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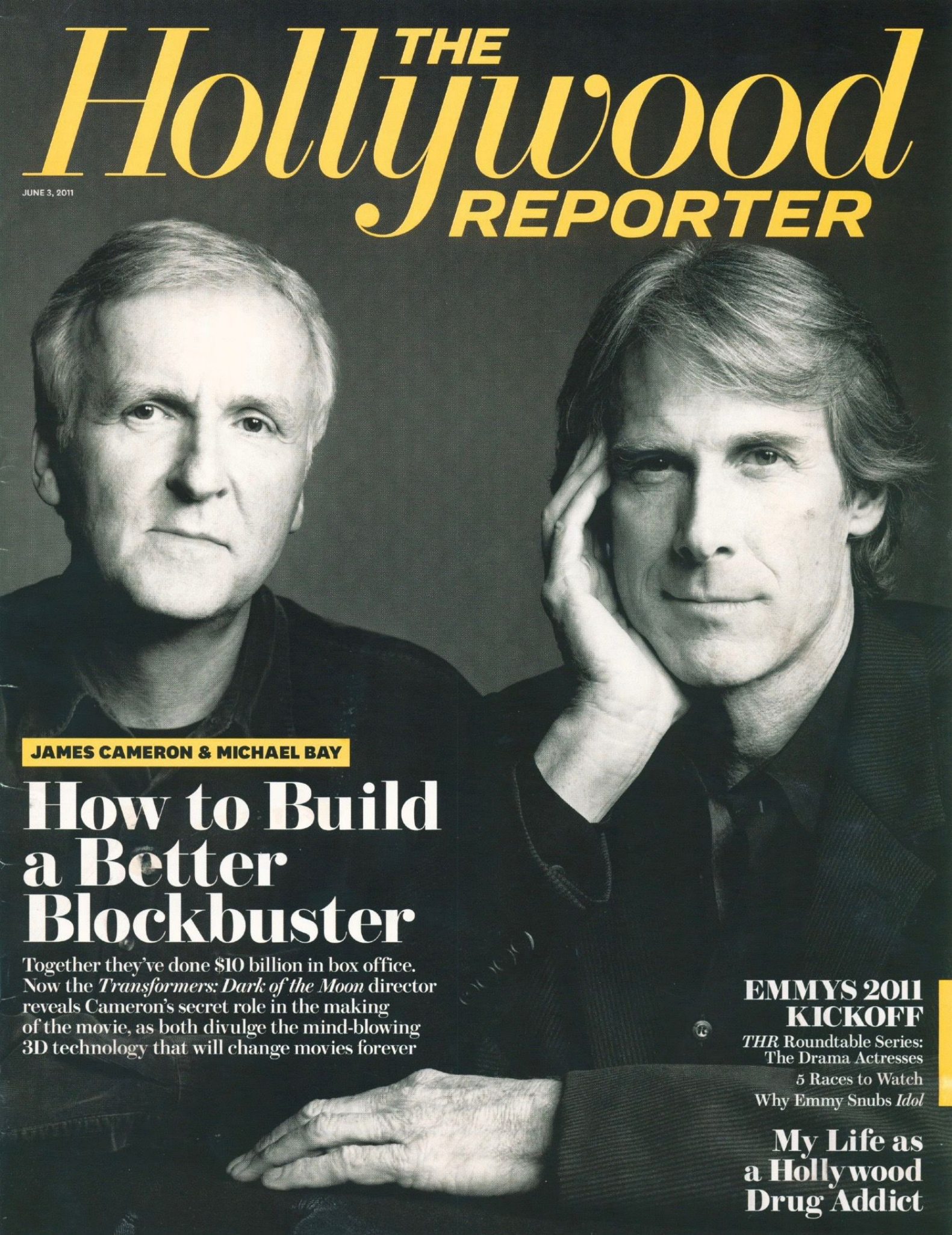


JAMES CAMERON & MICHAEL BAY

How to Build a Better Blockbuster

Together they've done $10 billion in box office. Now the *Transformers: Dark of the Moon* director reveals Cameron's secret role in the making of the movie, as both divulge the mind-blowing 3D technology that will change movies forever

