

Chapter 5

Waiting for the AR 'Killer App': Pokémon GO 2016

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Abstract

In this chapter, Rhodes asks why, despite the commercial success of Pokémon GO, a large popular audience for augmented reality experiences has not yet gathered. Drawing a comparison to the quick and massive popularity of cinema at the turn of the last century, Rhodes postulates on what audiences desire from this ever-emerging medium. The chapter re-draws definitions of the augmented reality medium and postulates on its unique potentialities. The central question of the chapter is an analogy: if, in 1903, *The Great Train Robbery* established the cinematic montage form and inspired the creation of massive cinema audiences and venues, what could be *The Great Train Robbery* of AR?

If one considers the dangerous tensions which technology and its consequences have engendered in the masses at large— tendencies which at critical stages take on a psychotic character— one also has to recognize that this same technologization has created the possibility of psychic immunization against such mass psychoses.

— Walter Benjamin

The Augmented Reality medium seems to be forever emerging and never fully emerged. I first encountered AR technology in 2006 through a demonstration of the D.A.R.T. project (the Designers Augmented Reality Toolkit) by Jay David Bolter from Georgia Tech's Augmented Environments Lab. Just a few years before the popular adoption of the iPhone, the impressive DART toolset promised to open up quick development of AR experiences for design creatives. Now, in 2019, Adobe's Project Aero will "realize the potential of this new medium;" they promise AR is now "poised to disrupt the way we learn, work, and play" (Adobe 2018).

ARToolkit (2001), D.A.R.T. (2004), Junaio and Layar (2009), Vuforia (2010), Aurasma (2011), now Project Aero— over the last decade and a half, all of these platforms have promised popular adoption of augmented reality. What's going on? Why is AR always poised to arrive but never arrived?

We in the new media design community have awaited the AR 'killer app'— an augmented reality experience so popular that it thrusts the medium into popular acceptance: *The Great Train Robbery* of AR, that would establish the fundamental language of the new medium and inspire augmented reality venues and audiences across the world. ...Something to finally make AR emerge.

Why didn't *Pokémon GO* do this in 2016?

Blockbusters

To make a comparison: in cinema, at the end of 1895 the Lumiere brothers charge admission for the first short films at the Grand Cafe. By 1903, *The Great Train robbery* plays to popular success. Cinema had found its critical form, filmic montage, within 8 years of the first prototypical movies. By 1917, *Birth of a Nation* is one of the biggest cinema blockbusters of all time. Cinema had completely created its audience just 22 years after its birth.¹

¹ And it's not just in cinema. In his essay, "Little History of Photography," Walter Benjamin notes, after the presentation of Daguerre's invention in the Chamber of Deputies in 1839, "Things developed so rapidly

From *Hollywood Reporter*, describing *Birth of a Nation*'s initial run on its 100 year anniversary:

Tickets at New York's Liberty Theater, where it played for 44 weeks, topped off at an unheard-of \$2.20 (\$51.50 in today's dollars). Throughout the silent era, the film was never far from a marquee. "Still the daddy of 'em all!" crowed *Variety* trumpeting a re-release in 1923 (Doherty 2015).

Time magazine:

Griffith's film is estimated to have earned \$18 million in its first few years — the astounding equivalent of \$1.8 billion today. In current dollars, only *Avatar* and *Titanic* have earned more worldwide (Corliss 2015).

Pokémon GO was a commercial hit. It was the second place-based AR game by Niantic; the first was *Ingress*, launched in 2012. You could say that in terms of app downloads, *Pokémon GO* is the blockbuster (*Birth of a Nation*) to the earlier proof of concept (*The Great Train Robbery*) game *Ingress*.

