CG GARAGE PODCAST #277
BEN PROCTER
PRODUCTION DESIGNER, "AVATAR" SEQUELS

Eager to return to Pandora? Production designer Ben Procter reveals the art department's inner workings and the tech behind James Cameron's vision for Avatar 2.

In 18 months, audiences will be transported back to Pandora for Avatar 2 — and Ben Procter is one of the people who's preparing to take us there. This concept artist turned production designer gives insight into the sequel's seven-year production journey, as well as some of the technology his team and Weta Digital are using to create James Cameron's sumptuous digital world.

Contents

Useful links

Ben Procter's online portfolio >

Ben Procter on IMDb>

Avatar Concept Designs by Ben Procter >

Chris Nichols I have started recording. So a couple of things we're going to do first. So normally, you've listened to us through my podcast and you've seen a couple of them, right?

Ben Procter Yeah.

Chris Nichols And we normally do Polaroids, but of course I can't be with people in person anymore, so I can't do the Polaroids. So what I actually have, I forgot to bring it in here to show you, but I have a machine that is basically you take your phone and you put it on top and it spits out a Polaroid.

Ben Procter Seriously?

Chris Nichols Yeah.

Ben Procter That's awesome.

Chris Nichols It takes a Polaroid, it basically makes a physical Instagram. It's really funny.

Ben Procter Yeah, that's super cool.

Chris Nichols So what I'm going to do is, I'm going to take a screenshot of you and I'm going to make that into something. So we're going to use that. Yeah. Got it. Perfect. Alright, we're good. All right Ben, I have actually been wanting to have you on the podcast for a very long time and I don't know, can you say what movie you've been working on for the last seven years?

Ben Procter Absolutely. Yeah, exactly. And you've got the right number, it's been seven years. I've been on the *Avatar* sequels since late 2013. So yeah, it's been quite a while. It's hard even for me to believe.

Chris Nichols Well, it's interesting because I remember people saying the same thing when they were on the first *Avatar*, some of the concept artists on that. They said, "I've been working on that for, they were like 10 years."

Ben Procter There were people who've been picking away at it for many, many years. I think there was an initial phase where they were working at Jim's house way back in the day. And then there was a more recent one that led up to the period where I was working, where again, they were at Jim's house in Malibu and working with him, which must have been cool. But yeah, I mean, it was fairly, let's see, for me it was a year and a half, which is a long, long time, but I was also on *Transformers* one for a year and a half. So it was not unprecedented for me at that point. But seven years is a different deal.

Ben Procter I mean, you work for a company now, so you understand that for me as someone who normally works as a freelancer, in fact a union employee, of movie productions to be working for this length of time for one employer is just bizarre.

With the same people for that many years, it's bizarre, it's just not how it's supposed to be. I should be working on something for three months, nine months, a year and a half, whatever. But no complaints, it's been terrific. The *Avatar* team from top to bottom, I mean, right from Jim and John who's terrific, our producer, to everybody, the hundreds of people that are working on it. If you had to be stuck with a certain family of coworkers for that long I think we're all in good company. So no complaints here.

Chris Nichols   That's great to hear. Now, because I think there's a lot of misinformation about it, and so you would know best, how many *Avatars* are being produced right now? How many films are being produced? Can you tell me that?

Ben Procter   So we have scripts and initial concept art for four new movies. Originally there were three scripts, so there were three planned sequels. It turned out that what was going be *Avatar 2* had so much amazing story in it that it literally couldn't fit into a movie at the end of the day. So that got split. So the *Avatar 2* and *3* that we are currently finishing out, I guess you'd say we're in post now, we're in a strange state of being both in the middle of live action in the sense that we've done a stint of live action photography, but we still are going to do at least one more.

Ben Procter   But at the same time in post, because it's such a heavily digital movie that a huge amount of virtual production is completely wrapped and all the motion editing and all of the actual film editing and Jim's specific virtual camera moves, and everything that goes into the finishing pipeline of *Avatar*, that has already been started obviously. And what our digital's been working on shots for equivalent time in certain cases, but that turnover pipeline process is now in full gear. So I guess to answer your question, there are four new potential *Avatars* out there. We are in the middle of producing basically *2* and *3* concurrently, if I can say that. The emphasis clearly is a lot more on *2* because we've got to get that finished and get it out.

Chris Nichols   When is that coming out?

Ben Procter   So holiday 2021 is *2*.

Chris Nichols   Okay. So we still have almost two years.

Ben Procter   Almost two years, which in normal world is like, oh wow, we can make like four movies in that time, but in *Avatar* world means, just because of the complexity of what we're doing and the ambition of what we're doing, means that we're under the gun. But we're still going, I mean, despite the coronavirus shutdown and so many things, I feel terrible to say this in front of my industry colleagues, but we are still going, we've gone to a virtual office sort of a setup. And so far it seems to be working pretty well. We have meetings and reviews and everything that we'd normally do.

Chris Nichols It is interesting to see the things that can work and things that can't work, because there are things that can work. And the internet has been basically saving everyone's jobs.

Ben Procter Yeah, no kidding. It's amazing that it's holding up, and I probably shouldn't say that, but the fact that the bandwidth of the internet is actually holding up right now, given the amount of video being thrown around, is insane, including what we're doing right now.

Chris Nichols I know. This going on, the amount of video conferences going on and the amount of Netflix streaming that's going on, and it's working. So it's probably just about to burst.

Ben Procter It's probably about to burst, exactly.

Chris Nichols But if we have been able to operate basically for the last few weeks this way, it's been pretty interesting. I find it fascinating. But before we get to... I know we've already started on what's going to happen in your future, but let's go back to the past because that's always something that's interesting. And I remember the first time I met you in person was at PLF. You were still at PLF.

Ben Procter Was it then?

Chris Nichols Yeah.

Ben Procter That's so funny because I would've said *Tron*, but I forgot that we met before that.

Chris Nichols Because I had first moved to LA and I was interested in finding out more about the visual effects world and stuff like that. And of course Eric Hanson who was of interest to everyone, he's the one who introduced me to you. And I said, "Hey, I'd love to go visit you at PLF." And I went there and you guys were just crammed full of people. It was the first time I'd seen one of those situations where elbow to elbow-

Ben Procter There was no social distancing, that's for sure.

Chris Nichols Elbow to elbow working. And I think I met, for a brief second you introduced me to Colin Green. And he's actually been on the podcast.

