Whose Skies?

Drones, Privacy, and the Law

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Ethereal minstrel! pilgrim of the sky!
Dost thou despise the earth where cares abound?

—"To a Skylark," William Wordsworth

Three years ago we wrote that it wouldn't be long before assessors used drones to do their jobs more frequently, efficiently, and effectively, but that laws and regulations were struggling to keep up with this emerging technology (Cunningham and Cunningham 2013). As we write today, this technology has begun to come of age. A spirited national conversation is now roiling over the issue of these little flying toys with cameras that seem to be buzzing everywhere—over parks, backyards, and city alleyways. Drones are the consumer-level versions of the more expensive, remotely piloted vehicles that commercial operators refer to as "unmanned aircraft systems," or UAS. They have caused a sensation by allowing for the easy collection of high-quality still photos and live video feeds often less than 100 feet above ground level. A drone can see whatever is left out in the public eye.

Yes, it's real. A remote-controlled chainsaw drone.
(https://www.youtube.com/watch?v=6Viwwetf0gU; photo permission courtesy of Noodletail Videos)

But the question asked by so many individuals going about their own private activities (often on their own private properties) is, Should there be a private eye-in-the-sky trained on me, especially when I'm in private? This article examines these concerns under the light of historical perceptions of personal privacy, the U.S. Constitution, state legislation, and court decisions.

Drones in the Spotlight

With automated flight-capable, high-definition camera-equipped drones available on the internet or at hobby stores for only a few hundred dollars, many people without any previous flight experience are picking up drones for a variety of purposes. For example, mountain bicyclists, skiers, and daredevils of every stripe have taken to positioning drones to capture their exploits.

Some of drone pilots' more foolish actions have caught the attention of federal agencies. Curious drone pilots flying near forest fires have grounded aerial firefighting operations. Drones chasing bighorn sheep have resulted in the exclusion of drones from all national parks (Costello and Fieldstat 2015). In April 2015, a drone pilot was Tasered and arrested by a park ranger at the Kilauea volcano after being repeatedly told to stop flying near a massive crowd of tourists watching the lava lake at night (Lincoln 2015).

Notwithstanding the popularity of consumer-level drones for all manner of tomfoolery, not to mention high-profile publicity stunts, savvy operators are testing new domestic and commercial drone applications, for instance, checking home gutters for obstructions or locating breaks in cattle fencing. Commercial photographers have begun to use drones for wide-angle tasks, such as a large group shot at a wedding or high school graduation. Drone photography's current ubiquity has even earned a place in the common lexicon for the noun "dronie,"

DRONE LEXICON

BLOS (Beyond line of sight)—FAA rule that a drone cannot fly further than can be seen by the drone pilot. This is specified to be a half-nautical mile, which is also the range of most of the radio controls used to pilot the drone.

COA (Certificate of Authority)—Special permission from the FAA to operate a drone in restricted airspace or above 400 feet altitude.

Cyber-drone—A drone capable of hacking WiFi connections.

Drone—Any unmanned mobile device in the air, on water, or on the ground.

Dronerazzi—Drone-using paparazzi.

FAA (Federal Aviation Administration)—Agency that is working to regulate drone activities in the National Airspace System.

Fixed Wing—A drone that looks like a traditional aircraft with non-moving wings attached to a fuselage.

FPV (First-person view)—Video images detected by a camera on an unmanned aerial vehicle (UAV) and transmitted in real time to the remote pilot of the UAV.

Geofencing—Using GPS coordinates to restrict where UAVs can travel.

Hexacopter—UAV with six rotors.

NOTAM (Notice to Airmen)—A report to pilots that a drone can be expected to be flying in a specific area on a specific date.

Octocopter—UAV with eight rotors.

Predator—Military UAV.

Quadcopter—UAV with four rotors.

Reaper—Military UAV.

Rotary Wing—A drone with horizontal propellers capable of vertical take-off and landing. The propellers function like wings to provide lift.

RPV (remotely piloted vehicle)—Military term for a drone.

Section 333 and Part 108—Permissions from the FAA for businesses to operate drones for commercial purposes.

TFRs—Temporary flight restrictions.

