

Jurassic Park Notes

THE FILM

- The first scene fools you into thinking a dino is coming in the trees. Instead, it's a crane with a cage. But it has a raptor inside. It helps build anticipation. We do get a glimpse of a raptor eye.
- Raptors exploded in popularity thanks to this film.
- The cave scene with the lawyer and excavator reminds me of the beginning *Raiders of the Lost Ark*.
- "Six-foot turkey." It pays lip service to the emerging idea at the time that dinos had more in common with birds.
- The story with the kid is a great character moment for Grant and establishes how big a threat the dinos will be. Great storytelling.
- John Hammond is *very* different in this compared to the novel. Here, he's a quirky and lovable grandfather; very Spielberg-ian. In the novel, he's a conniving croney capitalist.
- I use Barbasol shaving cream.
- Wayne Knight was flying high thanks to *Seinfeld* at the time. Nedry here is practically the same character as Newman.
- Oh, Malcolm. You wonderful cynic. Jeff Goldblum excels in this roll, using his trademarks "uhs."
- The iconography starts almost in frame one. It was brilliantly used to market the film.
- 20 minutes in, we get our first dinos. The acting, effects, and music come together to create a moment of wonder. Only the lawyer seems less-than-impressed. He's concerned with money.
- "We have a T-rex."
- "Welcome to Jurassic Park."
- "They do move in herds." A line that shows most of what we know about dinos is theory; we can't confirm without firsthand observation.
- "When Dinosaurs Ruled the Earth." The banner references a 1970 film (https://en.wikipedia.org/wiki/When_Dinosaurs_Ruled_the_Earth).
- The animated educational short is wonderful. It provides exposition and does worldbuilding. (This film is archived in the Vault). It's like my writing professor said: start with articles written for children and go from there.
- "Auto-erotica." Sheesh, man.
- Dr. Wu is a lefty.
- It's still wonderful to see the baby dino be born.
- "...pull up the dinosaur's skirts?"
- "Life, uh, finds a way." -Malcolm. Iconic line.
- Feeding raptors a live bull does seem weirdly cruel.
- They're lethal at eight months, and I do mean lethal." -Muldoon

- “Your scientists were so preoccupied with whether they could, they didn’t stop to think if they should.” -Malcolm. He questions whether Hammond’s scientists earned these cloned dinos or if they are playing God.
- These kid actors are remarkably good. The boy may act like a “Kenny,” but he isn’t one.
- Mosquitos have been found in amber.
- “Hold onto your butts!” –(Jackson). This was referenced in *Kong: Skull Island*. (And King Kong is referenced here because of the huge gates).
- “God creates dinosaurs, God destroys dinosaurs, God creates man, man destroys God, man creates dinosaurs.” “Dinosaurs eat man...woman inherits the Earth.” -Malcolm and Sattler
- Malcolm is a bit obnoxious, but he has a point.
- Malcolm flirts with water drops to illustrate chaos theory. Dang.
- Barbasol product placement.
- The practical effects—like the sick triceratops—still look great.
- “That is one big pile of s—t.” -Malcolm. Memes galore.
- I’m not sure if Nedry’s nervousness is an act or not. If it is, it’s brilliant.
- See, JP was sabotaged from within by a greedy employee. Monster Island had to be sabotaged from without.
- The water ripples. Brilliant and iconic.
- 63 minutes in, we finally see a T-rex. Worth it.
 - Endangering kids makes this even more harrowing!
 - The effects are incredible here. Such good integration.
 - The kids are saved by a half-inch of plexiglass and then are nearly crushed and drown in mud.
 - The lawyer dying on a toilet is darkly funny.
- The film wisely has no music in some scenes to create tension.
- The suspense sometimes ends humorously, like with Grant and Tim escaping the jeep in the tree.
- This is a well-crafted, witty script.
- “Must go faster!” -Malcolm
- Grant, who starts off not liking children, is thrown together with Lex and Tim and must protect them. Immersion therapy?
- The shot of JP merch is ironic now. The film is criticizing the commercialism, but this became a huge franchise with such merch.
- The brachiosaur sneezes on Lex, and Tim says, “God bless you!” It was for the sneeze and for sliming his sister.
- The shirtless shot of Malcolm was meme gold, too.
- The science of this film sounds like CRISPR-Cas9 from *Rampage*.
- “Veggiesaurus.” “Meatasaurus.”
- “When Pirates of the Caribbean breaks down, the pirates don’t eat the tourists.” -Malcolm
- Of course Lex thinks Grant faking electrocution isn’t funny and Tim thinks it is.