Ben Procter Has he? Terrific.

Chris Nichols Yeah.

Ben Procter That's awesome. I'm ashamed, I've only listened to like four of your podcasts, but I've enjoyed every single one, so I've got to expand my reading.

Chris Nichols   But PLF was kind of an interesting thing, that was the days when the idea of previs was kind of a new thing, and that was a really cool thing. So what landed you at PLF? How did you end up there?

Ben Procter   Well look, I'll start if I can, my very first quote unquote, "Hollywood job" was working at a tiny little kind of fly-by-night matte painting company, run by a guy whose name I won't mention, who's not highly regarded by some of the people that worked for him at that time, and it was literally in Hollywood and I had to commute to the shadow of the Capitol Records Building. And I felt like, oh my God, I've moved from New York out to LA. I'm really doing it. But we were also working literally like slaves and I was so tired. I got into a car accident, and as a New Yorker I didn't know how to drive very well. I was just learning literally on the fly in LA how to drive, and it was-

Chris Nichols   How old were you?

Ben Procter   I guess I must've been... That's a great question. 26, something like that.

Chris Nichols   Wow. So you were really New Yorker, New Yorker.

Ben Procter   I was New Yorker, New Yorker. Exactly. Good point. But at that age I had not yet learned to drive and I did a little bit of learning in Manhattan from a company that mainly specialized in training big rig drivers. So this idiot, this 26-year-old idiot who didn't know how to drive a car, was not treated with much respect and I had some hi-jinks. Sorry I'm going off topic, but there's-

Chris Nichols   No, that's fine.

Ben Procter   One driver, I'd say a teacher I should say, came in with a boombox and smoking. Gets into the car, puts the boombox on the dash, almost blocking my view, hits play on whatever it was, starts smoking. He's like, "All right, go."

Chris Nichols   This is a teacher?

Ben Procter   This is a teacher, and it has double control. So he got me onto the West Side Highway, which anybody who knows New York is kind of as close to a freeway as you get. It's like a several lane, two or three lane highway effectively that runs around the island. So he gets us out of there and he's like, "All right, you go, it's yours now." And I take control. He's like, "All right, change lanes, do this, that." So he had me essentially doing kind of freeway driving in Manhattan, and I didn't know. Anyway, I almost got us killed and he was like, "What happened there?" "Dude, I don't know how to drive. That's what happened!" Anyway, somehow I survived that. Survived my crash in LA, as I moved out here. And so basically that was my first job.

Passions and PLF

Ben Procter   And then PLF, frankly was just, one of the guys that was working at the matte paint company said, "Hey, here's a few job listings I've seen." It was literally a random job listing kind of deal. And so I went in, I had no particular interest — not even interest, I should say knowledge of previs or what PLF did. Obviously I found it interesting once I got there. But at that point, my brain in terms of wanting to be in movies was much more about CG and visual effects and wanting to be a texture artist at a Pixar kind of a thing or whatever. It was much less live-action.

Chris Nichols   Where did that interest in CG come from?

Ben Procter   I think growing up in New York, I didn't know a whole lot about the industry, and I certainly didn't know people who were in the movie-making industry. I grew up around advertising, so I certainly knew a bit of what it's like to do a shoot and then edit it and go into sound mixing studios and all that. I sort of had some exposure to media, but not to movie-making per se. But I think I just became fascinated, particularly with the rise of Pixar. We got to remember like in the '90s and the early 2000s, was the explosion of the quality of rendering that Pixar was doing. I mean, I remember when *A Bug's Life* came out, I was blown away by the iridescence shaders and the beetle and all this kind of stuff. I mean, they were really innovating.

Ben Procter   And so between that and the *Final Fantasy* movie and other things that were happening, I think I just thought that high end CG animated stuff was super cool and I wanted to be involved in, or visual effects, just because it was the world creation, the wide digital matte shot. It was that, the design, world-creating aspect of kind of movie making, as opposed to the filmmaking, storytelling aspect. Anyway, the good news about being at PLF is that, by being forced into previs, I got a huge exposure to the live action side of things that I just had no idea about. And I'll give a lot of credit to Colin and the overall approach, I can't speak to what he's been up to lately, but at the time he sort of prided himself on being very technical about his approach, and very accurate to the kind of film equipment that you'd be using, and how you could sort of previsualize the limitations of that in order to figure out how you'd really do something.

Ben Procter   And I think being exposed to that and the kind of precision that he brought to the process as an architect, as you and Eric also bring to it, I think was great. A great discipline. I got some good habits from working for him at PLF, I think that have really helped me.

Chris Nichols   And he was historically a big Softimage guy, as were you.

Ben Procter   It's not even as was I, it's as am I, it's kind of pathetic, but I'm still running it.

Chris Nichols   You're still running it?

Ben Procter   Yeah, I'm still running it. The truth is, these days I don't do a whole lot of 3D, if I do anything artistic with the management stuff that I'm doing, it's more Photoshop, paint overs or whatever. Investing the time in doing 3D and set up and renders and all that, it's something that I used to do a lot and I still really enjoy, but I just don't have the time for it. So effectively, I'm just not a 3D user all that much right now at all, but yeah, I mean, to be totally honest, I downloaded the Cinema 4D demo last night to try to stay up and start messing around with it. I'm just the worst.

Chris Nichols   GRR Martin, he writes all the *Game of Thrones* stuff on a DOS computer with WordStar.

Ben Procter   Are you serious?

Chris Nichols   Yeah. Because he says, "It's never crashed on me."

Ben Procter   That's amazing, I wish I could say that about Softimage.

Chris Nichols   So Softimage, it's like to you is like, "Nope, I'm sticking with it." I mean, it's a great package and it is a shame. I think it got... What's the word?

Ben Procter   The shaft.

Chris Nichols   The shaft. It got deprecated in an unfair way, because you're right, it is a really good package. But unfortunately it was just too much for Autodesk to maintain everything. But I think it was really kind of interesting. I remember talking to you about some of the stuff you guys were doing there, and it was an eye opening to me as well because to me it was the one of the first times I got to really be in a visual effects facility and see how it was done. And seeing Colin who was also an ex-architect and seeing his perspective, so he kind of knew where I was coming from.