UAS (unmanned aircraft system)—The term *system* refers to all of the gear and people required to work with the drone and the data it collects.

UAV (unmanned aerial vehicle)—Unmanned autonomous vehicle.

UGS—Unmanned ground-vehicle system.

UUS—Unmanned underwater-vehicle system.

UWS—Unmanned water-vehicle system.

VTOL—Vertical take-off and landing.

These are not real…yet. Less practical ideas for drone use have engaged the popular imagination.

meaning an images of oneself taken from a drone; more ominously, to be "droned" is to be assassinated via an armed forces or national intelligence service-operated drone-based missile strike.

Citizen William Merideth, Drone-Slayer

Not everyone is enthusiastic about the flying eyes being used by a very small minority of persons. In fact, in October 2015 a Kentucky man was so unhappy about the drone flying above his property line that he used his shotgun to destroy the offending aircraft. The shooter, William Merideth, claimed that the drone operator, Merideth's neighbor, violated his and his family's privacy. (The neighbor, in turn, maintained that the drone remained on his side of the property line.) When the drone operator took the drone-slayer to court seeking $2,500 in damages, the judge stated,

> *I think it's credible testimony that his drone was hovering anywhere … **[from two or three times]** over these people's property, that it was an invasion of their privacy and that they had the right to shoot this drone.* (Fieldstat 2015)

But one decision does not a precedent make. Today the shotgun diplomacy approach to drones is working its way back through the courts. Unhappy with the judge's decision in the Kentucky case, the drone operator appealed the case to the federal court in January 2016. The appellant's lawyer cited federal law (49 U.S. Code § 40103), which states that only the U.S. government has sovereignty over airspace, not a landowner (Legal Information Institute undated). The lawyer wrote that,

> *… airspace, therefore, is not subject to private ownership[,] nor can the flight of an aircraft within the navigable airspace of the United States constitute a trespass.* (Farivar 2016b)

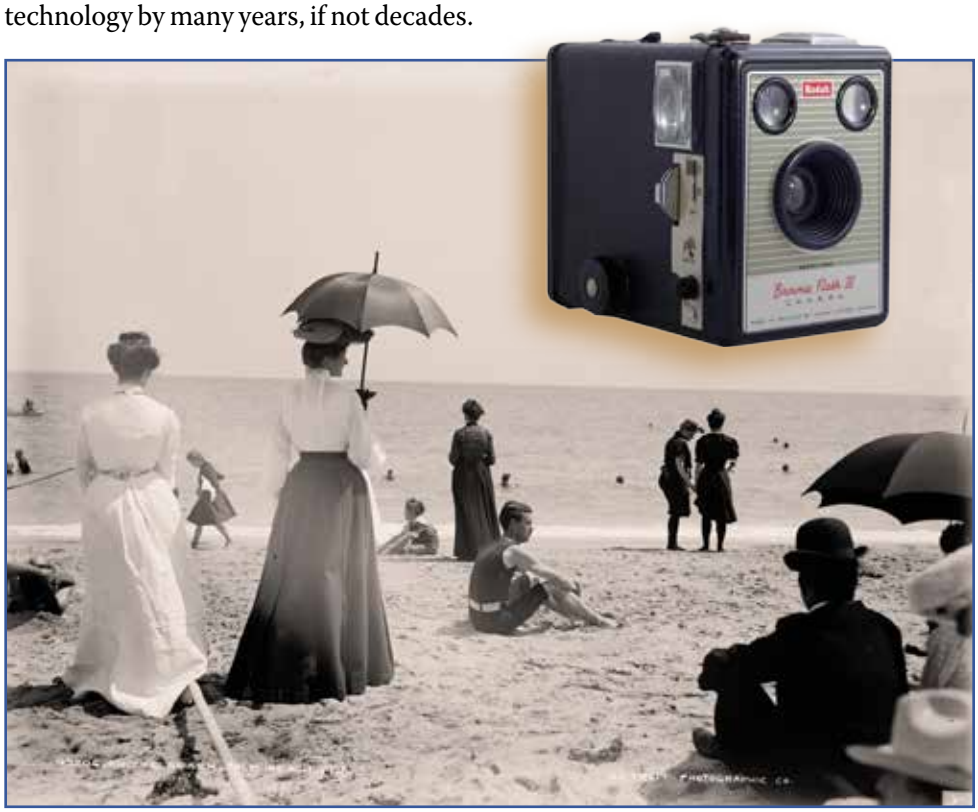
If the drone in question were operating in government territory, rather than private real estate, then the defendant would have no right at all to take action against the supposed intrusion into his property because the property in question would not truly be his own to defend.