- Classic Hitchcockian suspense technique: the audience knows something the characters don't. In this case, Grant and the kids climbing an electrical fence.
- The worst violence, like Muldoon's death, is kept slightly out of view to keep a PG-13.
- "Clever girl." Not only iconic but a payoff for Grant's story to the kid at the beginning.
- The gelatin on Lex's spoon is brilliant because you don't know for a sec if she's trembling.
- "Unless they figure out how to open doors." And they do.
- The toe taps reinforce the story about the disemboweling.
- Have Tim give you the gun!
- The binary on the raptor = genetic code?
- There's a lots of build-up to the raptors at the end.
- There's a lot of lucky survival here.
- Ironically, the T-rex saves our heroes. Ironically, I've heard it argued that a raptor slash is larger than a T-rex bite radius and could slice it's belly open.
- The dinos destroy the museum; they are "real" now.
- (I forgot Kathleen Kennedy was a producer on this...).

OTHER SOURCES

- Sources
 - [https://en.wikipedia.org/wiki/Jurassic_Park_\(film\)](https://en.wikipedia.org/wiki/Jurassic_Park_(film))
 - <https://www.imdb.com/title/tt0107290/>
 - <https://www.bustle.com/p/is-ista-nublar-from-jurassic-world-fallen-kingdom-real-the-island-is-home-to-the-movies-biggest-action-9421203>
 - <https://bookanalysis.com/michael-crichton/jurassic-park/10-key-differences-between-the-jurassic-park-movie-and-novel/>
 - Blu-ray special features:
 - "Return to *Jurassic Park*: Dawn of a New Era"
 - "Return to *Jurassic Park*: Making Prehistory"
 - "Return to *Jurassic Park*: The Next Step in Evolution"
 - "Archival Featurette: The Making of *Jurassic Park*"
 - "Archival Featurette: Original Featurette on the Making of the Film"
 - "Archival Featurette: Hurricane in Kauai Featurette"
- Cocos Island, which may have inspired Isla Nublar, touts itself to tourists as "the real Jurassic Park."
- Differences from the novel:
 - The opening has a girl get killed by Compies.
 - Hammond is more of a villain and is only in this for the money. (Sounds like my boss).
 - Dr. Grant gets along with children.
 - Tim is older and loves computers while Lex is younger and likes baseball.
 - Malcolm dies from his wounds. (But Crichton retcons this in *The Lost World*).

- Dr. Wu, like Hammond, is villain and the mastermind of the genetic program. He's also more involved in the story. Dr. Wu dies in the book.
- John Hammond is killed by Compies in the novel in true dramatic irony.
- The park is bombed by the Costa Rican military to keep more dinos from escaping...
- ...because it opened with some having already reached the Costa Rican mainland, as seen in the opening. One is taken to a lab to be studied, which is how Dr. Grant hears about it.
- Spielberg wanted to channel his inner-child directing this. His first long word was “triceratops.” He made this film for dinosaur lovers.
- Spielberg said this was a monster movie but a story about extinct animals brought into the 20th century, which is what Michael Crichton envisioned in the novel.
- Crichton thought there was no pressing need to recreate dinosaurs, so in the question of who would pay for it, he landed on recreation.
- Stan Winston did the practical effects. The designs were based on the latest science of the time. Jack Horner was their paleontological consultant.
- Then T-rex could move its head without recoil; the puppeteer kept it moving—breathing, muscles twitching—even when standing still.
- Phil Tippett was called in at first to do stopmotion/go-motion animation. But ILM showed Spielberg some CGI animation, and he decided to go with that, saying, “That’s the future.” Tippett and his cohorts called it “Black Monday” when they heard they wouldn’t be used. Spielberg says the CGI changed his movie and the world.
- They developed the DID (dinosaur input device), which was a stopmotion armature with digital inputs that uploaded the movements into a computer. It bridged the gap between the disciplines.
- David Koepp added the character dynamics, and the cast added legitimacy.
- Spielberg would do dinosaurs growls on a bullhorn on set.
- Sam Neill says the acting part was “not laughing.”
- JP was originally going to be filmed in Costa Rica, but due to concerns with infrastructure, it was filmed in Kaua‘i in Hawaii.
- The Barbasol can was purchased on a whim. The script only described it as a shaving cream can.
- The sick triceratops was one of the first scenes filmed. It set the tone for the actors.
- The actress for Dr. Sattler says she’s asked by a kid at every restaurant if she’s the lady who played with dinosaur poop.
- Production was delayed by a category 5 hurricane. The crew’s hotel was landfall. Surviving it brought the crew together. Attenborough slept through it. Spielberg told him he missed the hurricane, and he said, “I survived the Blitz.”
- Spielberg storyboarded everything. He used a lipstick camera and models. Then Phil Tippett would recreate his shots in stopmotion. The storyboards were followed religiously.

