is, and the fewer objects it applies to - just like the sculpture uses less and less marble the longer one continues chiseling, but becomes more and more detailed at the same time.

With this in mind, it would be logical to invert the approach we had previously. Instead of starting with a small set of levels and trying to add more, we will start with a definition that is as broad as possible that it covers literally all gameplay in the game, and keep adding qualifiers to it to make it more refined and only applicable to the things it should instinctively apply to. And now, let us come up with our first definition. What is all gameplay in the game? How can we encompass all of it?
Hypothesis 1: "Every single unique scene in Super Mario Bros. 3 is a level".

What is a unique scene? Well, we know that the console cannot load everything in the background. The NES, or Famicom is not exactly equipped to handle the seamless immersion of The Legend of Zelda: Breath of the Wild. Therefore, whenever an area, or the world map, or a cutscene, or the title screen, or even another room within the same area need to load into the console's memory, there is a period of at least one frame of the screen displaying a solid color, usually black, but sometimes white or another color. We will refer to everything between two of these loading frames as one scene. How to define "unique", however, is a much harder task. I am sorely tempted to simply say "you know what I mean, don't you?" But that is the double-edged sword of rigorous reasoning: while the conclusions gained by this type of argumentation are the most sound, it also does not allow for shortcuts

and ambiguity. If I define one thing, I must define all of them. So here is my attempt at clarifying what I mean by "unique": a scene is not unique if it is identical to a previous scene, and unique otherwise. Two scenes are identical if they contain the same tiles and the same objects at the same coordinates within the scene. Sounds easy enough, right? And luckily, no area layout in Super Mario Bros. 3 is randomly generated, so we do not have to worry about infinite variations of one level... right?

[laughs]

Extremely wrong. This is not a widely-known fact, but Super Mario Bros. 3 does in fact randomly generate at least one aspect of some of its areas - which can be seen as early as World 1-1, the first area in the game. If Mario obtains a Raccoon Leaf and flies upward, faint white outlines of items can be seen in the sky in the background: mushrooms, flowers and stars. It is rather difficult to memorize their exact locations, as they are mostly far away from any landmarks, being high in the sky, and so only few players will notice that every time they load the area, the positions of the items in the sky changes.

That's right, Super Mario Bros. 3 has randomly generated backgrounds. The exact positions of the items seem to depend on the NES's clock that simply counts the frames since the console was powered up. Therefore, entering World 1-1 after doing the exact same input will result in the exact same item layout (visible with tool-assisted speedruns.) But in practice, every time the player enters 1-1. the frames of the inputs will be slightly off, and the items will never look the same.

Note: I do not know enough about the internals of Super Mario Bros. 3 to be even close to determining how many different combinations of item placements there are, We can, however, assume there are at least hundreds, if not thousands or more, of them.

Therefore, we do not even need to evaluate the rest of Hypothesis 1 to know that it is useless due to being too broad, as - consider this for a second - it already counts the very first area in the game as hundreds or potentially much larger numbers of levels. This is nowhere near plausible, or expected, or the numbers given by the guides. Back to the drawing board. Hypothesis 2: "Every single scene in Super Mario Bros. 3 that is unique in terms of gameplay-relevant content is a level."

A new phrase has appeared - "gameplay-relevant". To understand it, we must define "gameplay". Spoiler alert: hundreds of books have been written on the topic, and no two of them agree on a single definition. Therefore, attempting to give a general definition of gameplay appears to be a fruitless endeavour. Instead, a more promising course of action is to try defining gameplay for only Super Mario Bros. 3.

Gameplay in Super Mario Bros. 3 consists of two cases: moving Mario (or Luigi) within areas, and non-area scenes such as the world map or title screen as well as areas that do not include moving Mario (or Luigi), such as Spade Panels or N-Mark Spade Panels. We will refer to the first case as "platforming gameplay" and to the second case as "side gameplay".