EMMYS 2011 KICKOFF

THR Roundtable Series: The Drama Actresses

5 Races to Watch

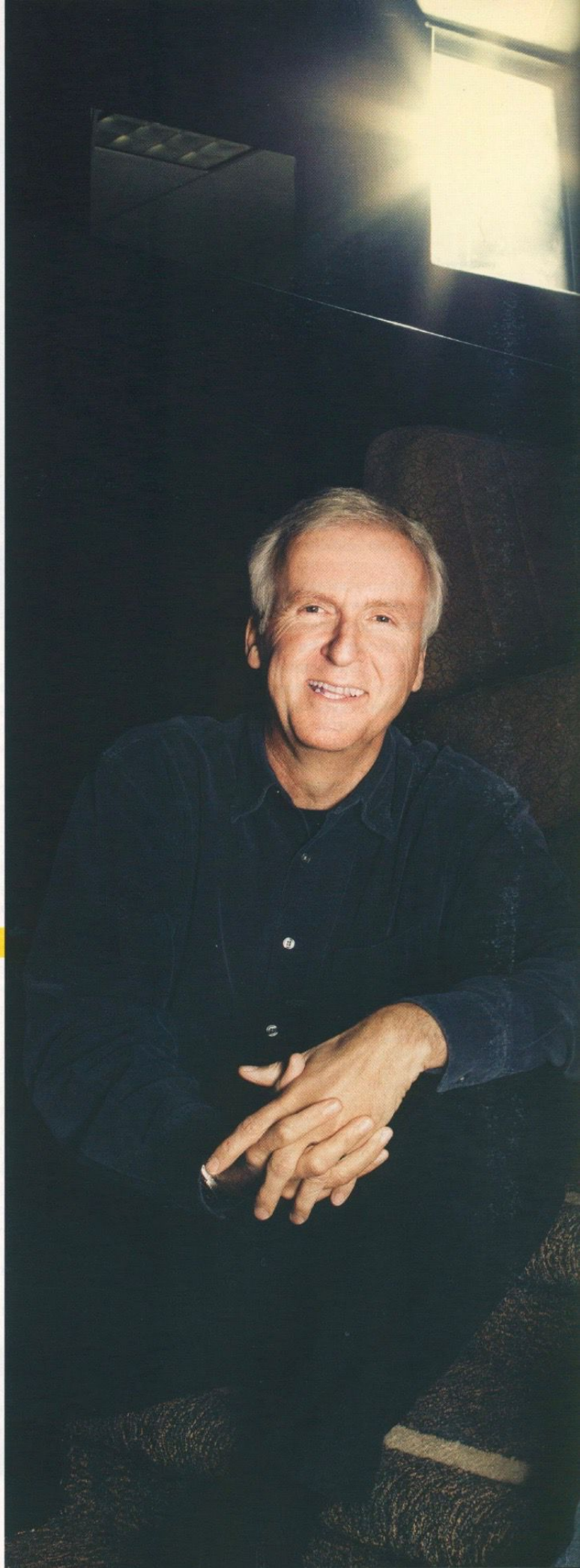
Why Emmy Snubs *Idol*

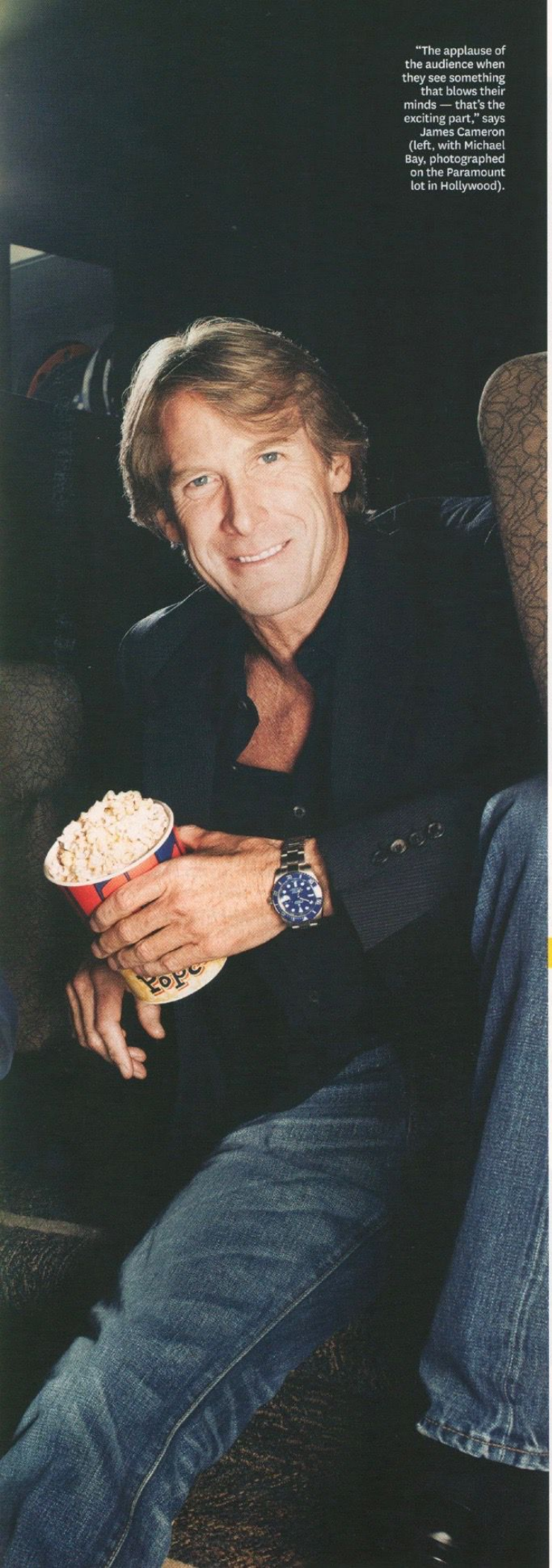
My Life as a Hollywood Drug Addict

JAMES CAMERON *and* MICHAEL BAY

Bay didn't want to do *Transformers: Dark of the Moon* in 3D until his old friend and 'idol' intervened. Now the two blockbuster titans come together to talk about the high-tech frontier fast changing film

By **JAY A. FERNANDEZ**
Photographed by **JOE PUGLIESE**





"The applause of the audience when they see something that blows their minds — that's the exciting part," says James Cameron (left, with Michael Bay, photographed on the Paramount lot in Hollywood).

AT THE PREMIERE AFTERPARTY FOR *TRANSFORMERS: REVENGE OF the Fallen* in June 2009, Michael Bay stood among well-wishers, took a deep breath and stated definitively that he was taking a break from the franchise. That decision lasted a week. But it took Paramount Pictures a lot longer to get Bay to commit to making the third film, *Transformers: Dark of the Moon*, in 3D — a move that would escalate the scale and appeal of the machines-come-to-life franchise, which had already grossed $1.55 billion worldwide, and would draw higher ticket prices to boot. (In 2010, 3D movies made up 21 percent of U.S. and Canadian ticket sales, about $2.2 billion, even as total box office remained static at $10.6 billion.) Bay was on record as having dismissed 3D as a "gimmick" and the cumbersome technology as a terrible fit for his fast-moving, aggressive filmmaking style. But in an unexpected turn, Paramount had a secret weapon.

James Cameron.