Chris Nichols   But you were showing me some of the stuff that you, I don't know if you had done, but it was at least on their reel, and it was figuring out how to shoot the plane crash sequence on *Fight Club*. And it was the previs, and it was all in Softimage, and you were showing how the crane would operate and the motion control, how everything would work, and I was like, "Oh." And it was like-

Ben Procter   This amazing stuff.

Chris Nichols   It was figuring out, it wasn't just about the CG, it was how to make the shot work. And you were saying, not only did this work, but this saved lots and lots of time

and energy for the director and the DP to figure out how the hell they're going to shoot this. It's all planned, just do it this way and it'll work. And it was the first time I started... And I'd barely, I was still working in architecture time, I was like, "Oh my God, this is figuring stuff out." And of course, it made sense because an architect would try to think of something like that. The CG guys would just want to focus on doing the CG and not worry about the other parts.

Ben Procter   Yeah, it's true. With an architecture background where it's all about the precision required to make things work in the real world, right down to millimeters and fastener choices and everything else. And engineered loads and tolerances and all the stuff that architects worry about, that's a good mindset for figuring out the actual brass tacks of getting something shot, precision is required. And CG, as I've discovered on *Avatar* and other situations obviously, CG is the ultimate playground of sloppiness if you want it to be. It just doesn't matter. You can make something interpenetrating with another thing, and in the final render in the shot if you don't see it, it just doesn't matter. And there's a truth to that, but at the same time it can kind of give people what I would call somewhat bad habits.

Chris Nichols It's true. I mean, I think I remember when I went to DD and I started working on *The Day After Tomorrow* and I had to build buildings, but I've been building buildings all the time. I was like, "Oh, right." It's like, "It's back there. Don't worry about it." I was like, "Oh yeah, I don't." So it was like architecture, I built everything to one eighth inch accuracy. And in CG is one pixel accuracy. It's off by a pixel. I was like, all right. And it is, you're right, it is sloppy. But there are a lot of other things that have become extreme minutia of thinking about details in CG as well.

Ben Procter   That's right. That's right. The detail comes in, in different ways. And of course the techniques of sub-D modeling and other of the softer, gooier aspects of CG modeling and rendering and that whole sensibility have made their way back into architecture.

Chris Nichols It's true. It's true. So somehow, from the world of previs and PLF you migrated, and I remember when this sort of happened, you migrated into the world of art direction and became an art director. And he's like, "Yep, I'm doing this. And I'm an art director now and I've joined the Guild." And you basically like, I'm done with that. I was like, that was fascinating. So explain that transition, how did that happen?

Ben Procter   So, look, I mean, again, I would say that I started as that kid or that young person in New York wanting to get into movies, I definitely had an eye toward the design aspect of things. I think I kind of didn't necessarily even realize the separation between design and execution in the film industry. It was kind of all one thing to me. So if I saw a shot of a cool spaceship in a movie, I thought, it was all of one cloth. Whereas in fact the truth is, there's a lot of different crafts that come together to enable that to happen. So the design, sort of DNA of it, was always in my brain, in my aspirations. But what was great about PLF was that it exposed me, number one to the physical truth of the fact that there are art departments

with cool talented people who are sitting there being paid to draw and design exclusively.

Ben Procter   So the experience of being on the *Matrix* sequels and being at the EON production place down in Venice and meeting George Hall and Simon Burton and these guys who were doing incredible work. I mean, in some cases it was digital, in some cases it was pencil, in some cases it was combination. Jeff Dale, all these guys. So getting to pal around with them a teeny bit as I had the courage to step outside the previs area, and actually make conversation with these guys, I was exposed to that and I thought it was amazing. And then also PLF gave me the opportunity to do small scale visual effects projects, where effectively there just wasn't the design input. It was off the scale, there was nothing to work from, and so you had to design on the fly and in many cases just make crap up with very little input.

Ben Procter   Some of these music video directors just literally would give you no input, not a little bit, none, you just had to make something up. But that was a great experience to be able to sort of think on your feet and design quickly and then execute that in CG quickly in a way that was somewhat efficient and all that. So I think at that point, I thoroughly set my sights on, I want to go into that world of art departments. But bring the CG skills and bring 3D skills, which was my main selling point at that point. I'm still not the greatest 2D illustrator in the world, but certainly at the time I was a stronger than average 3D illustrator. In fact, I was on the wave in such a way that I was probably one of the first that were kind of not just modeling and making awesome stuff in Rhino or whatever, but actually producing more rendered, well-lit looking images.

Ben Procter   So I just happened to be at the right place at the right time, learning those skills. And then I'll give a lot of credit to Ron Frankel who actually left PLF to make his own company, Proof, which is still around. And he gave me the chance to work essentially as a previs artist, but then transitioning into doing more rendered versions of the things I was working on. And then that was on *The Terminal*, Spielberg movie with Alex McDowell, production designer. And that gave me the chance to get into the union as an illustrator, which is what I was for a long time. Before I ever art directed in film, I was an illustrator for many years. So that's where I made that jump. And from there on, once you've paid your union dues of thousands of dollars, you want to make the best of it, stick with it. So I stuck with it.

Chris Nichols   Right. Well, that's interesting. I didn't know you worked with Alex McDowell as well. He's been on as well.

Ben Procter   I'll definitely have to listen to that one.

Chris Nichols   Yeah, he's interesting. He toured with the Sex Pistols for a while, so I don't know.

Ben Procter   Did he?

Chris Nichols   Yeah.

Ben Procter   Actually, yeah, some of their graphic work was some of his earliest work. Early paste-up poster type stuff.

"Transformers" and "Tron"

Chris Nichols   Yeah, yeah, he's a very interesting person. But anyway, so that sort of ended up getting you into that art director's world, and I think you worked on, you said the *Transformers* stuff, right?

Ben Procter   I did.

Chris Nichols   I remember seeing the early *Transformer* designs. And it was one of the first times, honestly, that I was so used to seeing... As at that point I was working in visual effects and I was so used to seeing basically traditional drawing concept art for so long and saying, here it is, here's a sketch or whatever, make this. And I was like, hmm, okay. And it's just challenging, you have to make it from nothing, and you have to figure it out. But it wasn't until I was on *Tron* that basically I got there and you guys were next to us, right next to us. And so you were like, "Here's a model. You can use this at least as a base of something."

Chris Nichols   And it was like, wow, it was the first time you could see something in three dimensions and work with it in three dimensions. That was concept. And I remember talking to you on *Tron*, I was like, "This is changing everything. This is making my life so much easier." And not only that, I think it was between Digital Domain and you, David Levy ended up sitting right next to me on the light bike.