Platforming gameplay consists of the player using the NES controller's buttons to cause Mario to move (or Luigi, who I will now stop referring to in the hopes that I have said "or Luigi" enough times for it to be implicit by now), with the goal being to exit each area in a particular

manner to return to the world map with the area marked "completed", or in case of World 8-Bowser's Castle, to activate the ending. Mario cannot just move in a straight line to the object that lets him exit; he is impeded by interactive entities of three kinds:

a) Gravity is constantly exerted upon Mario. If Mario is not currently standing on a platform, he will move downwards. When Mario touches the bottom of the screen, he exits the area, but the area is not marked complete, resulting in Mario needing to attempt to enter the area again and exit it in the proper way; in addition, one life will be lost, and losing all lives resets much (but not all) progress on the current world map.

b) Stationary objects interact with Mario. Now we have to define "interact", which may seem as daunting as "gameplay", but is in fact much simpler. An object interacts with Mario if and only if there is at least one action that Mario can perform that would result in a different outcome if the object was not present. ("Outcome" in this case can have a very rigorous technical definition of "the state and position of all tiles and objects in the scene minus the one removed, as well as Mario's life, coin and score counts"). For example, if a single block above a pit is removed, Mario could jump where the block once was, fall into the pit, and die, which is definitely a different outcome. However, if one of the decorative bushes in the background of the beginning of World 1-1 is removed, no action Mario could perform would be affected by this. Hence. the block is interactive, while the bush is not.

c) Moving objects that interact with Mario. Same rules apply to moving objects as to stationary ones.

This definition takes care of the sky item problem. Since they are non-interactive, they are not gameplay-relevant, and finally World 1-1 only counts as one level... or does it? Back to this in just a second.

We still have not defined what is gameplay-relevant concerning side gameplay. Since there are multiple different kinds of side gameplay in the game, we will define an object being gameplay-relevant to them if and only if removing it or replacing it with a different object would enable the player to perform an action that could affect the outcome during the next scene transition. (A scene transition, as discussed earlier, is the one-frame window when the screen displays a solid color between loading different scenes.) For side gameplay, we will define "outcome" as Mario's power-up state, his item inventory, the life count, the coin count, the score, and the position of all elements on the world map. Therefore, changing the logo object on the title screen to read "Super Mario Bros. 2" instead of "3" will not affect the outcome, as selecting any of the modes will still start them with the same parameters. However, changing one of the N-Mark Spade Panel's cards from a 10-coin to a 20-coin value does affect the outcome, as Mario will no longer be able to match all the cards, and thus lose coins compared to the unaltered scenario.

With the definitions out of the way, let us look at World 1-1 under the lens of Hypothesis 2. The sky items no longer count, so we determine that the scene Mario enters when he moves over the World 1-1 panel and presses A is a level. But World 1-1 does not only contain that one scene. Towards the end of World 1-1, there is a pipe that can be entered by Mario, and takes him to a room filled with coins creating the shape of the numeral 3, as a reference to the name of the game. Entering that pipe causes a scene transition, and the room is a unique scene, so that makes two levels so far under Hypothesis 2. Seems like a problem already, but

the real problem announces itself when we take the pipe back to the main sub-area. "Back". It's a word that implies we will not be entering any new, unique space, but rather something already visited. Sadly, even though conceptually we are most definitely going back, in reality the scene that is loaded when we exit the bonus room is different from the one loaded when we entered World 1-1.

Why? The coins. World 1-1 contains many coins floating in midair, that can be collected individually by Mario. Then, upon entering the pipe to the bonus room and exiting it again, the coins will not respawn. The scene will load with the coins Mario collected already missing, and under our definition of "unique" - even the amended one regarding gameplay relevance - it is a different unique scene.

In fact, I have glossed over another fault of this hypothesis. We have regarded the world map as a level due to it also being a scene, which is fine in principle - after all, there is some gameplay happening here, and there is no immediate instinctive revulsion to the concept of considering the world map to be a level - however, after clearing World 1-1, we find that the panel for it has been replaced with a Clear Panel, which under our definition of gameplay relevance is different from an Action Scene Panel and thus presents a new unique scene. And if you think it isn't unique enough, consider beating World 1-Fortress, which destroys the Locked Door on the map, resulting in the Hammer Brother being able to take a path towards World 1-1, which he previously could not.