Bay and Cameron had first met in the mid-'90s, when Bay — who describes Cameron as "an idol" — was just beginning his feature-directing career and Cameron invited him to the set of *Titanic*. A decade later, Cameron extended the invitation again, but as he was showing Bay around his *Avatar* set, the run-and-gun director's reaction to all the lumbering, studio-bound 3D technology was, "This is *so* not me." Yet ultimately, Cameron's enthusiasm turned out to be key to convincing the reluctant Bay of the

new equipment's power, scope and flexibility. The $195 million *Dark of the Moon*, which opens June 29, is the *Pearl Harbor* director's first foray into 3D filmmaking, but Bay took full advantage of the technology and married it to his sweeping, muscle-bound camerawork. The result is a 3D sci-fi war film with astoundingly deep perspective and a real-world canvas upon which the Autobots, Decepticons and humans do devastating battle for command of Chicago — and all of Earth.

Sitting down for the first time to have an extended public conversation about the technology and its use in the new film during a special evening *THR* hosted with Paramount Pictures on May 18 moderated by *THR*'s Jay A. Fernandez, Bay, 46, and Cameron, 56, championed 3D's benefits and debated its limitations. Bay's film-purist philosophy often bumped up against Cameron's digital zealotry, while his criticisms of the groundbreaking equipment that Cameron and partner Vince Pace have developed prompted the *Avatar* filmmaker to defend its supremacy and plug its up-to-the-minute advancements. (Their Cameron-Pace Group is an industry leader in 3D technology and production services.) In the following exclusive transcript from the discussion, two titans of blockbuster filmmaking geek out on light spills and tech fixes, needle each other over who has the most toys and throw a spotlight on just why their talents have led to $10 billion worth of audience rapture.