Ben Procter   He stayed on, right?

Chris Nichols   He did. And so he and I worked together on the light bike sequence. So he's like, "Hmm, that's not going to look right. Let me design a new light or let me design a new floor." And he would redesign it and we would see it in the final shot, his design, the next day.

Ben Procter   Unbelievable.

Chris Nichols   And I know that sounds like, okay, that's great. It was like, it used to be like two years between the illustration and the shot. We were doing it in a matter of a day. And I mean, creatively, that's just such a better workflow. So much better.

Ben Procter   It's amazing, yeah. Well, what typically happened in the old days, and I've been on both ends of this, is that there was just this information chasm between the production and the art department that was catering to the production, and then post. There was a time gap, there was a personnel gap, production designers were not held on for long enough to help handhold that transition well enough. And it's probably not out of any lack of interest from the designers, it was more just kind of the culture that, I don't know that the production side saw the benefit to paying some expensive person to stay on, to be involved in posts which just didn't even make sense to them. But as we know, as movies have gotten more digital and as there's scarcely a pixel of a shot that doesn't somehow integrate live action and virtual and have set extension and everything else, these kinds of crossovers are super important. I give a lot of credit to Darren Gilford who's a terrific production designer and Joe Kosinski, I know Joe had been at DD doing the test piece with you guys before. Were you involved in the teaser, the test?

Chris Nichols   I was not involved in the teaser.

Ben Procter   Okay. But I mean, huge credit to him as a guy who, again, another architect. Somebody who's into computer graphics for their own sake and is kind of a geek about it, seeing the benefit of really embracing digital filmmaking and digital look-dev and all that stuff that you guys did so well in that teaser that we just kind of had to follow it in the movie, to an extent anyway. Anyway, a lot of credit to them, but they set up, I would say a really, really smart deal, that we had a big art department that was digitally savvy, I think from day one. I mean, Darren himself as an example, 3D modeled the giant Rectifier ship himself in Sketchup. He modeled it himself. And the city, we changed it and we improved it and we developed it more, but he modeled that city in Sketchup himself..

Chris Nichols   But back then that was like a big deal. And I remember my friend Christie, she's an art director as well. So actually she worked on... No, she did not work on *Avatar*. Stefan worked. He was on the art department of...

Ben Procter   Stefan Dechant.

Chris Nichols   Yeah. So his wife, I went to architecture school with her.

Ben Procter   Oh, cool.

Chris Nichols   Yeah. And so she was an art director and she was telling me she would come from architecture school and went to become an art director. And then they were like, she went to use a CAD program to sort of design how the building was going to build on set. And they were like, "No, it had to be drafted by hand." I'm like, I mean, computers have been around for a long time. So it seems like it was an uphill battle to get digital into art departments in some ways.

Ben Procter   I think that's true. And I also think that something has been lost in the fact that digital won. I sort of, again, see that from both sides too. Anybody who's worked alongside pencil draftspeople in an art department knows that there's... I mean, partly it's a generational knowledge base that people who came up at that time had, and this is no denigration whatsoever to the 3D set designers that I work with constantly, and are my companions and amazing and whatever, so I don't mean it that way. But there's a knowledge of just basic construction of the set of how this will really get put together in a kind of a slightly more hands on way because of the experience that people had. Even if they weren't art directors, dealing with the foreman on set of how you are going to actually put the nails in the wood and make it happen.

Ben Procter   Like for example, you went to architecture school, but I don't know and I have not. I don't know how much you guys study traditional cornice moldings and decorations, the kinds of things you often need for movies that are so not popular in real architecture. I don't know how much that's studied anymore. But people in movies of that older generation of pencil pushers, they knew that stuff. They came up with it.

Chris Nichols   Well, it's interesting you say that because there were certain things that were lost just when I was going into architecture school. And it was similar. For example, we did learn about all the... Because we knew that architecture was based on art history, so in order for you to do what you do now you have to learn how you got here. So that was like a journey you had to take in terms of style. But in terms of skill sets, I was the first class in architecture school that did not have to learn how to letter. So lettering is something that architects in architecture school literally would learn how to write. It was like a calligraphy class you had to take every morning.

Ben Procter   In a specific style, it was very clear.

Chris Nichols   And didn't have to do it because I said, you're probably never going to have to hand draft ever, because at this point CAD is going to take over. They already knew that. And so CAD was still the new thing. I was still drafting by hand because honestly it was fun, but I was doing CAD as well. I was the digital guy at architecture school, but we did not have to learn how to letter. And so that was like a moment, like, you're never going to have to letter again.

Ben Procter   Yeah, it's a turning point.

Chris Nichols   And if you look at old architects and you look at how they write a check, it's beautifully written.

Ben Procter   It's beautiful, I know. Handwriting definitely has been lost in our culture in general.

Chris Nichols   Yeah, exactly. So you're right, there are certain skills that are gone from that process.

Ben Procter   And also just to give another example, let's say you are working on a medieval castle or a Gothic piece of architecture, whatever it is, there's a shorthand way to represent all that decorative detail, whether it's a sculptural figure that's holding up a bracket or whatever it is. There's a shorthanded way of sketching that in a 2D world, that you can imagine doesn't translate to the 3D world. Now suddenly, you're expecting your 3D set designer to what? To know ZBrush and to pose a cherub in a specific beautiful pose? No, they're either not going to do it or they're going to do kind of like the ham-fisted version of it in 3D. Because they are a pain in the ass in 3D. But someone traditionally could just note that down, and then a sculptor who's equally trained in all the details of what that cherub should look like because of their training, would jump in and take it over and push it.

Ben Procter   So I guess what I'm saying in a long winded way, is that in the more traditional world, number one, I love the fact that the digital world and everything empowers one person to do so much stuff. That's kind of what digital technology does, is it super empowers the individual. But there was something about the old ways that worked in the sense that each person knew what they needed to know and convey just enough information to the next skilled person that they can then finish it, as opposed to the explicitness and the detail level of a digital world where it almost demands that everything be really figured out all at once. You know what I mean?

Chris Nichols   Yeah. You're right. The shorthand is the thing, there's a way to just like, I get it, it's a boat, it's a car, whatever. And you can do that in three brush strokes.

Ben Procter   Exactly, exactly.