So even under Hypothesis 2, World 1-1 still results in too many levels, one for each possible coin configuration! And in addition, now the world map is many unique levels as well! We've not only made no progress, but made it worse! Excuse my strong language, but this is getting rather silly! For Hypothesis 3, let us think really hard about how to remedy this problem, and while we're at it, to get rid of the side effect of counting bonus rooms as levels.

Hypothesis 3: "Every single area in Super Mario Bros. 3 that is unique in terms of gameplay-relevant content is a level. Scenes modified as a result of Mario's previous actions do not result in the area containing them becoming unique."

Now we are using the word "area" in the hypothesis, which raises the question, why didn't we do it before? Because we haven't formally defined it yet. Also a brief aside on the phrase "raises the question". This is in fact the intended way to word the phrase many people would know as "begs the question". And in fact, linguists now agree that due to the overwhelming usage of "beg the question" to mean "raise the question", the phrases are now synonymous, the same way "literally" has come to mean "figuratively" after decades of use in that sense. So do not take this as me saying "beg the question" is somehow "incorrect" in this context; the golden rule of linguistics is that everything is correct as long as you can communicate effectively, that is, as long as people understand what you mean. But if you are interested in the original meaning of "beg the question" before it came to mean "raise the question", it referred to using a fact in an argument to prove the fact itself, a form of circular reasoning. For example, saying "Super Mario Bros. 3 is the best Mario game because it is better than all other Mario games" is begging the question, as it merely rephrases its argument instead of supporting it.

At any rate, what exactly is an area? We know that when Mario enters something from the world map, that is an area. But that isn't rigorous enough. Let us think about scene

transitions. Whenever a scene transition happens on the world map as a result of any action except using a Warp Whistle or taking a pipe from the Warp Zone, the next scene is not on the world map. We can define this as the start of an area. Similarly, the first time a scene transition returns to the world map since the beginning of an area, that is the end of an area. We will agree that an area is defined as being a series of scenes that is not connected to other areas, only to the world map.

As for the second part of Hypothesis 3, "modified as a result of Mario's previous actions", I will not even bother to define it, because as I am about to show you, no definition could save Hypothesis 3 from falling apart the second we finish World 1-1.

As for World 1-1 itself, it seems to finally be counting as one level, exactly the way we wanted it to all along. It feels good to make progress, doesn't it? Unfortunately, clearing World 1-1 and congratulating ourselves on taking care of the problem of the Action Scene Panel turning into a Clear Panel, something happens. The Hammer Brother moves. This wasn't the case when we started the game, and his movement is definitely not a result of Mario's previous actions! (Note: at least not in a way logically accessible to the player. The game does not have a means of generating random numbers except by looking at player input and plugging it into a complex formula, so technically everything that happens, even "random" actions, depends on the player. However, there is a big difference between the player being consciously in control of an element and the game secretly recording the player's button presses for a formula that uses a pseudorandom function for a direction the Hammer Brother should walk in. Calling the latter "a result of Mario's previous actions" is, while technically accurate, very disingenuous.)

And so, Hypothesis 3 fails to define the world map as one level as well. Time for another round.

Hypothesis 4: "Every single area in Super Mario Bros. 3 that is unique in terms of gameplay-relevant content is a level. Scenes modified as a result of the previous actions of any autonomous object do not result in the area containing them becoming unique."

Finally! This is the first hypothesis that is anywhere close to being usable. Now World 1-1 is one level, and the world map is as well, as all eventualities like Hammer Brothers, N-Mark Spade Panels, airships etc. are taken care of. Things are looking up! Worlds 1-2 and 1-3 both count as one level each, at this rate, we'll be done in no time!

[laughs]

Oh, the frustration has only just begun. We find that the Toad House is a level... but not just one level, but many of them. Again.

You see, there is a little-known secret about Toad Houses. Everyone knows that the items in the treasure chests are randomized; there is no strategy to pick the item you want and you must rely on guessing. However, they assume this is done by placing the individual items in the chests prior to loading the room; the same way this would be done in real life if someone attempted to reenact the scenario. This is wrong. What really happens just underscores the absurdity of trusting video games with anything you cannot explicitly see.