But be warned: These guys are not casual gearheads. So the conversation below is steeped in tech jargon (*THR* tech guru Carolyn Giardina's handy footnotes should help), even as it provides revelatory insight into the filmmaking process in the modern age.

> **I'M KIND OF OLD-SCHOOL. I LIKE GOOD OLD-FASHIONED 35-MILLIMETER FILM. AND JIM GOES, 'GOD, WETA HAS SOME GREAT ALGORITHMS!' AND I'M SMILING, 'WHAT THE F— IS HE TALKING ABOUT?"**
>
> *— Michael Bay*

After he screened some of the 3D footage of *Dark of the Moon*, Bay's initial reaction was that the 3D was "too conservative."

Cameron on ... 3D IN THE HOME:

"It's all coming. You're going to see tablets and laptops that don't require glasses at all, that are auto-stereoscopic — that's right around the corner. And then within two to five years, you'll have big 50-, 60-inch screens that have multiple viewer angles that don't require glasses. And I think at that point it's a done deal. It's really just being held back by the content. We can't make movies fast enough."

At ShoWest two years ago, Michael, when you were accepting the Vanguard Award for Excellence in Filmmaking, you were less than enthusiastic about 3D technology, calling it "a gimmick." Obviously, you had a change of heart. So how and why did you come around?

MICHAEL BAY Years ago, Jeffrey Katzenberg called me and he says, "You gotta do 3D; I need directors like you to do 3D so we can get it going in the theaters ..." and I'm like, "Thank you, Jeffrey, no." Then I visited Cameron, whom I met on the set of *Titanic* when I was young. I was shooting *Transformers*, and he invited me to the set of *Avatar*. I walk in, and it's like Mission Control with all the cables and the men and women — more hard drives than you can even imagine. And I'm like, "Oh, this is *so* not me." And Jim was very polite. He stopped his shoot for about an hour, and he showed me around. You know, I'm kind of old-school. I like good old-fashioned anamorphic lenses, Panavision cameras, 35-millimeter film, where you can touch it, feel it — and 3D is not that. It's all ones and zeros.[1] And Jim comes up to me, he goes, "God, WETA has some great algorithms!" And I'm smiling, "What the f— is he talking about?" Then the studio asks me to do 3D for this one. And after a lot of investigating, the last call I made was to Jim. He said: "You gotta look at it as a toy. It's another fine tool to help get emotion and character and create an experience." And I'm always trying to create a great summer experience for the moviegoer.

Jim, what made you think this film was a good forum for your rig system?[2]

JAMES CAMERON I actually think that all films benefit from 3D in varying degrees. But when I heard that you were considering 3D, I thought, "Man, I gotta talk Michael into this somehow," because the marriage of your technical filmmaking and action, and the lucidity of the shot design that you create — these long, evolving shots that just go and go until your jaw's dropping — I thought, "I've got to see that in 3D." But I also knew that there were some impediments to that because you shoot really fast.

BAY A lot of live stuff, all real.

CAMERON Yeah, exactly. And the cameras came down in size, and then they went back up in size, now they're coming back down again.

BAY You bullshitted. You said, "Oh, we got a handheld." And you don't have a handheld.

CAMERON Yeah, we do.