Chris Nichols   And then otherwise it's like, no, you got to go to TurboSquid, download a boat, find out, is it going to work. You just made it a lot more complicated. Yeah, it's true, I never thought about it that way, but that's great.

Ben Procter   But that being said, I mean, look, I'm the first one to love the total anal retentive control that you have now to work with a super talented person in SolidWorks, for example, and make the model absolutely perfect. And then you work with either that person or somebody else in Keyshot and with Photoshop painting or whatever, to just tease something into looking exactly the way you want it to look, all within the art department, all in the digital world. I love that level of control too, so I can see it from both sides.

Chris Nichols   Yeah, yeah. But you continue to use that kind of workflow that was working much closer with the post world. You always had that mentality of like, I'm doing it in previs, but I know that what I'm doing... Sorry, in pre-production. But I know that

everything I'm doing in pre-production is going to help people in post production make that gap.

Ben Procter   Absolutely. To finish the point about Joe Kosinski and Darren, and the way they set things up on *Tron*, so at a certain point in time when the main art department went to the production location in Vancouver, the people that you saw DD, we split off and formed that kind of splinter visual effects-facing art department. And I think having a dedicated visual effects art department effective as we were, that had had the cultural experience of being within the production but now we're literally co-located with the visual effects artists, that was an amazing, smart move. I think you benefited from it, I think we did too. Because it was the ultimate zero communication gap, because we're sitting next to one another and every time we handed something off, we could have an in-person meeting about it. Like, "Oh, here's this new model." And someone would ask a question, some visual effects person would say, "Well, why is that piece missing back there?" And be like, "Oh yeah, I didn't think to point that out. You're right, we owe you another piece back there." It's an amazing process.

Chris Nichols Or even if you had a spaceship that you designed, the rigging department goes like, "How's this supposed to work?"

Ben Procter   That's exactly right. They may say like, "Can we trim off this little corner to enable this piece to not collide with something else as it pivots?" And you can just in one fell swoop just, "Oh, I apologize. Absolutely, yes, go for it." And then there's no rendering versions and worrying about it in that ship.

"Ender's Game" and "Avatar 2"

Chris Nichols Yeah, it was really, really beneficial. And you guys continue to do that, obviously that exercise continued when you guys worked on *Ender's Game* too. So you guys were both... Did you work on *Ender's Game*?

Ben Procter   Yeah. So I co-production-designed on *Ender's Game* with Sean Haworth, who's a terrific guy. And so that was unusual in that it was, at the time, a DD production. DD was one of the producing entities and put money into it and everything else. So we were at DD in pre-pro, which is obviously super unusual. And Gavin, the director, was there and we were all trying to work up this pitch package to attract other investors basically and other partners. And eventually when that went, we went off to New Orleans and shot down there. But we were at DD at the beginning, and I think we were at DD at the end, but not as much as we were on *Tron*. I mean, *Tron* was quite well budgeted, *Ender's Game* cost some money to

make, but it wasn't the same thing. So we kind of remotely were doing post contributions from home kind of thing.

Ben Procter   But for sure, I mean, it was the same process in the sense that I think, as somebody who's been exposed to a lot of aspects of... I mean, there's so much about filmmaking that I don't know and will never know and it's kind of sad. But anyway, I've at least been exposed to a lot of the kind of the handshakes and the way that information is shared between different parts of production, on the digital side especially. I've made it my process, or my mission to kind of in whatever I'm doing, to really try to help that sharing. You know what I mean? So as a production designer, I take that seriously, but even when I was an illustrator, I almost looked at it as a privilege to be able to communicate directly with the visual effects team, the people who are doing the final modeling on the robots on *Transformers*, or whoever it was I was working with, to have a personal direct relationship with those people, to save out the models in the most careful way possible so that it's clear and it doesn't break and make sure that they imported properly. To communicate all that intent to make people's lives easier down the other end.

Ben Procter   And it's a privilege in the sense that, in that way we're able to control the outcome also. You know what I mean? So as a production designer I try to take pride in the ability to save things out properly, share the information and do video conferences. And I'll say that the process in *Avatar* has been awesome with Weta Digital. Everything we hand off, we do our best to package the 3D and package the refs that go with it, but they have a process of making these ref package PDFs where they kind of boil it all together into something and bring their own reference, and Michael Smail is a guy who works there who's doing a great job, they bring their own reference to bear and put it all into one package of like, "Here's all the information, do you approve it? Are we ready to go?" And it's like, "No, change this reference for that reference." So no modeler or texture artists or whatever, is starting on it prematurely before you've really communicated everything. It's really smart.

Chris Nichols   Okay. I mean, obviously that's working pretty well. So that communication-

Ben Procter   So far it's great.

Chris Nichols   With visual effects. Obviously that has a lot to do with the fact that you, I mean, you came from the visual effects world or you understood the digital effects world. So do you find that there are more people like you that have a background in CG or in visual effects that are in the art departments now, that that communication is becoming easier and better?

Ben Procter   I think at this point, I mean, certainly on *Avatar* where we had the pick of the litter, so to speak, in terms of hiring. And we specifically chose people who were a little more digitally savvy, a little more 3D oriented, yeah, I mean, the name of the game these days is, as an illustrator designer is to just be kind of flexible and to know a

lot of different techniques. So you can imagine the skill sets that were brought to bear were pretty mighty indeed. We've had, can't say enough good about the people in our art department and the process of co-designing with Dylan Cole under Jim on this amazing thing. But basically, yeah, I mean, to make a long story short, I would say that everybody has some kind of 3D skills, and I think take a genuine interest in pushing the technological levels of what design and illustration are.

Ben Procter   I mean, every time I turned around, somebody had learned how to sculpt in VR and we're doing amazing stuff. And then before I know it, three guys in the same room are all wearing VR goggles at the same time, and they're all in Gravity Sketch, not messing around but doing fundamental hard design problem solving using VR. And nobody told them to do that. They just kind of did it. So that's the great thing about the openness and freedom of the art department world where you don't have to... I mean, it's a disadvantage in the certain sense that it's kind of the Wild West and it's chaotic, nobody uses the same package, file transfer is always a pain in the ass, this and that and the other, but it's the Wild West in a good way and it's kind of an incubator for people to just screw around and come up with new techniques, because it doesn't matter, there's no pipeline.