The chests do not contain anything in particular. Instead, whenever Mario opens one of them,

an item from the three available ones is randomly generated. You can easily test this yourself using an emulator. Simply place Mario in front of a chest and create a save state. Open the chest, note the item. Load the save state, wait a different amount of time, open the chest, note the item. If you repeat this around 10 times, you will likely see all three items appearing from the same chest depending on how long you waited to open it. Toad has been fooling us all along.

What this means for our hypothesis is that the area is loaded in a different state every time its scene transition activates, that is, Mario can perform the exact same frame-specific movements within the Toad House and get a different item, since the state of the Toad House is based on literally all actions undertaken by the player since the console was powered on. This is similar to the sky item situation in World 1-1, except that this is actually gameplay-relevant, and in a big way. Anyone who has played Super Mario Bros. 3 can attest that receiving the correct item from a Toad House can make many areas much easier to complete. And so, we must discard Hypothesis 4.

Hypothesis 5: "Every single area in Super Mario Bros. 3 that has the same unique set of outcomes given the same player input is a level. Scenes modified as a result of the previous actions of any autonomous object do not result in the area containing them becoming unique."

Now we have made the hypothesis Toad House-proof. The Toad House is one level with three equally likely outcomes given the same player input within it, rather than a collection of nearly infinitely many levels with different outcomes each. Onward through World 1.

World 1-4 is one level, but with the twist that finishing it with 44 coins collected will make a White Mushroom House with P-Wing inside appear, which will also count as one level. The Spade Panel is now easily identified as one level, as is World 1-Fortress. Note that all the challenges we previously faced with the heuristic approach do not apply here... yet, at least, as right now we are giving everything a blanket classification as a level. Worlds 1-5 and 1-6 follow, both levels, and even the Hammer Brother does not give us as much trouble as earlier, as he is classified as two levels under Hypothesis 5. Depending on where the Hammer Brother is moving along the world map, the actual area where he is fought can only assume two forms: one where the rightmost block has a power-up, and one where it hasn't. The world map being changed by the Hammer Brother's motion is taken care by the clause about "scenes modified as a result of the previous actions of any autonomous object". We must also consider that the Hammer Brother may turn into a Treasure Ship, so that is one additional level.

The airship presents an oddity since it is accessed through the World 1-Castle, and in case of successful first-time completion, the area starts by pressing A over the World 1-Castle on the world map, and ends when the letter from Princess Peach fades out to the World 2 map. However, if Mario loses a life while on the airship, it decouples from the castle and becomes a separate level, as the area now includes no king cutscene and is clearly distinct. Same with the castle; entering it after the airship flies away activates a brief cutscene of Toad telling Mario to hurry, which due to being an area, is also counted as a level.

Now we are done with World 1, for the first time since using the scientific method without running into an area somehow becoming thousands of levels. This is certainly an

accomplishment. Let us count how many levels we have found, and how many the guides have listed for World 1.

We have 17. The guides both list 8.

I will not go into a detailed breakdown of every single world in the game, but running my calculations, Hypothesis 5 results in a total level count of 223. While this is by far not as ridiculous as the "thousands, possibly infinite" levels of Hypotheses 1 through 4, it is still more than twice the amount listed in both guides. Now it is time to look closely at what exactly we are counting here and how we can improve the definition to get a more plausible number.

We are counting
1. all numbered Action Scene Panels,
2. all Toad Houses,
3. all Spade Panels,
4. all fortresses,
5. all Hammer Brothers, many of them multiple times due to multiple possible arenas accessible by encountering them on different nodes on the map,
6. all White Mushroom Houses,
7. all appearances of the Treasure Ship,
8. all airships, three times each, due to the levels being accessible in three different forms: the initial castle+airship combo, the flyaway airship and the empty castle,
9. all pipe connection screens,
10. World 2-Quicksand, a unique panel
11. World 2-Pyramid, a unique panel
12. World 5-Tower, a unique panel
13. World 5-Sky Pipe, a unique panel that looks just like a normal pipe connection but actually takes Mario to an area resembling an abridged version of World 5-Tower,
14. Worlds 7-Giant Piranha Plant 1 and 7-Giant Piranha Plant 2, unique objects that respond to the Music Box just like the Hammer Brothers but do not actually move,
15. Worlds 8-Big Tanks, 8-Battleships, 8-Airship and 8-Super Tank, the four unique objects in World 8 that start an area automatically upon Mario touching them just like Hammer Brothers, but do not move,
16. The three Hand Trap areas in World 8,
17. World 8-Bowser's Castle, which is the only area in the game that ends not by returning to the world map, but by activating the ending,
18. the eight different kinds of N-Mark Spade Panels,
19. the 12 world maps,
and finally
20. the four Battle Mode areas accessible only by engaging the other player in 2-player mode.