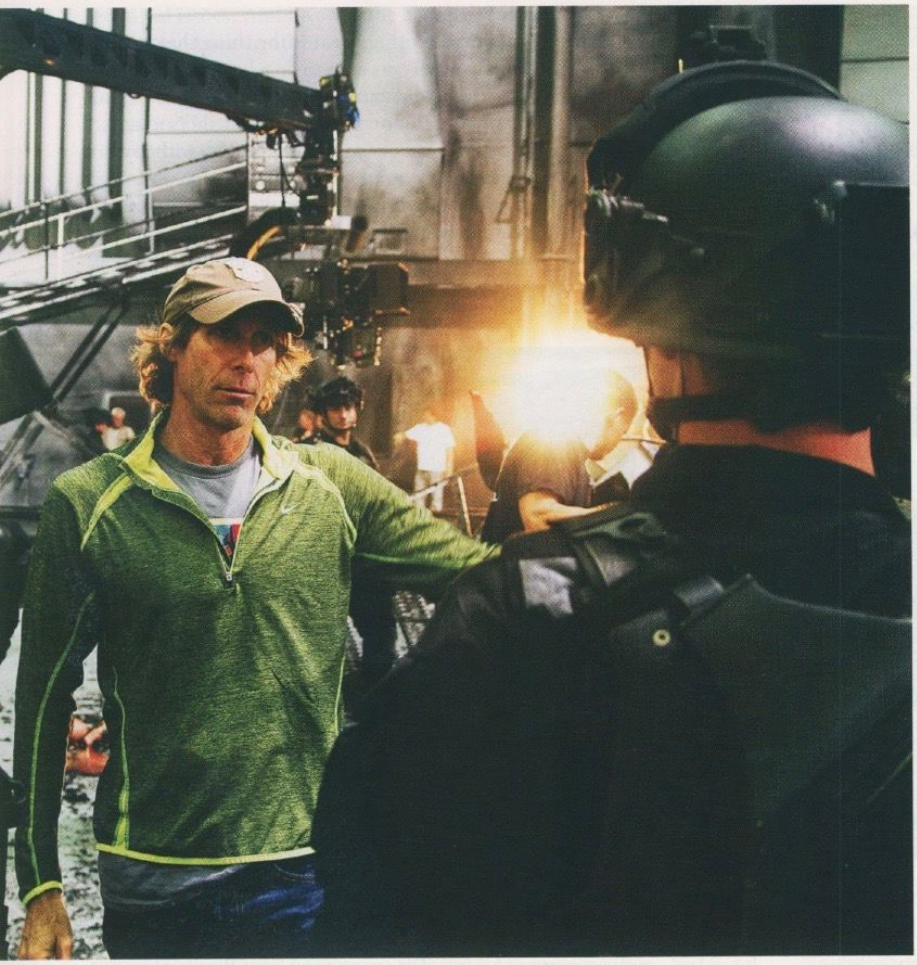
BAY You were like, "Oh, we put it on a Steadicam." I heard from people that you broke your back. (*Laughs.*)

CAMERON That's actually not true. On *Avatar*, I operated everything but the Steadicam stuff myself. We had a handheld rig. The movie was probably about one-third handheld. The problem is, the DPs were not satisfied with the cameras we used on *Avatar*, so they were more demanding about dynamic range and lensing and things like that. Then the rigs all got huge again.

BAY Yeah, and I got the huge rig.

CAMERON You got the big rig.

THR's Jay A. Fernandez (left) grilling Bay and Cameron in front of 400 students, executives and journalists May 18 at the Paramount Theatre on the studio lot.



You ultimately decided to use the Cameron-Pace Fusion rig. So what cameras did you choose to use with the rig?

BAY What are they? F35s?

CAMERON I think you used F23s and F35s,[3] if I'm not mistaken.

BAY They're big, they're cumbersome. You've got a big mirror. And it was a huge challenge trying to fit it into places and putting it on rigs that it's not meant to be on. We used the *Avatar* crew. They're one of the best crews around. They try to scare you: "Oh, you can only do 10 shots a day." And I'm like, "That's not good because I shoot 50, 60 a day, and that's not gonna work." We were able to get them up to speed. The worst of days are when you're in Chicago and you've got the whole camera tech department around the camera and the Austrian camera tech goes, "It doesn't look good." So it's a challenge because it's a brand-new beast.

CAMERON Well, I think the issue really was that you guys made the decision very, very close to the start of principal. If I had gotten the call a little earlier —

BAY Yes, I know.

CAMERON I would have been able to help steer you off some of those rocks. When we started developing these rigs initially, the goal was to make them extremely light, compact. I said: "They've got to be able to handhold. If I can't handhold, I'm not gonna shoot 3D." The Fusion system that we used on *Avatar* weighed 28 pounds, with two 10-to-1 zoom lenses on it, so focal-length changes were instantaneous, setups were instantaneous. I just moved it over. The problem was that between when we shot that, which was end of '07, beginning of '08, all the DPs jumped in and said, "We can't have the dynamic range of an F950;[4] we have to have this camera, this camera and this camera." The second the DPs got into it, it had to be some higher dynamic range, and they basically forced the 3D industry down a path. And at the exact moment you started shooting, the new smaller, high-dynamic-range cameras —

BAY The Arriflex cameras —

CAMERON Yeah, like the new Alexa M,[5] which actually isn't out until September, is a five-pound camera. So you just got caught in a time bind. But how did you find actually shooting in 3D? Setting aside technical issues.