Kodak Consumer Cameras

As it stands, personal rights against unwanted surveillance by drones are unclear. In fact, the explosion of consumer-level drones is testing the social and legal boundaries separating the public and private spheres. But drones are hardly the first example of a new technological development clashing with a society unprepared for some of its repercussions. For example, consider the National Security Agency's mass collection of telephone metadata records, the dark obscurity of which belies its far-reaching consequences. Because questions of legality are often addressed only after litigation climbs its way from the lower courts all the way up to the U.S. Supreme Court, the law is usually one of the last things to catch up with emerging technology. Settled law can lag technology by many years, if not decades.

Kodak's box camera, later models of which were known as the Brownie, is another prominent historical example of a piece of consumer technology upsetting established notions of social propriety. Generally taken to be the first consumer camera, the box camera was introduced by Kodak in 1888, when large, clumsy plate cameras were still the norm. By comparison, the Kodak box camera was small and lightweight, could be carried almost anywhere, and was operable by almost anybody. More importantly, the Kodak's flexible film format allowed the photographer to take a number of exposures before sending the unit back for development to the company in Rochester, New York.

In 1888, the camera sold for $25, and processing costs were $10, not exactly cheap for the time but accessible to well-heeled early adopters. This meant that any number of budding photographic amateurs with a little pocket money were transformed overnight into freelance documentarians on the streets.



On the beach, Palm Beach, Florida, Detroit Publishing Co., publisher, taken between 1900 and 1906. (Library of Congress Prints and Photographs Division)

The box camera allowed a new level of spontaneity to enter photography. When the earliest camera technology format was introduced in the mid-nineteenth century, photo subjects typically adopted stiff postures and donned unsmiling expressions to avoid image blur over the course of the long exposure time.

Naturally, nineteenth-century society had to adapt quickly to the proliferation of spontaneous photographs. Rumors of sneaky people clicking pictures of persons without the subjects' knowledge or consent abounded in popular culture. Fearing the "camera fiend," one resort posted a notice reading, "People Are Forbidden To Use Their Kodaks On The Beach" (Brayer 2012, 71).

But for all the popular hysteria surrounding the Kodak camera, it was so popular that the price fell to only $1 by 1890. The ready adoption of such technologies as the telephone, automobile, and cinema in a rapidly changing modern society indicates that people were prepared to become much more casual about the camera (Lindsay undated).

Surveillance

"Peeping Tom"

The ubiquity of high-resolution digital photo sensors on all but the cheapest cellular phones—not to mention the presence of closed-circuit TV surveillance cameras in major cities like New York and London—testifies to an implicit social acceptance of the likelihood of personal images being taken at any time people are in public view. Critics of drones contend that drone photography is particularly invasive because aerial photography allows for persons to be surveilled in places not normally considered public, that is, in private places, even one's home. In some circumstances, it is argued, drone photography constitutes *voyeurism*.

What can stop a plague of flying Peeping Toms? Given that drone aircraft are often sold bundled with high-resolution imagers with live streaming video, it seems reasonable to assume that some protections should exist against drones being used as mobile eavesdropping platforms.

History of Privacy in Common Law Nations

In many states it is a misdemeanor or a felony offense to capture images or sound recordings of persons unawares, in their homes, or in any other place where they would have the reasonable expectation of privacy or solitude. However, most of these laws actually predate drones and were enacted to prevent the secret recording of telephone calls. As for the issue of drone voyeurism, the lesson of the ongoing Kentucky drone-slayer affair is that the line dividing private and public in the skies is a very thin one indeed.