This list is the culmination of today's discussion. Hypothesis 5 has revealed to us the full scope of what we are dealing with: 20 completely different types of entities, each with their own properties, that somehow must be sorted into "levels" and "non-levels" in a satisfactory manner.

Now, let us take a step back. How do we decide what a "real" level should be? The scientific method gave us a list of everything that could possibly be one; but to make the ultimate decision, we must abandon it and look deep inside our own minds. We must try to put into

words what makes an area "level-like". And that means it's time for some opinions.

I will start with the least contentious opinion one may have on this subject: a level has interaction. Of any kind, not necessarily the same kind as the rest of the game, but at least some interaction is expected, otherwise it is a cutscene - and a cutscene is usually the one thing people would say is definitely not a level. Note that this is a very soft take on the subject - even a menu has interaction - but at least we can discard the "empty castle" panels as not being levels due to them containing no interaction at all.

Second, a level must have choice. If you put the character in an empty room, whereupon the room is automatically exited after 1 minute regardless of any actions performed by the character, then while there is undoubtedly interaction present, since the character can move around and touch the walls, etc., none of it truly matters, as the player can simply leave the room to get a snack and the outcome would still be the same. In Super Mario Bros. 3, only the White Mushroom Houses give you no choice - Mario must open the chest to leave, there is no way to exit the stage, there is not even a way to die due to a lack of time limit and enemies. Clearly, if we are trying to set any sort of standard for levels beyond simple interactivity, the White Mushroom Houses have to go next.

Third, merely having a choice is not enough. The choice must also be meaningful to the player. Sure, the Toad House gives you a choice between three chests, but as we discussed earlier, any of the chests may contain any of the item at any point in time and is randomized every frame, so the player has zero influence on what the outcome will be despite the nominal "choice" of which chest to open. Illusory choice is not choice at all, and Toad Houses are really just White Mushroom Houses with a thick coat of lies.

Fourth, if a level appears many times without any difference outside of its physical location on the world map, it is one level being entered many times, rather than many instances of identical levels. You would not count entering Super Mario 64's Bob-Omb Battlefield 6 separate times to get its 6 separate stars as 6 separate levels, would you? Would you count the Bonus Game roulette from Super Mario World as more than one level simply because you may access it from any Goal Pole in the game? Would you consider the Metro Kingdom from Super Mario Odyssey to be 3 levels because you can enter it by flying there or through 2 different warp paintings? If you answered "no" to these, then there is no sense in counting each of the 19 Spade Panels as its own level, either. Rather, the Spade Panels on the world map are all one-use entrances to the same Spade Panel level - if we choose to call it a level in the first place; but it is certainly not 19 levels. Same goes for the Treasure Ship - it is one ship that can be accessed up to 7 times in one playthrough, not 7 separate ships.

Fifth, we must acknowledge that some levels may have variations that do not result in them being unique levels. Obviously, this is easy in cases where the only thing changing are the aesthetics, like the World 1-1 sky items, but sometimes it makes sense to overlook slight modifications to the gameplay-relevant segments of the level as well if there are other factors speaking in favor of counting them as one level. Consider the Hammer Brothers in World 3: Water Land. Encountering them on regular nodes over land takes Mario to one area; while blue nodes over water result in a different version of the same area with one tile of water covering the floor. Otherwise, nothing changes; the enemies are still the same, as are the blocks, but most importantly, the reward gained from defeating them is identical. In addition, no matter where the enemy is engaged, when it is defeated, it will remain defeated and not

appear in the other place, since it is one entity moving between positions. Thus, we should consider every Hammer Brother object to be a level, not every single one of every Hammer Brother's arena variations. The same goes for the N-Mark Spade Panels, there may be 8 variations on where the different cards are placed, but in the end, it is fundamentally the same experience. With this point, we are entering the territory of opinions that are hard to back up and devolve more and more into personal preferences; however, I am doing this only to show how many of these preferences went into making the level count of the Shogakukan and Nintendo Power guides.