- Spielberg called saying he was in the car listening to Earth, Wind, and Fire, and the rearview mirror shook. He said that's what they needed in the film. The sound guy experimented with this by playing a guitar.
- Fay Wray visited the set. Spielberg joked that the film would be dedicated to her because of her famous scream.
- Multiple puppeteers operated the dinos off camera—like classic tokusatsu.
- Spielberg wanted the T-rex scene in the rain, but Winston didn't know how the puppets would react to it. The rubber in the T-rex got behavior when wet. The kids would slap it towels to dry it off.
- The T-rex roar is several animals layered in. The low sounds are crocodiles and lions; there's even a baby elephant, which did "the most amazing screech."
- It was Goldblum's idea to have Malcolm lure the T-rex away. He was scripted to run away like a scared nerd.
- Spielberg wanted the kids to be attacked by raptors in the familiar, so he made sure to include iconic reference points in the kitchen.
- There was some suitmation for the raptors in the kitchen. All the special effects techniques are in that scene.
- The raptor sounds were a dolphin and a walrus.
- The puppeteers for the raptors were described as a "symphony."
- Computers were used to change a stuntwoman's face to Ariana's in one shot.
- "Four hours of hanging from a bone. You wanted to be an actress!" -Spielberg
- The collapsing bones are a bowling alley.
- It was a late change to have the T-rex killing the last raptor. The raptors were originally going to be killed by being impaled by the dino bones.
- Spielberg had teleconference calls 4 times a week meeting with ILM while making *Schindler's List*. He called it "bifurcating."
- This was the first film to have a digital soundtrack, according to Spielberg. Theaters needed DTS sound systems to hear it as intended.
- This was the only time Spielberg worked with John Williams that Spielberg wasn't there when the music was recorded. Williams wanted to elicit wonder and religiosity when the dinos are first seen. He made the raptor scene operatic, so it was a bit larger than life.
- Spielberg says he used every ounce of intuition making *Schindler's List* and every ounce of craft making JP.
- Sam Neill saw the film with Princess Diana.
- The triceratops is Spielberg's favorite dinosaur.
- "This isn't Gorgo, this isn't Godzilla." -Spielberg
- The archival making-of doc mentions *The Lost World* and, indirectly, the Bone Wars (see our season premiere). It also shows *King Kong*. And *Jason and the Argonauts*.
- Spielberg says dinosaurs have the pull and seduction of mythology, but it's real.
- Spielberg and Crichton were working on a script together when Crichton told him about the JP novel.
- Spielberg called *King Kong* (1933) as an inspiration; it the high watermark he set for JP.