Writing at the end of 2016, the *Chicago Tribune* remarks on the game's quick adoption, and also on its dangers, in the article headlined, "Pokémon Go for broke: Gaming sensation of 2016 swept the world, leaving havoc in its wake." "Unveiled July 6, it gathered 45 million players worldwide in its first 12 days," but also 110,000 distracted driving incidents, and then a laundry list of embarrassing incidents of virtual distractions meeting real world ramifications: a criminal, busy playing, accidentally wanders into a police station where he is arrested; a gaming couple wander into the tiger enclosure at the zoo; multiple incidents of players stumbling across dead bodies in obscure locations (the article also features widely distributed photographs of a smartphone gamer playing *Pokémon GO* amidst the rubble of the Syrian city of Duoma) (Borrelli 2016). In *Wired*, an article appearing two years after the game's July 2016 launch states, "By every measure that matters, Pokémon Go has been a winner. Since its launch, it has almost never dropped out of the daily top 100 downloaded apps in both the iOS App Store and the Google Play Store, according to app analytics company App Annie. It has been the top-grossing app in the Play Store this entire week. In two years, according to an estimate by app analytics firm Apptopia, it has taken in \$1.8 billion in revenue" (Barrett 2018).

And critics talked about the game in popular journalism, gaming and academic publications. In art and media studies, one author called it "technological faddism," and bemoaned the lack of narrative and educational framework (in *Making Publics, Making Places*) (Peacock 2016, 106). Another claimed, "the game has conclusively demonstrated the power of digital technology to capture imaginations and create an engaging platform from little pieces of information that come

that by 1840 most of the innumerable miniaturists had already become professional photographers, at first only as a sideline, but before long exclusively"(Benjamin 1999, 515).

together in a digital-physical ecosystem. ... the game demonstrates the first successful, large-scale amalgamation of the digital and physical worlds and showcases the 'augmented reality' that we've been talking about for decades." (American Society for Engineering Education) (Johri 2016). For another, it realized Guy Debord's spectacle: "seems to have vindicated Debord's approach to the life vs the spectacle issue. The multiplication of screens even suggests a mise en abyme of the concept as we spend an increasing part of our lives watching merchandise such as smartphones that showcase the world as [...] the omnipresent reality of the virtual" (*The Spectacle 2.0: Reading Debord in the Context of Digital Capitalism*) (Frayssé 2017, 67). It was the realization of Walter Benjamin's flaneur (*Performing the Digital: Performance Studies and Performances in Digital Cultures*) (Schipper 2017, 206-7). Even Žižek weighed in, describing it as the perfect semblance of ideology, "a closure that precedes perception" (Žižek 2017, 119). That is to say, academic criticism of *Pokémon GO* rounded up all the usual suspects.

But what didn't happen, was massive public adoption of the AR medium. Working in the field, I still find myself carefully explaining to students and clients what AR is and isn't— because no one really seems familiar with it. Where are all the AR theaters? Why hasn't AR found it's popular audience?

Not Enough Novelty (Sci Fi Disappointments)

I have often imagined what it was like for early observers of photographs and films. Walter Benjamin, in his "Little History of Photography," reports the experience of the German painter, Max Dauthendey, on viewing some of the first Daguerreotypes:

"We didn't trust ourselves at first," he reported, "to look long at the first pictures he developed. We were abashed by the distinctness of these human images, and believed that the little tiny faces in the picture could see us, so powerfully was everyone affected by the unaccustomed clarity and the unaccustomed fidelity to nature of the first daguerreotypes" (Benjamin 1999, 513).

Benjamin describes the uncanny discomfort of subjects' eyes, looking at the camera, staring out at the viewer. For cinema, you can imagine the effect of early film through animations of Eadweard Muybridge's locomotion stills (the internet is full of animated GIFs of them). They are poignant— though not all of them, some seem mere technical examinations of horses and carts and actions, but the expressive figures: a woman dancing, two women smoking cigarettes as if taking a break from their nude modelling work in front of Muybridge's grid and his strange series of photo boxes. When these are animated, the figures come eerily to life. Uncanny. Like the femme of Chris Marker's 1962 film, *La Jetée*. There is a certain memento mori punctum— like Barthes' mother featured in a particular photo that, for him, catches her character— because these subjects are more dead and gone than in any other moving image. We can't see life before 1871 and Muybridge's subjects— beyond that, photo stills, and then the rest of history is

“merely somebody’s panting prose,” as the photographer Hollis Frampton put it (Frampton 1983, 88). Mechanically capturing images was a fundamental shift in the human relationship to the virtual. And, for the early audience, it must have been astonishing.