However, some major legislative attempts have been made to regulate intrusion of personal privacy by drone. Anticipating paparazzi sneaking up on celebrities with drones, California in 2015 attempted to enact a broad piece of legislation making it illegal to operate a drone "less than 350 feet above ground," regardless of whether anyone's privacy was being violated (Pfeiffer 2016). But the governor vetoed this broad legislation, claiming that it would impinge on the rights of legitimate commercial drone operations approved by the Federal Aviation Administration (FAA) as well as the activities of hobbyists.

More narrow legislation subsequently passed in California to the effect that a person operating a drone in violation of the airspace of private property is guilty of trespass when it is being used to capture a picture or record a private person (Peters 2015).

Drones are slowly changing what *privacy* means for the twenty-first-century legal idiom. Although the concept has a limited history in Anglo-American

According to English legend, in the 1600s, Lady Godiva pleaded with her husband, the lord of Coventry, England, to relieve the town's oppressive taxes. Growing exasperated with her pleas, he relented, provided she would ride naked on a horse through town at midday, with only her long hair as cover. Everyone in town was ordered by the Lady to stay inside their homes with the windows shuttered during her ride. But Tom the tailor, because of his curiosity, peeped through a small hole in a shutter to watch the naked lady, thereby becoming Peeping Tom.

Eavesdropping means to listen to another's conversation in secret, the term deriving from the practice of standing beneath the eaves of a house, from which the rain drops from the roof.

Voyeurism stems from the French verb "to see," and means to spy on a person unawares.

common law, in the United States a substantial jurisprudence has developed around the right to privacy for individuals since the beginning of the twentieth century. The U.S. Constitution does not explicitly guarantee a right to privacy, but the U.S. Supreme Court has ruled repeatedly that the Constitution does imply various "zones of privacy" with several constitutional guarantees. One such guarantee is the right of persons and their property to be free from unwanted public scrutiny or exposure.

Conversely, the U.S. Supreme Court has also ruled that the First Amendment protects the right of journalists to intrude upon others' personal lives from time to time; similarly, the rights of picketers have been repeatedly upheld, even if the picketing is unwanted. Thus the rights of paparazzi clicking unwanted pictures, perhaps even by drone, are protected by the Constitution. But the First Amendment does not permit trespass or other types of intrusion, such by electronic means, when there is a reasonable expectation of privacy.

An Implicit Right to Privacy?

What, after all, is privacy? With no well-developed theory for the concept in common law, the idea becomes a bit difficult to pin down in practice. Theorists of the right to privacy in the United States have cited the Fourth, Fifth, and Ninth Amendments to the Constitution as constitutive of an implicit privacy guarantee: the Fourth Amendment protecting persons from self-incrimination, the Fifth prohibiting extralegal seizures of property, and the Ninth guaranteeing other non-enumerated rights.

Today in the United States fundamental questions of privacy are at the legal root of abortion rights. *Roe v Wade* was upheld in the U.S. Supreme Court in 1973 because the issue of a pregnancy was determined to be an issue of personal privacy (Wikipedia contributors 2016b).

But even legal authorities disagree about what this right to privacy should protect. Does it prohibit trespass without a person's approval or any property trespass of property? What about the taking of personal details like those known only to a friend or lover? Is privacy guaranteed for high-profile celebrities who think they have protected themselves from eavesdroppers or paparazzi? Does a basement pot farmer have a right to privacy, even when the radiant thermal signature of her windows might indicate some less-than-legal activity to a drone-flying neighbor with an infrared camera?

Brandeis and Warren

The camera, specifically, the Kodak box camera, was a key figure in the development of American privacy rights. In 1890, future U.S. Supreme Court Justice Louis Brandeis and Boston Attorney Samuel Warren published the landmark legal article, "The Right to Privacy" in the *Harvard Law Review* (Warren and Brandeis 1890). Allegedly inspired by an incident in which journalists for a newspaper society column armed with box cameras crashed a wedding party, the article mentions the word "photograph" no less than nine times.