- Spielberg did meet with Bob Burr, the man behind the animatronics in the Kongfrontation ride.
- The raptors at first would have stuck their tongues out like a lizard or snake, but Hoerner said, “No.”
- Dennis Muren showed Spielberg the CGI test.
- ILM had just finished *Terminator 2*. JP was the next great leap forward in special effects.
- Tippett said, “I feel extinct,” when he and Spielberg saw the CGI test. That line was given to Malcolm.
- Spielberg cast not Hollywood icons but honest and naturalistic actors.
- The vibrating rings in the water was said to be the hardest part. They tried lots of sources, but it took playing a guitar string.
- Destroying the dinosaur skeleton marked the end of shooting 12 days ahead of schedule.
- The film has 50 CGI shots.
- Tippett had the animators do pantomime to understand the dinos and animate them properly. They filmed themselves running around.
- The animators referenced nature to get the right movements.
- Spielberg told the sound designers to make noises that don’t sound like Godzilla or Rodan.
- Crichton said his geneticist friends told him recreating dinosaurs could happen.
- Producer Rick Carter likened dealing with the hurricane to the characters trying to control the dinos.

TOKU TOPIC: THE SCIENCE OF JURASSIC PARK

- Sources:
 - See folder
 - <http://dankoboldt.com/science-of-jurassic-park/>
 - <https://ctsciencecenter.org/blog/decoding-dinosaur-genetics-in-jurassic-parkthe-science-behind-science-fiction/>
 - <https://www.looper.com/163131/the-science-behind-jurassic-park-explained/>
 - <https://www.youtube.com/watch?v=TTKcSoQpFaE>
- There’s an entire book about this: *Science of Jurassic Park and The Lost World: Or, How to Build A Dinosaur* by Robert Desalle.
- “Following the release of the first film, paleontologists and archaeologists enjoyed what has been called the “Jurassic Park phase,” wherein enthusiasm for fossils and the pursuit of dino DNA was more ardent than ever. Around this time, great leaps and bounds were made in research into de-extinction, and discoveries that would have usually gone unnoticed by popular press — like the sequencing of an ancient weevil’s DNA — became sensational.” (Wilhelm)
- “What the well paid, highly qualified folks at Jurassic Park are doing is de-extinction: taking an extinct organism and cloning it, giving it life in the here and now.” (Wilhelm)
- Mary Schweitzer discovered T-rex blood vessels and blood cells with nuclei. It was compared to ostrich tissue to prove it. This was astonishing because soft tissue

decomposes rapidly after death. It confounded both creationists and evolutionists. The conditions needed for the preservation of soft tissues in fossils is unknown. (Criswell)

- “These studies show that small DNA fragments (<500 base pairs) still retaining enough of their original sequence integrity to identify the organism of origin would have to be less than 10,000 years old if the specimen was preserved in temperate climates.” (Criswell)
 - Moisture, humidity, and speed of fossilization are factors. The “life” of the tissues can be extended by lowering the temperature.
 - “Molecular biology laboratories keep DNA indefinitely in a freezer at -80°C (although no one, obviously, has done this for thousands of years!), and kinetic studies predict that at polar temperatures (-50°C) the ‘life’ of identifiable DNA may be extended to 100,000 years.” (Criswell)
 - “Some proteins may last even longer (up to a million years) as small peptide fragments of the original complete protein. Other proteins such as collagen, a protein found in bone, probably completely degrade in less than 30,000 years...” (Criswell)
- “DNA has a shelf life—a decay rate of about 521 years, where half of the DNA bonds would be degraded, and then half of the remaining bonds would be degraded after another 521 years. This means that after 6.8 million years, all the DNA bonds would be completely destroyed, and 80-million-year-old dinosaur DNA would not survive. Jurassic Park acknowledges this decay process but asserts that there are holes in the DNA sequence that need to be filled in order to have a complete genome to clone a dinosaur. To solve this theoretical problem, DNA from a frog is inserted into the sequence to fill in these gaps, like fitting in a missing puzzle piece. In reality, the DNA would be so far decayed that there would not be enough of the DNA sequence left to simply fill in the gaps.” (Coletti)
- “Most of this aDNA information has been made possible from the multiple copies of mitochondrial DNA (mtDNA) that are found in each cell and the technology of the polymerase chain reaction (PCR). PCR is capable of amplifying millions of copies of a short stretch of DNA from just a few original aDNA molecules. The complete process of amplifying aDNA from an archaic source has many challenges however, and it is possible that none of the published sequences are valid. The PCR reaction is sensitive enough to amplify DNA from just one molecule of sample aDNA. This means that DNA contamination from humans and microbes that may already be present in the laboratory (from people simply breathing, microbes in the dust, or previous PCR reactions) may lead to amplification of the contaminating organism and not the intended aDNA.” (Criswell)
- One challenge in identifying DNA in a fossil is it was preserved in soil that has other DNA in it (living and dead bacteria, for example). Also, the humans who unearthed the bones probably left some of their own DNA.
 - In fact, a study by the University of California Berkeley claiming to have a 40 million-year-old bee with genetic fragments inside it, so one with dino blood could be found—this was peer-reviewed and discredited.