Are we awaiting such an experience from AR? Benjamin, in the same essay, describes a special, magical quality of the photograph. He terms it the “optical unconscious” of the photograph: the excess of denotation in the photo, capturing everything in front of the lense with an inhuman fidelity, “meaningful yet covert enough to find a hiding place in waking dreams, but which, enlarged and capable of formulation, make the difference between technology and magic visible as a thoroughly historical variable” (Benjamin 1999, 513). Miriam Bratu Hansen, in her analysis of Benjamin’s essay, describes this unconscious as “the idea that the apparatus might record and store aspects of reality invisible to the unarmed human eye, or moments of contingency and indeterminacy that were neither perceived nor intended by the photographer but might at some later point be released to the searching gaze of the beholder” (Hansen 2004, 38). In this unconscious, the mechanical nature of the photograph makes it, not cold and inhuman, but uncanny, ghostly, magical. This magical experience of the mechanical seems harder to come by today, outside of science fiction. The imagination of robot driven cars, visualized in films like *Total Recall* (1990), has been realized with the mundane Uber app giving instructions to a contract (human) worker. Virtual Reality, visualized in *Star Trek the Next Generation* (1987) as a magical ‘holodeck’, has been realized with smartphone-stuffed cardboard visors held to people’s faces. Sci-Fi films like *Minority Report* (2002) and, more recently, *Blade Runner 2049* (2017) have pictured augmented reality like a Méliés film— virtual images appearing magically onto (filmic) reality. The realization, in which you see on a smartphone screen the cartoon Pokémon placed onto arbitrary space, feels, as we say in art studio critiques, ‘unmotivated’.

Certainly arbitrary tracking AR is more of a feature in *Pokémon GO*, than a central element. The game is based around a geo-locative scavenger hunt. This is the other stream of AR technology, explored since 1999 and ambitiously realized in *Ingress* and *Pokémon GO* (Arth 2015). It is tricky to compare this GPS geo-locative AR to its imagistic brethren; and I wonder if it is even properly AR. It is an art of maps, and adventurous like that cartographic history. But it is certainly not spectacle. The poster for the *Pokémon GO* experience is the minor feature of the SLAM AR tracking, and it was genius for the game developers to give the visual tracking feature to provide a shareable image of the experience, even if the essence of gameplay is actually geo-locative and not imagistic. Another AR application has risen over the same period— another killer app, or really a killer feature— in which visual tracking based AR illusion is central: face-tracking to put bunny ears on photos. In Instagram, Meitu and Snapchat— and more recently to self-create lip-sync videos in the app Musically— visual AR has reached a popular audience like nickelodeon halls showing film loops of ‘man standing on a garden hose’.²

² Lumiere’s *Le Jardinier* (1895) is considered one of the first, if not the first, comedy film, and was part of the program at the December 28, 1895, premiere screening at the Grand Cafe (Gaines 2004, 1309).

It is a small thing, and popular, and maybe, like the nickelodeon, it is from this vector that the future will come.

Not that other media haven't disappointed. If you read Eisenstein on montage— particularly his letter beseeching world audiences to not fall in love with sync-sound 'talkies'— it is clear much more was expected of filmic montage than ever arrived. Eisenstein warned against the "fearsome eventuality of meaninglessness and reactionary decadence," and hoped for "unprecedented power and cultural height," probably something like his intellectual montage that would be "the realization of revolution in the general history of culture; building a synthesis of science, art, and class militancy" (Eisenstein 1977, 259, 83). Vertov, in his *We: Variant of a Manifesto*, calls out to a future: "WE believe that the time is at hand when we shall be able to hurl into space the hurricanes of movement, reined in by our tactical lassoes" (Vertov 1984, 9). D.W. Griffith famously predicted libraries of history would be replaced with films: "There will be no opinions expressed. You will merely be present at the making of history. All the work of writing, revising, collating, and reproducing will have been carefully attended to by a corps of recognized experts, and you will have received a vivid and complete expression" (New York Times 1915). And maybe all of this arrived for cinema, in the form of Youtube, Vine, and the History Channel, but not the romantic vision.

And if we have not yet seen the *The Great Train Robbery* of AR— a work that establishes, for popular audiences, what this thing is and how it will work— do we know what we are waiting for?

What are we waiting for?