"The Right to Privacy" made the case for privacy protection by appealing to the more familiar personal privacy intrusions of their day: unwanted exposure through unscrupulous journalism practices. The authors wrote,

> *Recent inventions and business methods call attention to the next step which must be taken for the protection of the person [. . .]*

Furthermore, they contended that,

> *[i]nstantaneous photographs and newspaper enterprise have invaded the sacred precincts of private and domestic life; and numerous mechanical devices threaten to make good the prediction that 'what is whispered in the closet shall be proclaimed from the house-tops.'* (Warren and Brandeis 1890)

We the People of the United States

Amendment I.

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

Amendment IV.

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Amendment V.

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Amendment IX.

The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

Katz v. United States

Warren and Brandeis's argument hinges upon an implicit distinction between a "public" sphere—business, politics, life on the street, and all other situations in which a person is aware that others may see or hear them—and "private . . . domestic life." This latter domain would include what occurs among a person's family, within that person's household; proverbially, the private sphere is what goes on behind closed doors.

In point of fact, legal definitions of voyeurism and other unlawful invasions of privacy mirror this public/private cleft. Voyeurism laws vary by state and municipality, but a voyeurism offense generally constitutes watching, photographing, or videotaping a person without his or her knowledge. Such laws frequently require that the offended party has a reasonable expectation of privacy. Places such as bathrooms, bedrooms, and tanning booths can be included as locales where a person would have such a "reasonable expectation of privacy."

Because unlawful voyeuristic viewing or recording can be considered a form of unlawful search or seizure, the "reasonable expectation" criterion ultimately refers to the Fourth Amendment. This was first tested in the 1967 landmark *Katz v. United States* decision, in which the U.S. Supreme Court determined that the police violated a suspect's privacy when they recorded his conversations on a public pay phone (Wikipedia contributors 2016a). The FBI, having suspected Katz of exchanging illegal gambling tips from the pay phone, placed a recording device on the exterior of the booth.

The case turned on an interesting point: that is, if the suspect closed the glass door on the phone booth, he had the expectation of privacy, thus requiring a warrant, which the FBI did not have. But if the suspect had left the glass phone booth door open, he would have then forfeited his expectation of a private telephone call. *Katz v United States* set the precedent that the individual person has the right to expect privacy, not just his or her possessions or "things" as generally interpreted by the Fourth Amendment.

***The real question about drones is not* whether *people will get used to them buzzing through the skies, but* when.**

The *Katz* decision thereby set the legal litmus for privacy violations: (1) Does the person have a reasonable expectation of privacy? and (2) Does *society* recognize this expectation as being reasonable? In the case of a privacy protection against surveillance by drone, this second criterion is crucial. If the person being viewed by a drone through the bedroom window leaves the window curtains open, does he or she forfeit the expectation of privacy?

Historically, society slowly assimilates technological developments into its fabric. With the advent of Kodak's box camera, people became used to the possibility of being photographed at any time on the beach, boardwalk, or neighborhood grocer. More than 100 years later, society accepts the presence of selfie-taking tourists anywhere from the Santa Monica Pier to Fifth Avenue, and who would ever think of asking a bystander's consent before posting a selfie to Facebook or Instagram?

Justice William O. Douglas, taken after 1930. (Library of Congress Prints and Photographs Division)

Ad Coelum et ad Inferos

The real question about drones is not whether people will get used to them buzzing through the skies, but *when*. It will not be long before people take no more notice of a drone than they do of migrating Canada geese or a commercial airliner cruising at 35,000 feet.

However, in examining recent legal tests of consumer drone operation like the Kentucky drone-slayer case, a different thread emerges. The real question people are asking *vis-à-vis* drones is not, "Can I be sure drones won't record me changing clothes in my bedroom?", but rather, "Why should someone else's drone have any right at all to fly over my property?"

In the Kentucky case, the legal question at hand was, Who owns the airspace above a property and home? The case ultimately hinged on a question of interpretation of another post-World War II U.S. Supreme Court decision, that is, in the sky, where does private property end and the public domain begin?

United States v. Causby

In the 1946 case *United States v. Causby*, the U.S. Supreme Court rejected the property right doctrine of *Cuius est solum, eius est usque ad coelum et ad inferos*, a Latin phrase meaning, "whoever's the soil, it is theirs all the way to heaven and all the way to hell" (Farivar 2016a). This old principle of property law stated that owners have the rights not only to the plot of land but also to the air above and the ground below.