- Mary Schweitzer and Tracy Staedter write about discovering what appeared to be red blood cells in a T-rex bone in 1997. They did a long series of tests on it, and they believed it was blood at the time.
- “It is difficult to find intact pieces in ancient DNA, especially in amber-trapped insects found in South American rainforest environments, as laid out in JURASSIC PARK. The extraction of the blueprint DNA from this source would probably not produce enough viable genetic information to clone even one deadly claw.” (Hays via Koboldt)
- Recent advances have made this more possible:
 - “Recent reports of successful sequencing project of woolly mammoths (10,000 years old), Neanderthals (38,000 years old), the genome of a girl belonging to an early species of *Homo sapiens* called the Denisovans – a close relation to the Neanderthals – who lived about 80,000 years ago (The study even reports she had brown eyes, hair and skin!). To push the envelope even further, the entire genetic sequence of a 700,000 year old extinct species of horse was published this year in the journal, *Nature*.” (Hays via Koboldt)
- Another challenge is finding proper embryos for the dinos:
 - “In 2014 technology, with advances in stem cell technologies and the ability to reprogram a blank cell with a new set of DNA instructions, perhaps this hurdle could be overcome if we can learn to piggyback on existing natural reptilian systems.” (Hays via Koboldt)
 - “This is because even with all the genetic information, the chromosomes have to be implanted into an embryo. Project Lazarus' embryos died after a few days, never producing a viable fetus.” (Wilhelm)
- Lysine: “...vertebrates do not even produce lysine and it is unlikely that dinosaurs would have needed this genetic alteration in the first place.” (Coletti)
- Default female embryos: “More recent studies have found that embryos initially contain both male and female reproductive tracts. While we don't know the specifics about dinosaur embryonic development, fossilized dinosaur embryos have been discovered, including one oviraptorosaur found in China nicknamed Baby Louie, that have suggested dinosaur embryos' fast growth rate inside the egg.” (Coletti)
- Asexual reproduction: While the African frog angle stems from a 1980s study, those changes require a lot of environmental factors. But: “An all-female species of whiptail lizard reproduces asexually. Parthenogenesis, the process of an unfertilized egg reaching maturity and ultimately hatching, has been observed in many reptile species, such as the dinosaur-like komodo dragon, for instance. Raptors repopulating an abandoned theme park? Life, uh, finds a way.” (Wilhelm)
- “But we might see something that looks incredibly close to a real, live woolly mammoth. A Harvard team has been working on splicing mammoth genes into the DNA of an Asian elephant. The goal is to produce a hybrid ‘mammophant,’ but there is no saying how long that process might take — or if it ever gets approved due to the ethical dilemma around resurrecting a long-dead species. The closest science has come to a real Jurassic Park scenario is the Lazarus Project, which successfully cloned embryos of the extinct gastric-

brooding frog in 2013. Those embryos died after just a few days, but it's considered an astounding success that they ever lived at all.” (Wilhelm)

- Most of these dinos are actually from the Cretaceous Period.
- “Crichton may have been confused when writing about Velociraptors. One of Crichton's favorite research books, *Predatory Dinosaurs of the World*, mislabeled the bigger, badder Deinonychus as a sub-species of Velociraptor. Deinonychus' description better fits the creatures we see on the silver screen, whereas real Velociraptors were small, flighty creatures no taller than around three feet. Recent paleontological finds suggest that they were covered in feathers, their arms like wings. Think big chicken rather than small dragon for an accurate image of Velociraptor.”
- The T-rex hunting by movement theory is discredited now.