BAY The first day was wonderful. We were shooting our [scenes on the] moon, and it was beautiful. It really fit very natural how we were shooting, and it was just great to sculpt with space. We got some great shots. I wake up the next morning, and I'm like: "I'm in love with 3D. This is a great experience." And my producer Ian Bryce calls me up. He says, "Mike, bad news. We lost the first day." I said, "What?" And he says, "Yeah, the hard drive is just gone." I said, "Does this happen a lot?"

CAMERON So it was a love/hate kind of thing?

BAY I ended up loving it. Things need to be a little more robust. With 3D, it's got a problem where you strobe if you pan too quickly. So this movie, I had to be more wide and slow, and it slowed the cutting down a bit. 3D, as you've said before in interviews, is like music, right? You can sculpt how it goes — more 3D, less 3D.

CAMERON I said it's just like audio: You can dial it in or dial it down. 3D's the same. If superfast kinetic cutting is the thing you want to be saying at that moment, you just dial back the 3D.

Was there anything that you actually did with this rig that hadn't been done before?

BAY We did a lot of stuff. We used his crew, and the Austrian, he's like, "This is f—ing crazy!" We're putting these rigs on cable cams and then we put a 3D camera following these wingsuit guys through the canyons of Chicago, around the buildings about 150 miles an hour.

CAMERON It's pretty cool stuff. I just saw the whole picture. I like the depth. I like the fact that you're using the 3D aggressively and really embracing it. Like you ever do anything that's not aggressive.

BAY We still have the ability to tweak stuff. Some of it's a little too conservative.

What did you have to do to get the 3D effect on the Birdmen?

BAY It's just a 3D helmet. I saw *60 Minutes* with those guys jumping off the Nordic cliffs.[6] I said: "Get those guys to my office. I'm writing an action scene for them for this movie." It took a year to get approval for that stuff, because we had to clear a mile and a half in Chicago. It's a French photographer who's one of the best jumpers in the world. When they're base jumping, the last guy has one second to make sure his chute is right or he hits the ground. That's how good these guys are. Shia [LaBeouf] was actually eating breakfast in the Trump in his underwear and he saw four men fall by his window. (*Laughs.*) Actually, [the 3D cameras are] adjusted to the human eye, so there's no interocular distance. You can't move it; it's fixed.

—FOOTNOTES—

1 The binary code that is the foundation of digital technology.

2 Cameron-Pace Group's Fusion 3D camera system involves the use of two digital cameras that are mounted onto the Cameron-Pace 3D rig in order to shoot 3D.

3 Digital video cameras made by Sony.

4 A Sony digital video camera released before the F23 and F35; George Lucas used the F950 cameras for 2005's *Star Wars: Episode III — Revenge of the Sith*.

5 A modular digital camera being developed by Arri through a partnership with the Cameron-Pace Group, which will have exclusive access to the first cameras in September; public availability is scheduled for first-quarter 2012.

6 In 2009, Steve Kroft traveled to Norway to do a story on extreme sportsmen — American J.T. Holmes, Norweigian Tom Erik Heiman and South African Julian Boulle — who used specially designed "wingsuits" to fly as fast as 150 mph.

CAMERON Those were SI-2K cameras?[7]

BAY Yeah. If it gets too close, it'll become uncomfortable. You'll see guys jumping out of an Osprey, and it gets a little uncomfortable, which means it's so close; it kind of messes with your head a touch. But that's 3D talk.

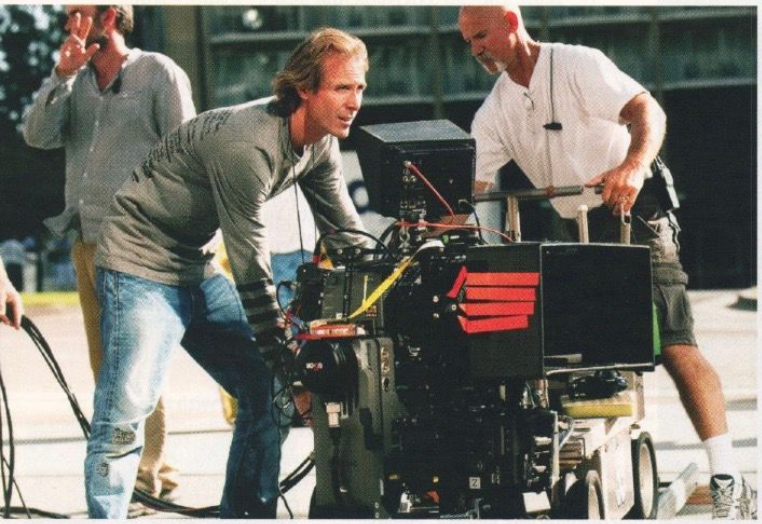
CAMERON It messes with your head. But there's a knob for that. (*Laughs.*)

How did 3D impact the budget?