Ben Procter   The only pipeline is cool pictures and decent 3D going out the door. But everyone got into the GPU rendering thing, everybody started getting these... Suddenly computers went from, in the old days of a $6,000 computer, somehow it got down to $2000 and now it's gone back up to $15,000.

Chris Nichols   Yeah, because of the GPU cost.

Ben Procter   Massive racks of GPUs.

Chris Nichols   Yeah. But that's interesting because, like you said, I remember I'd visit you at one point and we were talking to a bunch of freelancers or people that were working on *Avatar*, and everyone had their own computer. So it was their only system because that's, you hire me, and this is my drawing pads, basically, it's a computer. And they would buy these expensive computers, there was no pipeline, it was whatever you did as a library of stuff that I have. Who was it? I kind of forgot. Anyway, he just basically is like, "Here's all my stuff and then when I've got to do something, I can just kitbash from this, or I have this." And it was like a process in his own scripts.

Ben Procter   Yeah, it might've been Fausto.

Chris Nichols   It was Fausto.

Ben Procter   Fausto is MVP number one on my tech design side on *Avatar*. He's been with us for some of the years and he's still with us now.

Chris Nichols   Right. But it was that kind of, okay, so there's no pipeline, but it's-

Ben Procter   It's like a personal pipeline.

Chris Nichols   Personal pipeline. And so that was like, oh, that's interesting. And so when I was talking to some of those guys and helping them out with some other stuff, I was like, "Oh yeah, I need a specific tool for my pipeline or what I'm doing." But what's also interesting is that somehow you are also kind of integrating yourself into the visual effects process, which has a much more rigorous pipeline. So that handoff, is there a way that you found, it's like, okay, no matter what, we can do all this crazy stuff on our own, but at some time you got to go, pru, to something that's digestible to the process.

Ben Procter   The main thing is just to test it out, so that same guy Michael Smail, we asked him early on to make us a table of the different file formats that they wanted, and that included things like, if somebody's native Max or native Cinema 4D or whatever it is, do you want that scene file as well, just so you have the raw thing? One day somebody gets hit by a bus, and you would at least have the real thing with the original material pathing and all that stuff. So what we have is a table that he made, that tells us which formats to save things out in it. So everything goes out in Alembic and FBX and LBJ and some of the basics, but then you've got native, if something was done in CAD, you've got a native Rhino or a native SolidWorks or native whatever it is, along with it.

Ben Procter   So they're kind of, as fully equipped as they can be. And they're within their rights to come back to us and say, "This is corrupt. We can't open it or whatever." But by basically sending it out in so many flavors to begin with, we ensure that that doesn't happen. And it hasn't happened at once.

Chris Nichols   Yeah, yeah, absolutely. But I think what was interesting to me as well, especially when I was on *Tron*, I was looking at stuff, one of the biggest reasons why you guys have to have your own personal little process that you do your things, is the turnaround is so fast. You just got to come up with an idea and build it, texture it, project it, put it together with bubble gum and duct tape, whatever it takes, and have it rendered in almost real time to put it in front of someone's ideas, like, yeah, that's it. So the iterative process of the design is what's very interesting. So how has that technology changed over time to make that process much faster for you?

Ben Procter   I mean, just to use Fausto as a great example of somebody who has a very developed personal pipeline, I think the thirst, and this is again, part of the cultural transition to digital in art departments and in productions in general, it's not just been about going from traditional set design to digital CAD, but obviously there's an expectation now, the Photoshop illustration revolution and then the 3D feeding into that. There's an expectation that things should look pretty finished and pretty real. And I'm sure that's true of architecture clients in the real world now too. That nobody basically knows how to read a plan anymore, people want data, it's the show me state. Everybody wants to see what it's really going to be

like, or they don't know what you're talking about. It used to be that people knew what a sketch was and now they don't apparently. I think there's something lost there.

Ben Procter   I mean, and I'll give a shout out to Jim Cameron, who because he's an artist and can just sit down and draw really well. He can engage in critiquing a design, I think, in any level of presentation. You could draw something with a pencil and he'll understand what you mean. You could do the most finished render in the world, and he'll get into that too. He will not be swayed into liking something just because it's well rendered at all. He will happily reject some of the most amazing art ever because something is just conceptually off about it or whatever that is. So there are people who I think can see through the code of the matrix, and can understand a design intent from any media or from any presentation. But that's not the norm.

Ben Procter   I mean, I think in general, and it's not really a criticism exactly, but it is a shame on some level. Just that we are now all forced to operate at this kind of photoreal level all the time, from presentation number one. And I don't think that's necessarily as true in games, I don't know why I'm saying that, I guess I'm just thinking of the amount of game artists I see online that have a more drawn style. That's just awesome. I mean, I love looking at art that's not as literal as the stuff that we have to do, but we're in that world. And so I guess when you look at Fausto, he's got systems in place for working quickly where the system incorporates the look-dev, so to speak. So he's got terrific metal shaders with edge wear and all this stuff built into them.

Ben Procter   He doesn't have time to UV stuff and take it into Substance and paint it up, whatever. He literally just doesn't have time. So he can use his kit and use his shader setups that are really richly developed, and they're very well organized, by the way. I mean, you probably saw.

Chris Nichols   Yeah, I saw it. I saw it.

Ben Procter   All his kitbashed parts are all in different categories and he's got it all visually browsable and it's amazing. And I know I'm focusing on Fausto, but if anyone else is listening, I love all the rest of the art department. But anyway, what that allows them to do is essentially throw stuff together, throw some design, spit on top of it and come up with a composition, and then it's essentially within 20 minutes he can have some shaders chucked onto it and have a presentable by modern standards image. So that's what I'm talking about.

Chris Nichols   And it was really surprising to me because I would look at the image, and that's the thing that's also very, it was almost hilarious to me because I was like, wow, that's a great image. I get it, totally get it. And then you'd hand me the file I'm like, "This is a mess." But it looks so good. I'm like, okay, I get it. That's how they got it done so fast; I would have worked to make it finished.

Ben Procter   That's right.

Chris Nichols   And then I realized, I'm probably spending hours to finish it when I really just needed to get to that point and then render it and then little Photoshop on top, and you're done. And it was like, oh, I get it now. And it was one of those things I was like, right, now I understand how you guys are doing it so fast because it is, especially in what you guys are doing, it's the idea of getting an idea out. It's not about the execution. It's like you get the idea? Yes I do. Okay, you can take it over from here. But I expressed that idea and I got it out as fast as possible. It's a really kind of a different mindset to think about.