The plaintiff in the case, a North Carolina chicken farmer named Causby, sought compensation for damages to his livestock caused by the loud noise of U.S. Army Air Force aircraft on low

approach over Causby's farm. Apparently the planes caused such distress to his chickens that they flung themselves against the walls of their coops, many dying in the process. Because Causby was able to claim that the Army Air Force's operations were destroying his property's usability, he sued under the takings clause of the Constitution's Fifth Amendment.

In this decision, Justice William O. Douglas resolved the case based not on the government's taking Causby's airspace without compensation, but on the principle that a landowner "owns at least as much of the space above the ground as he can occupy or use in connection with the land," in this case, the usability of land for his chicken ranching business. This created an interesting precedent: the landowner must have "exclusive control over the immediate reaches above his property" to use the land, and this equates under the Fifth Amendment as an invasion of the surface of land itself. Furthermore, the decision extended trespass law to include nuisance takings, including the enjoyment of land (Findlaw.com undated). (Justice Douglas trivia: He also ruled that "trees have standing," or personhood, to sue in court! [Wikipedia contributors 2016c].)

Airspace Laws

The first legal interpretation of airspace rights was raised in 1783, the then-novel technology in question being the hot air balloon. Eighteenth-century jurists realized that balloon flights were technically illegal because of trespass, thus constituting the first inkling that personal rights to airspace may be a bit ridiculous. The 1926 Air Commerce Act gave the U.S. government exclusive sovereignty of airspace because every aircraft flight would be subject to suit; this law therefore generally declared that the airspace above 500 feet is navigable airspace and that these aircraft have the right of "public right of transit."

The advent of space satellites also brought the absurdity of *ad coelom et ad inferos* into a much more modern light because of the "absurdity of trespass being committed every time a satellite passed over a suburban garden" (Wikipedia contributors 2016d). The 1967 Outer Space Treaty ratified this concept in international law.

Causby is still vexing regulators. The FAA claims that the navigable airspace it regulates begins as soon as any aircraft leaves the ground; however, the 1946 decision leaves flying below 500 feet largely unrestricted, assuming that landowners have rights to the immediate airspace, for planting trees, erecting fences, raising a barn, adding a windmill, and so on.

Drones are already performing any number of tasks that are currently too dull, dirty, or dangerous for manned aircraft, and they hold the potential to unlock as-yet-unknown solutions to commercial, industrial, and scientific interactions with the built and natural landscapes.

The City of Northampton, Massachusetts, challenged the FAA regulations in 2013, citing the *Causby* decision, and passed an ordinance declaring that landowners control their airspace up to 500 feet (City of Northhampton 2013). In other words, landowners have "exclusive control over the immediate reaches" above their land. This would extend rights of privacy, trespass, and the sovereignty of the landowner.

Conclusion

Will such a patchwork of local and municipal legal provisions as those enacted in Massachusetts make life very tough for drone pilots in the United States? Although this appears quite possible in the short run, historical precedent indicates that some sort of consistent federal regulatory scheme will eventually be implemented in order to smooth over the headaches that result from inconsistent regulation. Consider, for example, the case of the satellite television industry—cable and telecommunication utilities were successful in banning satellite dishes in many parts of the country before uniform national rules took precedence.

Practical uses for UAVs are being developed daily. From cell-tower inspections (shown above) to shark patrols on the beaches of Australia (https://www.youtube.com/watch?v=THUSlo4f4mA).

Nevertheless, for all the legitimate concerns raised by the very rapid rise of the drone, one thing is clear: the genie has been let out of the bottle and cannot be put back in. Drones are already performing any number of tasks that are currently too dull, dirty, or dangerous for manned aircraft, and they hold the potential to unlock as-yet-unknown solutions to commercial, industrial, and scientific interactions with the built and natural landscapes.

In the coming years existing laws for privacy and trespass will be tested by FAA airspace regulations. The skies are a space of blankness and possibility, metonymically linked with the bird, that symbol of freedom, but officially the government's domain. How will perceptions of the skies change as more and more drones appear silhouetted against the clouds?

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