BAY The bottom line is, if you want to do good 3D, it's very expensive. The camera equipment is expensive because it comes with a lot of techs, the labor. When you're doing special effects, you have digital artists, but they have to do about a third more work when they have to match two eyes. So depending how many shots you have, that incrementally increases. And there's a lot of tech fixes — it's not easy shooting 3D. It's never technically perfect, like where you shoot film and you get it back from a lab and it's like, "Oh, that's great." It doesn't come out like that with 3D.

Does it add days to your shooting?

BAY It didn't add any days to my shooting. That is the thing that I wouldn't let them do. The only way I was able to do a beast of this movie, shooting 3D my style, was I did camera tests with the crews and I timed them. Because I leapfrog a lot on set, I'm several shots ahead, and I wanted to see how fast they can change lenses and go with my style. And they were a very savvy group, they were very sharp. But with two cameras, I slowed down big-time. I would do my B-camera face stuff with a film camera because I just don't like the digital look at all. To me, there's just nothing more beautiful than film. We did a lot of tests with conversion houses. We spent seven months checking out every house. We found a style that fits, so I was able to shoot about 60 percent native.[8] Then you got maybe 15 percent all digital, so that could be full 3D. And then you have conversion shots. But sometimes you're shooting with a 3D camera and you'll have a problem with one of the eyes, and you'll have to convert it. It's not a perfect science. It's making sure two eyes can track things, and sometimes it's a lot of



"IT'S PRETTY COOL STUFF. I LIKE THAT YOU'RE USING THE 3D AGGRESSIVELY. LIKE YOU EVER DO ANYTHING THAT'S NOT AGGRESSIVE."

— James Cameron, to Bay about the latter's latest Transformers *movie*

The BILLION-DOLLAR DUO

As artists and businessmen, James Cameron and Michael Bay have helped advance the film, TV, commercial and technology industries

	FILMS GROSSES (*worldwide*) as DIRECTOR	FILMS GROSSES (*worldwide*) as PRODUCER	PERSONAL AWARDS	FILM AWARDS	COMPANIES	PROJECTS IN DEVELOPMENT
The CAMERON EMPIRE ▶▶▶▶	$5.82B total — BIGGEST HITS — $2.78B *Avatar (2009)** $1.84B *Titanic (1997)** **also writer*	$5.67B total — BIGGEST HITS — $2.78B *Avatar (2009)* $1.84B *Titanic (1997)*	 *Titanic* Oscars for best director, picture, editor	 *The Abyss* Oscar for visual effects	• Cameron-Pace Group • Lightstorm Entertainment • Earthship Productions	• *Avatar 2* (Fox) • *Avatar 3* (Fox) • *Fantastic Voyage* (Fox) • *The Last Train From Hiroshima: The Survivors Look Back*
The BAY EMPIRE ▶▶▶▶	$3.46B total — BIGGEST HITS — $836M *Transformers: Revenge of the Fallen (2009)* $710M *Transformers (2007)*	$1.89B total — BIGGEST HITS — $554M *Armageddon (1998)* $449M *Pearl Harbor (2001)*	 DGA Award for ads including "California Milk: Aaron Burr"	 *Pearl Harbor* Oscar for sound editing	• Platinum Dunes • Bay Films • Digital Domain • Institute for the Development of Enhanced Perceptual Awareness	• *Cocaine Cowboys* (HBO) • *Pain and Gain* (Paramount) • *Untitled Ouija project* (Universal) • *The Monster Squad* (Paramount)

technical issues. And he owns the camera system that I used.

CAMERON I have an advantage. (*Laughter.*) I get them to build the stuff the way I want it.

BAY Yes, because you own the company.

CAMERON The thing about this stuff is that every filmmaker is gonna use it differently. I started with 3D in '95, and I started with Vince Pace building digital rigs in 2000. So it was a seven-year development to get to *Avatar*, and it was still a little bit of a science experiment the first few days. We were still trying to figure out how to get it onto the Steadicam and balance the rig when the IO changed.[9] But after about the first week, the 3D never slowed me down at all because we were lighting for greenscreen. And when you're lighting for greenscreen and you're doing a lot of complicated effects, the 3D was lost in the noise of all the other problems of the shoot.