Ben Procter   Well, and don't forget it, within the art department there are people who are much more nitty gritty in the same sense that some visual effects artists will have to take a rough model and turn it into something that has right topology and good reviews and everything else before you can put it into the movie. There's CAD modelers and set designers, pardon me, who have to do all that same stuff too, in some ways and even higher tolerance level, in order to manufacture things. Imagine the amount of work that it takes to get that down to 3D-millable geometry that is going to be water tight when you stick it back together and all that kind of stuff.

Ben Procter   So I guess for me, the pleasure of being a production designer and kind of working across the whole department and seeing all these different processes and seeing things go to the digital side and go to the practical side, because there's a lot of pleasures to really building stuff too, is I think just getting to see the different temperaments that people have, creatively and kind of technically and how they each bring something to the process that's unique and how you kind of need all of them. It's kind of what I was talking about a little bit with the example of the traditional set designer handing off a rough something to a sculptor who then knows what to do and kind of runs with it. It's not that way anymore exactly, although those things still go on. But in the digital realm even, you have a sort of a baton passing process that happens where each person adds their own expertise to it. And that gets right down to...

Ben Procter   I mean, I'll give an example as far as I know, a unique example, but probably will become more and more common. Our painter in New Zealand on *Avatar*, Alastair Maher, is both a traditional paint supervisor and worked at Weta Digital as a lookdev texture guy for many years. So he literally talks both languages. I can sit there with him critiquing something and to one of his crew, then I'll be like, "Dude, it just needs more breakup in the SpecMap," or some kind of typical CG shorthand thing, and he can then literally translate as if it's a language too, but let's try this glaze applied with a sponge or whatever the hell the actual real world equivalent is, which is great.

Chris Nichols   That's interesting.

Ben Procter   But you have all those physical crafts where people are adding to the process and having to do interpretation and everything else too, down the pipe. Anyway, it's funny that everyone has their own temperament, everyone has their own pace. If you look at a person individually, you're sort of like, oh God, this guy's slower. That guy's faster. This guy gets impatient. And I'm saying guy, gender generic, don't think that I'm only talking about men. But what's cool is that when you really look at the end of the day what everyone's contributed in the way they've shared files and the way that they've built one thing on top of the other, if you as the production designer are doing your job of making sure that at each transition, each hand off, it's getting better and not worse, then it's incredible what everybody contributes to it.

Ben Procter   And you can only get to a super high level of product at the end of the day through the efforts of all these different types of people. So it's just fun. Again, that's that Wild West thing. It's not like there's some regulation in the union that we need a certain bunch of personality types like this and a certain number like that, it just happens automatically that in the community of people who are attracted to design and visuals, you get all kinds and they all serve their purpose. I'm sure that's even true in visual effects facilities, that you have your specialists-

Chris Nichols   Of course.

Ben Procter   Who are really good at this one thing.

Chris Nichols   What is interesting though in the individual effects world and what's becoming more popular, and I don't think anyone really suspected it is, that generalists are coming back. Because generalists seem to like it, it's kind of like a Fausto situation, don't worry, I'll take care of it. They have enough stuff that they can make it happen. They don't have to go through a million pipeline process. And the generalists are becoming popular as these MacGyvers who can go in and take care of things. And I think that's an interesting idea as well.

Ben Procter   I think a generalist, and at least to use Fausto as an example, a generalist is someone who's impatient enough to want to get the thing done and not let the process get in the way. And so as someone with that mentality or that temperament, you're going to develop tricks and you're going to develop shortcuts that work well enough, and you're going to develop it among the different crafts that digitally kind of add up to a finished product. And so it's kind of a level of kind of urgency and impatience that is very useful, but you need the other people too. You need the finishers, you need the people who can meticulously make something perfect too. It's just you need to use the right gear for the right task. You know what I mean?

The future of the art department

Chris Nichols Yeah, absolutely. So I want to ask you, I know you can't really talk too much about things that are currently in production, but I'd like to know what you think, how the role of the art department has changed, or do you think it will change, where it's going to go, where virtual production is becoming a bigger part of the process, and how art departments are now sort of involved in that. What's that like, and how's that going to change things?

Ben Procter Yeah, well, it's a pretty amazing opportunity I think, for art people to get their hands dirty again, so to speak. And when I say again, it's a little bit because it's a return to the old days in a certain sense, that there was a lot more. There was a time back in the day, the studio system in Los Angeles where you'd be an art director for the studio, you'd walk around a lot and you'd supervise the construction of 10 different sets for four different movies at the same time, et cetera, et cetera. And there was a kind of a crafty hands-on kind of quality to how you'd get that done. And I think that also just in traditional filmmaking, there was a level of commitment you had to make that you just didn't have digital effects to fix everything later.

Ben Procter You had to come up with really clever physical tricks of using mirrors or using whatever the hell for grand miniatures, all the great stuff that we look back on and revere, all had to be done because it just had to be in camera. It just had to get done that way. And so I think I'm excited by virtual production in the sense that it brings some of that kind of hands on craftiness that you need to have. And also the commitment to like, we just rolled on that shot, and the LED screen was displaying, it was displaying it. Guess what, it's done. There's no going back. I think there's different types of virtual production, certainly on *Avatar* we're striving for the absolute pinnacle of every aspect of what it takes to make a convincing performance and 3D image and everything else.

Ben Procter So we're using technology in this kind of open ended way where you kind of always keep the balls in the air all the time. You always have options. You can always come up with a new virtual camera and all that. And that's kind of what it takes to finesse things to the level that Jim wants, but I do think there's something cool about, it's a little more old school, that with virtual production in *Mandalorian*, it's like, "Nope, sorry we shot it, it's done. So I think that's cool. And I can't talk specifics."

Chris Nichols You can't talk specifics, but-

Ben Procter   But even about *Mandalorian*, I know a cool *Mandalorian* anecdote that I shouldn't know about. It's like double that I'm not supposed to talk about, it's not even my show.

Chris Nichols But you are making things, you are making things basically that are going into shots. And they're being shot in live or real time, right?