First, let's call the question— what is AR again? Augmented reality has always had a hard time defining itself. Recently, the term is confused with virtual reality. More than a decade ago, the DART project acknowledged the confusion around defining AR: "Augmented Reality (AR) has been used to describe many different kinds of computer-augmented experiences that augment the physical world with virtual media" (GATech AEL 2004). A current Wikipedia definition:

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real-world are "augmented" by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory, and olfactory. The overlaid sensory information can be constructive (i.e. additive to the natural environment) or destructive (i.e. masking of the natural environment) and is seamlessly interwoven with the physical world such that it is perceived as an immersive aspect of the real environment. In this way, augmented reality alters one's ongoing perception of a real world environment, whereas virtual reality completely replaces the user's real world environment with a simulated one (2019).

This Wikipedia definition overstates things a little. Certainly AR strives for a *semblance* of seamlessness, just as the craft of cartooning seeks a semblance of reality— but the focal point of AR is frequently the specific seam between media of different registers: the pleasure of a known virtual combining with the known real, and all combined together into pixels. As in a magician’s trick, without recognition of the disjuncture of the illusion, there is no trick.³

More exacting definitions have come from technologists and practitioners.

Azuma in 1997:

VE [Virtual Environment] technologies completely immerse a user inside a synthetic environment. While immersed, the user cannot see the real world around him. In contrast, AR allows the user to see the real world, with virtual objects superimposed upon or composited with the real world. Therefore, AR supplements reality, rather than completely replacing it. [...] AR can be thought of as the "middle ground" between VE (completely synthetic) and telepresence (completely real) (Azuma 1997, 356).

AR researcher Fernandez Alvarez has written, AR’s goal “is simply to overcome the difficulties of understanding due to different levels of conceptual abstraction presenting different traditional representation systems” (Prieto 2017, 313).⁴ So for Azuma, AR is along a spectrum, in between the two ‘perfect’ similitudes: our experience of reality and a virtual construction of a reality. And for Alvarez, one of the essential possibilities for AR is to combine different representational systems (such as graphics or still photography combined with live viewing).

These definitions leave out one critical element: the computer. A confusion in defining AR, is that casual combinations of virtual and real happen all the time, and have throughout history. In fact, you could say that human history itself is a combination of virtual with real, as are civilization, culture, and language. In a more pedestrian mode: if you and I are both gazing at a landscape, and I tell you a story that takes place in that landscape— a story from my own memories, or completely made up— isn’t that an augmentation of real space, presented for an audience? And what about magic mirrors (or mirrors in general), Pepper’s Ghost, and other illusions? But in popular usage, ‘augmented reality’ is a term which refers to new technology, and it is essentially caught up with the idea of humans interfacing with computers. And not

³ I would liken this to the uncanny valley in robotics. A seamless integration of computer generated virtual with real is the goal of cinema special effects. A delineated integration of virtual and real is the realm of AR. And between the two lies discomfort or insult. It is interesting, in regard to the comparisons between photography, cinema, and AR, to note Masahiro Mori’s discussion of the effects of movement in “amplifying the peaks and valleys” of this phenomenon in his 1970 essay (Mori 2012, 2).

⁴ Translated by J.F. Prieto. The original Spanish: “El objetivo final de todas estas “máquinas de visualización” consiste en superar las dificultades de comprensión debidas a los diferentes niveles de abstracción conceptual que presentan los distintos sistemas de representación tradicionales empleados para comunicar un diseño espacial: planta, alzado, sección, perspectiva, axonometrías y modelos a escala” (Alvarez 2010, 114).

interfacing through screens in a normal sense—in fact it is specifically about going beyond the screen. Every day, almost constantly, we augment the real world with computer generated virtual through our own handheld rectangular smartphone screens, and that augmentation is typically contextual, frequently geo-locative, and combines multiple media. Instead of this new smartphone banality, AR is about bringing that virtual computer world into our human space, outside the boundaries of the screen. That is why the following image is an icon of AR:

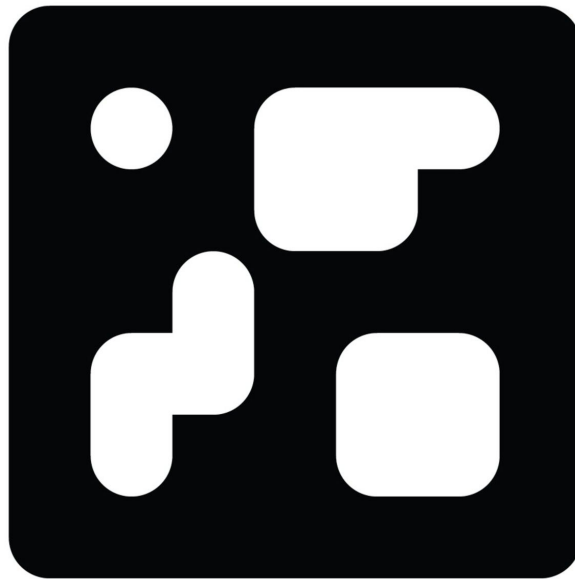


Fig. 5.1 AR fiducial (SnapDragonAR 2007 / Courtesy of Andrew Roth and Future Stories)

The fiducial. These early robot-vision visual codes, made to be placed into the real world so the computer can register physical reality, are the manifestation of the AR idea: to bring the computer into our real human space, via ways of seeing we cannot understand.⁵ In this respect, AR is like photography as described by Talbott in 1839: “From all these prior ones [the Camera Lucida and Camera Obscura], the present invention differs totally in this respect (which may be explained in a single sentence), viz. that, by means of this contrivance, it is not the artist who makes the picture, but the picture which makes ITSELF.” (Talbot 1839). AR is about a computer seeing, and then by itself, through pre-planned computation and processing, creating a picture for us beyond the screen.

⁵ This particular fiducial was developed as part of the Pentag system for what would become SnapDragonAR, developed at York University’s Future Cinema Lab with Mark Fiala shortly before the iPhone was launched.

The early AR art collective, Manifest.AR, laid out a raison d'être for AR in a 2011 manifesto. An excerpt:

The AR Future is without boundaries between the Real and the Virtual. In the AR Future we become the Media. Freeing the Virtual from a Stagnant Screen we transform Data into physical, Real-Time Space.

The Safety Glass of the Display is shattered and the Physical and Virtual are united in a new In-Between Space. In this Space is where we choose to Create.

We are breaking down the mysterious Doors of the Impossible! Time and Space died yesterday. We already live in the Absolute, because we have created eternal, omnipresent Geolocative Presence.

In the 21st Century, Screens are no longer Borders. Cameras are no longer Memories. With AR the Virtual augments and enhances the Real, setting the Material World in a dialogue with Space and Time (Manifest.AR 2011).

This was meant to read like Vertov's 1922 kino manifesto—a call to arms for a new digital futurism centered around this technology. Re-reading it now, I am struck by the insistence on a digital space beyond the screen. These AR ambitions have been subsumed in the rise of VR over the last 3 years. The differentiation of AR from VR is important and difficult. In my own work with the Chicago History Museum, creating place-based experiences of historical films and photographs, our technological implementation has ranged from on-site arbitrary AR tracking, to Google Street View, to VR videos and apps—all to provide the same sorts of educational experiences.⁶ Often AR and VR can be used towards the same experiential ends: combining preprogrammed content with a sense of place. My own working definition of augmented reality—based on popular semantics, lecturing to students, and working professionally with curators from a range of institutions—is this:

Whereas 'virtual reality' is a sequence and/or duration of immersive images presented through an interactive display for the purpose of giving a feeling of presence; 'augmented reality' is a type of interactive, spatially aware media in which a live image of the audience's immediate world is superimposed with

⁶ *The Chicago 00 Project* comprises a series of new media publications in apps, videos, and VR stills. The first publication was an app-based augmented reality experience at the site of the Eastland Disaster, where a passenger ferry capsized on the Chicago River in 1915. VR panoramas of the site, created as research tools, were shared on Google Street View, and because of their success (over a million views), subsequent projects used VR to share historical photos superimposed on their present day sites: the St. Valentine's Day Massacre, the 1933 Century of Progress World's Fair, and the 1968 DNC protests. www.Chicago00.org

media from another source— especially media from a different framework of representation, such as still photographs, graphics, maps, cartoons, etc.