BAY It's more challenging when you're shooting in real world, with the sun. It's basically cameras one on top and one on bottom, or however you set your rig, and it shares a mirror. One will shoot the mirror, and then one will shoot through the mirror. So you have to watch light spill because it will wreck one of the eyes. It takes a lot of time.

CAMERON That's definitely true. When we first started building these rigs in 2000, the first thing we did was take them out on an expedition in the middle of the North Atlantic. And we were in storms and hurricanes and little boats racing around and all that.

BAY That's an action director there!

CAMERON Yeah, we figured, "Let's not screw around; let's take it down to the bottom of the ocean and take it in the aircraft and everything." But those were mostly side-by-side rigs.[10] For me, it's different tools for the job. And the beam-splitter rig[11] I would use for a shot that was closing in on somebody from a distance or tight close-ups. Anything more than six feet away from the action, I'd just shoot side by side.

BAY Yeah. Bottom line in terms of financial impact, it's about $30 million to the budget.

CAMERON The question is, how many million more are you gonna make with the film in 3D?

BAY Well, that's the gamble. But what's happening right now is there are so many 3D movies that are done badly, that are just post-converted so quickly, that you can tell some movie audiences are just getting turned off to the 3D because it's bullshit 3D.

CAMERON I think it's a danger for the business. I mean, we've found a way to get people back to the cinema, and we have a way to fight back against the immediacy of films delivered video-on-demand, on tablets, whatever. The 3D gets people back into the cinema experience, the big screen, the stuff that we love. But we're abusing it left and right. Some studios are making poor decisions about what films to convert and how to convert and how rapidly to do it and trying to wedge it into postproduction like it's a sound mix.

Cameron on ... WHY 3D HAS TO USE DIGITAL AND NOT TWO FILM CAMERAS:

"The first thing I shot in '95 was *T2 3D*. I shot 30 frames per second, 70 millimeter onto these big beam-splitter rigs, and they literally weighed 350 pounds! So I haven't shot on film since '97. I have no intention of going back. But the digital cameras have progressively gotten better over time, and it's really a linear curve. As far as I'm concerned, they've surpassed film. I went to digital because I knew film wasn't an answer for 3D, and I wanted to shoot 3D. So I was adopting digital even before it was equal to film and using workarounds to get the look as much as possible, but knowing where it was weak and where it was strong. Where it was strong was being super lightweight and small. Different people have different thresholds for adopting new tools. Everybody's got the way they're used to working, and that's what makes them powerful as artists."

From left: Bay shooting *Dark of the Moon* on the streets of Chicago, the film's Shia LeBeouf and Rosie Huntington-Whiteley, Autobots leader Optimus Prime.

Even with some of the flaws that you found, Michael, would you consider yourself a convert now? Would you shoot another film in 3D?

BAY Yeah. I don't think everything's right for 3D. This was appropriate for 3D, and it was a way to change this movie experience and a way to feel these robots. I think it worked for this picture.

Do you have a fourth one in you?

BAY I don't know. It's a lot of work. (*Laughter.*)

For both of you, is there anything that 3D can't do yet that you need it to do, want it to do, that you're going to make it do?

CAMERON With effects, there's nothing you can imagine that can't be done right now — it's just a question of money and time. The great thing about digital is there's infinite headroom, and it's just gonna improve. With the 3D, we're working hard to make the cameras smaller, more robust, more user-friendly, take some of the techs out of the loop.

BAY It works pretty well, but you want it to be where you can take the camera and just throw it up and shoot a close-up in five minutes.

CAMERON You can do that now. But literally — *just now.*

BAY Just now. In this movie, I couldn't. (*Laughter.*)

CAMERON You just missed it. How do you think I feel? I had to make *Avatar* a couple years ago. THR

—FOOTNOTES—

7 A digital video camera made by Silicon Imaging.

8 "Native" means shot in 3D.

9 IO stands for interocular, or the distance between the centers of the lenses of the two cameras.

10 A 3D configuration where the two cameras — one for the left-eye image and one for the right — are positioned side by side.

11 A 3D configuration where the two cameras are positioned perpendicular to each other and use a mirror.