Ben Procter   Absolutely, enormous construction on *Avatar*. You wouldn't think so, you would think that the lessons of the first movie into how much time we spent in the natural world of Pandora, and how much we intercut between live action sets and that, and it's sort of never jarred people really, I think it worked really well. You think like, okay, well we now believe in the visual effects tech, rendering hard surface stuff. Any visual effects artists will tell you that rendering hard surface stuff and shading it, whatever, it's just a lot easier than complex organics. Right before they tell you that it's too expensive to do such and such thing digitally and you need to build it, because it's really hard to do. So they'll say those things.

Ben Procter   But anyway, the truth is that Jim, I think just feels that he needs the live action, or that it's beneficial to the live action to anchor the film, to help the audience believe that it's all real. That's the reason we have live actors too, portraying humans, and it lays down a foundation. Number one, so the visual effects has something to live up to. Number two, so that your brain just kind of accepts the reality and will forgive the visual effects in the rare occasion that they fall down. And I think he just kind of likes it truthfully. I mean, he's a filmmaker, he likes having real sets and real actors and just doing some of that stuff too. So we've built a lot more than I would have expected.

Chris Nichols That is interesting. And I also think it's interesting, the other thing and you hinted at it just earlier, it's like, you are not delaying the decision making. You have to make a decision now because it's going to be done.

Ben Procter   It's going to be done, that's right.

Chris Nichols Then you say, we'll just put a green screen back there and then you will figure it out later. It just delaying having to make a decision right there.

Ben Procter   Yeah. Also we have Simulcam. So I mean, we're a thoroughly virtual production both in the sense that we do full blown... I mean, I guess there's debate, I've heard you even debating on one of your podcasts about, what does virtual production, what does that term mean? Obviously it can mean different things. And so in the *Avatar* sense, on the one hand it means the full blown performance capture process, where you stage every damn bit of the action that you need, even if it's background, even if it's porous as being written, even if it's whatever you, you don't animate it if you can possibly help it. You stage all that stuff with virtual, not virtual, sorry, proxy sets, gray sets, and everybody kind of knows what that looks like. That being said, you will be amazed at the size and complexity of some of

the gray sets that we built on the sequels, major expensive engineered steel, big stuff, pretty crazy stuff. I think I lost the thread of what I was going to say. What was I going to say? Oh, I'm sorry, Simulcam.

Chris Nichols   Simulcam, yeah.

Ben Procter   So at the same time, we're taking full advantage of the fact that we have this virtual camera capture system. So there's lots of live action sets that we built that Jim encountered for the first time, so to speak, as a filmmaker by scouting them virtually. So on *Avatar* we've got the art department, then we've got what is sometimes called a virtual art department, which we call the lab, or the environments team within the lab is really more accurately what it is. And so we hand off things to them, long in advance of worrying about handing off the model to visual effects, we're handing it off to the lab, which has its first chance to get ingested into the whole system.

Ben Procter   So they make it into a real time, lighter version, in some cases they've made gorgeous realtime assets that are up to the level of good game assets almost. And so the virtual between what they've done and the Gazebo real time renderer that we use, which is a proprietary, Weta Digital thing, some of our virtual looks good. I mean, it's pretty amazing. But basically, so Jim has already encountered a lot of these sets virtually before he ever, ever saw them in person. So what that allows us to do in some cases, we've never done this perfectly, but in a perfect world you would literally have him scout it and then debate with him what the extent of physical build would be standing out there in the volume. Like, okay Jim, here's our proposed, y'know, alright, switch the visibility, show the extent of the build and have them experience that out in the volume.

Ben Procter   We never actually did that, we were fully prepared to, but just didn't have the time. But effectively, we've designed these environments as full virtual worlds first, then you debate endlessly including debates with visual effects and debates with your own budget and everything else, what are we going to build, what do we need to build, what can we afford to build, et cetera. And then later on, the part that's not what you built, that comes the Simulcam package, so to speak, for what's running virtually in his tracked camera on the day. So a lot of effort actually, like for getting ready for a live action day on *Avatar*, has been, not just making sure the physical set is ready, which is of course the priority, but making sure the Simulcam is right. Because sometimes he's got stuff that he needs to be framing for that's totally critical to either the architectural composition of something or characters, more importantly, obviously characters walking through, et cetera. That's got to be sussed out really nicely or else he's framing the wrong thing. So it's virtual even on the days when we're shooting live action big time.

Chris Nichols   That's interesting. I find that virtual sets are going to become much more important. Things have to be more real time. And so I think what virtual production is going to do, it's going to bring back some of those sensibilities of traditional filmmaking, right?

Ben Procter   I think so.

Chris Nichols   So you're not going to be stuck in this thing where it's just wait and wait and go in a process and process, and have one version a day. Because that's the way the visual effects world is. No, you're going to have a hundred versions in a day because you need to get it right then and there. There's time and money spent on sets, and now suddenly that has to be a process that's going to be very interesting. So I think the roles of art departments are going to become very, very interesting and people that work in art departments are going to have to be savvy enough to be like, yeah, no, build it. It's like you're building the thing, you're the designer and the carpenter at the same time.

Ben Procter   Well, exactly. I mean, someone in that position has to say simultaneously, walk over to a set painter and be like, "You need to weather this down with some kind of rusty oily composition in this corner," whatever it is. And then walk over to an Unreal artist and say, you need to, again, like I said before, "You getting any more breakup in the SpecMap?" You've got to be talking both languages all of a sudden. I think that's cool. And I would say that a lot of more modern art department people, I think are pretty well equipped to do that.

Chris Nichols   Right, right. Well, I'm glad we were finally able to do this podcast, we're just over an hour. And as we mentioned before, we are going to do another podcast once *Avatar* comes out so we can talk more details about that.

Ben Procter   Yes.

Chris Nichols   Which is going to be very exciting. But it's cool that we finally did this. It's interesting now that I'm doing these remotely, I'm actually getting a lot more people. They're like, "Oh yeah, I guess, I'm stuck at home. I can do a podcast."

Ben Procter   Yeah, yeah, perfect opportunity. Well, thank you for pursuing me for such a long time. I'm sorry that I've probably flaked out a little bit here and there in terms of how I respond.

Chris Nichols   That's all right.

Ben Procter   But I'm very happy to do it and I will have endless things to talk about *Avatar* and more, in so much more detail later on.

Chris Nichols   Yeah, it's been your life for seven years.

Ben Procter   It has been, yeah. And who knows when it's going to end.

Chris Nichols   All right. Well, thank you so much, Ben. I appreciate it.

Ben Procter   Awesome. Well, great, it's been really fun. Thank you so much.