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COVER STORY

'Coraline' Animated Via Stop-Motion

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PORTLAND, OR — Stop-motion animation is not about computers. It's a time-honored and time-consuming process that demands exquisite artistry, infinite precision and anal retention. Think Willis O'Brien on *King Kong* (1933); Ray Harryhausen's classics; Tim Burton's ongoing fascination; and Henry Selick.

In this computer-free medium, we have not seen a full-length American-made stop-motion feature since Selick's one-two punch of *The Nightmare before Christmas* (1993) and 1996's *James and the Giant Peach*, and Peach had live-action sequences. (Burton made the fairly recent *Corpse Bride* in England, also home to *Wallace, Gromit* and *Nick Park*.)

Now that's changed. Henry Selick is back with a full-length film, and he did it his way, yet he embraced computer technology in new ways too.

In *Coraline*, the characters' replacement heads are molded in a computer-controlled 3D printer that allows for precise gradations and nuances of expression. Mouths have teeth in them and tongues, and more. Eyes and eyebrows are more expressive, too.

Sculptors did their jobs — and some sculptorly imperfections are preserved for old time's sake — but their *Coraline* models were scanned in 3D into the computer and then modeled and "printed" on three-dimensional printers made by Objet Geometries.

The flow of movement in facial expression was also gauged in the computer — using Autodesk Maya software — and the expressions we see in *Coraline* have been precisely directed by

the keen eye of Selick in previs and during the shoot.

For impact beyond the subtleties of facial expression, the whole thing was shot in stereo for 3D release by RealD. *Coraline's* DP was Pete Kozachik, ASC, who shot on a digital still camera that was repositioned for each frame for the audience's other eye.

The whole effort seems to rewrite and update the traditional stop-motion production experience. Computers also erased rigs used to support the characters and erased the faint line that exists in a replacement head where the head's lower half (which includes the mouth) meets the character's upper head.

There's also in general a greater fluidity in movement in *Coraline* (thanks in part to the film's 24fps) though Selick and company took

pains to imbue shots with just a little of the stop-motion jitters of yesteryear.

Working at Laika, an animation studio here (www.laika.com), Brian McLean, facial structure supervisor, and Martin Meunier, facial animation designer, had the job of introducing new technology — particularly the Objet 3D printers — to the time-honored stop-motion process.

SMALL FACES

The more faces you have fabricated, the more expressions you can make and the more subtlety you have as an expression changes. It's not just smile or frown; it's what's in between. Brian McLean has been working in stop-motion for going on three years — all of that on *Coraline*.



Prior to that he was a sculptor/model-maker/prototyper for toy companies who had moved on to work at industrial design school California College of the Arts in San Francisco. In 2005, while McLean was running the model shop at CCA, the school purchased a 3D printer. "I very quickly adapted to it and realized it was going to change the way we were making models and prototypes." McLean says.

McLean soon invited over to CCA an old friend — Martin Meunier, who had been working on earlier Selick films — to look at this printer, manufactured by Objet. Meunier and Selick had considered the possibility of exploiting "rapid prototyping" using 3D printing in the past but never got into it. This time, when Meunier reintroduced the concept of rapidly creating multiple replacement heads for stop-motion characters in a 3D printer, Selick decided the time was right.

Meunier, like McLean, is a classically trained sculptor, but Meunier also has many years of both stop-motion and CG experience in filmmaking. That was useful, McLean says: "This whole [*Coraline*] process is really a blend of both because you're not just modeling in the computer — you have to keep in mind how these things are going to function and hold up in real space."

Back on *Nightmare*, the lead character, Jack Skellington, had around 800 different sculpted facial expressions. Meunier has worked for Selick, off and on, for years at a time on films, including almost a year on sequences for Wes Anderson's *The Life Aquatic* (2004) on which Meunier was Selick's creature supervisor.

Besides the obvious tactile qualities of sculpted characters, Meunier loves another aspect of stop-motion. "The thing with stop-motion is we don't have to recreate the architecture of light," he says. "We have it!"

Meunier feels that successful films like the all-CG *Toy Story* caused a popular shift away from stop-motion. CG characters could — and did — do anything a script called for; they seemed more expressive; their environments looked more real and they also benefitted from the CG world's ultimate mastery of that important "architecture of light."

Meunier allows that there's been a CG takeover, "but the goal of this movie was to take that back, using the tools that CG used to dethrone stop-motion. The amount of expression we can get on our characters is equal to the expression a CG character gets." But stop-motion uses real characters with real shapes and it's bound by the



rules of reality and that gives it an "anatomical advantage." In a CG movie, use of extreme deformation actually takes away from the story's believability, he says.

EXPRESSIONS

As opposed to Jack Skellington, the movie's star Coraline, voiced by Dakota Fanning, has over 205,000 different possible expressions. Abrupt changes in expression could now be eclipsed by subtle expressions via "smooth animation with a little bit of settle-in at the end," McLean says. "We can literally go in and have scene-specific expressions. We had a library with thousands and thousands of faces. We also had that library in digital form. This means that an animator can sit at a computer with a facial-animation specialist and go through and help the stop-motion animator pick their faces and they would create a little movie file of their faces.

Throughout this process, the animator was really able to focus on the expressions and, when they went out on set, they would have the exact faces that they needed, and a little sheet that told them exactly when those faces were needed for a frame of film."

On set, this allowed animators (supervising animator was Anthony Scott) to concentrate on nuances of the body — the face, in effect, was already taken care of. "It's unprecedented in stop-motion," McLean says, "you get this double whammy in *Coraline* where both [body and facial expression] could be honed and effective." Dialogue is played out as a digital audio clip "and you can go through frame-by-frame of that audio clip, in slow motion, and you start to hear when she's saying the word 'now' for example," McLean says. "In the computer they lay that audio down next to the faces and we start dropping in faces frame-by-frame. You can build an animated sequence lipsynced to *Coraline*. This is the first stop-motion film where you can turn off the sound to *Coraline* and read her lips!"