And my own diagram to differentiate the media:

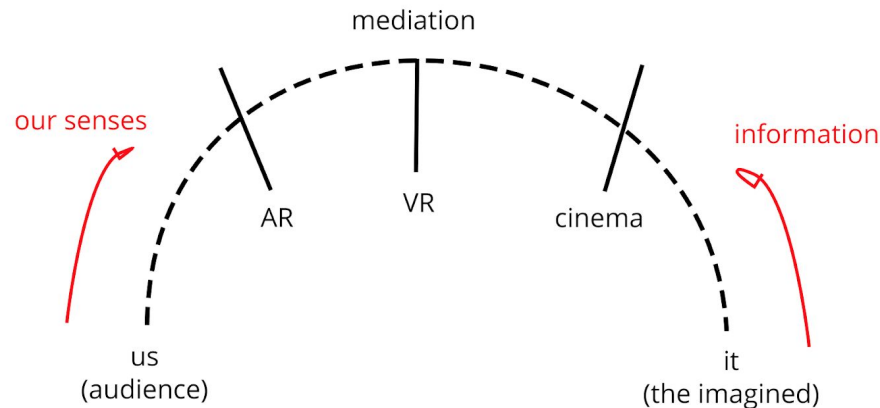


Fig. 5.2 Diagram of new mediation (Rhodes 2018)

In this diagram, AR is far from the seamless 'hot' (alla McLuhan) HD media, and much more about the audience performing a closure across borders. You could add Photography far to the right, and comics far to the left.

The AR *Great Train Robbery*

If there is to be an AR killer app— something that brings AR to popular audiences— it must demonstrate its essential form. We first have to know the essence of AR, to answer 'Has it arrived?' To ask, 'What is the montage of AR?' should answer the question, 'What is its *Great Train Robbery*?'

Benjamin, in his second version of "The Work of Art in the Age of Its Technological Reproducibility," makes a point of semblance. He famously says this about cinema:⁷

⁷ In a footnote, Benjamin writes: "Before film had started to create its public, images (which were no longer motionless) were received by an assembled audience in the Kaiserpanorama. Here the audience faced a screen into which stereoscopes were fitted, one for each spectator. In front of these stereoscopes single images automatically appeared, remained briefly in view, and then gave way to others. Edison still had to work with similar means when he presented the first film strip- before the movie screen and projection were known; a small audience gazed into an apparatus in which a sequence of images was shown. Incidentally, the institution of the Kaiserpanorama very clearly manifests a dialectic of

The most important social function of film is to establish equilibrium between human beings and the apparatus. Film achieves this goal not only in terms of man's presentation of himself to the camera but also in terms of his representation of his environment by means of this apparatus. On the one hand, film furthers insight into the necessities governing our lives by its use of close-ups, by its accentuation of hidden details in familiar objects, and by its exploration of commonplace milieus through the ingenious guidance of the camera; on the other hand, it manages to assure us of a vast and unsuspected field of action [Spielraum].

Our bars and city streets, our offices and furnished rooms, our rail-road stations and our factories seemed to close relentlessly around us. Then came film and exploded this prison-world with the dynamite of the split second, so that now we can set off calmly on journeys of adventure among its far-flung debris (Benjamin 2008, 37).

Throughout the essay, Benjamin returns to the idea that this new technology, through its mechanical nature and quick movement, leaves behind the semblance of still photography, and allows for a media of play. And this is not limited to audiences in the theaters, but allows for modern society to engage with their changing lives filled with all its complicated apparatus. In cinema, it is the stringing together of the changing, unexpected salad of perceptions: a camera which can cut in any moment to another view, another face, another object or setting, as if dreams emerging from the unconscious, and yet we, the audience, are able to endure— and even more, collect these together into a narrative experience. We need something similar of AR: a medium that allows us to play. And that play space is not in the moment of cuts between views, but in the space between the computer and our perception, emanating from its computations reacting to ever-changing surroundings. We can hope, for an experience that gives us a comfort and engagement with the confusing combinations of computer and human that surround us, so we can set off calmly on our journeys.

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development. Shortly before film turned the viewing of images into a collective activity, image viewing by the individual, through the stereoscopes of these soon outmoded establishments, was briefly intensified, as it had been once before in the isolated contemplation of the divine image by the priest in the cella” (Benjamin 2008, 52).

Doesn't this sound like AR on the smartphone?

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