Sixth, the world map should not be a level. I don't have any arguments for this outside of the fact that it is simply a convention of the video game industry to not list the world map as a level. In the specific case of Super Mario Bros. 3, it can be argued that the world map is basically a glorified menu for selecting the next level. Nothing on it happens in real-time; all moving objects move before Mario can and stand still when he moves. The only time an action on the world map has consequences related to its precise timing is the 8-Hand Traps section, as it uses a random number generator to decide whether Mario is forced to enter the respective areas.

Seventh, if a level is merely an extension of the world map, it should not be a level. In Super Mario Bros. 3, this applies to the pipe connections. They are areas that consist of one screen with two pipes in it. There is a meaningful choice - take one pipe or another - but that choice is simply a lengthy way to moving Mario from one place to another on the world map. If he simply disappeared down one pipe and appeared out of the other, without a pipe connection screen, no gameplay value would be lost... at least unless you are being very technical. You see, the pipe connection screens have, for some inexplicable reason, a time limit. (This was changed to no time limit in all remakes.) What this means is: yes, it is possible to die inside a pipe connection by not moving for an extended period of time, although I personally believe this has only ever happened to people who tried to do it on purpose or who left the room while standing in a pipe connection screen. At any rate, even though the timer adds an element of "challenge" to the act of going from one pipe to another, this is by no means anything but a curiosity and should not be regarded as relevant. The pipe connections should not be considered levels.

Lastly, Super Mario Bros. 3 is primarily a singleplayer game. The four two-player-only areas do not provide a challenge by themselves; they rely on having a human player to compete against. Let us still count them, but separately for a singleplayer and 2-player count.

Applying all of these to Hypothesis 5 results in Hypothesis 6:

"An area accessible by pressing A on an occupied node or by touching a moving object on the world map in Super Mario Bros. 3 is a level if and only if it has a time limit and cannot be passed through without being forced to engage with it unless a Lakitu's Cloud is in effect, or be subjected to a randomized chance of automatically engaging with it unless a Music Box is in effect. Moving objects that are present when a world map is normally first accessed count as one level each, while non-Airship moving objects that appear afterwards count as one level across all world maps where they can appear. Airships in Worlds 1 to 7 are counted once each, regardless of whether they are accessed through a Castle or not. Finally, the Spade Panel and the four two-player battle maps all count as one level each as special cases."

Hypothesis 6 counts the following:
1. all numbered Action Scene Panels,
2. one Spade Panel,
3. all fortresses,
4. each Hammer Brother only once,
5. one Treasure Ship,
6. all airships once,
7. all unique panels, consisting of 2-Quicksand, 2-Pyramid, 5-Tower, 5-Sky Pipe, 7-Giant Piranha Plant 1 and 2, 8-Big Tanks, 8-Battleships, 8-Airship, 8-Super Tank, 8-Hand Trap 1, 2 and 3, and 8-Bowser's Castle.
8. one N-Mark Spade Panel,
9. the four two-player Battle Mode areas.

And the final level count for Hypothesis 6 is... 108 levels in singleplayer mode and 112 in two-player mode.

While it is unlikely that you agree with every single decision that went into the creation of Hypothesis 6, it is curious that the final count is 108, as that number is considered sacred in Buddhism, which has a big connection to Super Mario Bros. 3. Statue Mario, the form Tanooki Mario takes upon pressing Down and B, is based on Jizo, also known as Kṣitigarbha, a boddhisattva revered in East Asian Buddhism.

Thank you for joining me on my journey through The Surprisingly Complex Matter of Counting the Levels in Super Mario Bros. 3. I hope you enjoyed the podcast, and I welcome all feedback, positive and negative, that you may wish to share with me.

I'd like to thank all of my supporters on Patreon for making this possible, as well as all the Broth Brothers (and sisters) as well as Supperstars for deciding to support this podcast. I hope you will join me next month as I take a look at the visual design of Super Mario World that will make this podcast seem short in comparison.

Thank you very much for listening.