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DRONES AND JAILS

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ABSTRACT

The development of drones has been exceedingly rapid in the last few years. They can be used in many different areas of life, they are fit to solve a range of problems, in fact, in some fields they may open up new horizons. Besides their advantages, however, we must also see their downside. This article will focus on the development of these unmanned aerial vehicles and will elaborate on the regulations affecting the small-size devices, which are the most widespread. This section will be followed by the introduction of their potential use in law enforcement, with special focus on the protection of prisons. The paper will also discuss what hazards are involved in the illegal use of drones with regards to jails, and what response can be given to these new challenges.

KEYWORDS:

Airplane, drone, law enforcement, prison service, unmanned aerial vehicles

1. Introduction

Drones are unmanned aerial vehicles. Previously – primarily due to the high manufacturing and operating costs – they were deployed virtually exclusively by the military. 15-20 ago, they started to be applied also for industrial and agricultural purposes, then in disaster prevention and in law enforcement contexts.

The scope of these devices is widening, and simultaneously, their technology is improving (flight duration, altitude, weight of payload, manoeuvrability, etc.). In this paper, I will summarize what roles drones can play in the protection of prisons and what additional intelligence they are able to collect. I will also discuss in what cases these devices are fit to monitor inmate activities and thus to complement or partially or entirely substitute the surveillance provided by the prison personnel.

It is similarly important – if not more so – to assess what methods, devices and systems are available in the proximity, on the premises or in the air space of prisons to identify, monitor or prevent the activities of drones with criminal intentions. I will not only explore the technological and technical side of this issue but also the possibilities that are facilitated by the current law while also touching upon the relevant international regulations. In this article, I will discuss the development and classification of drones. I will elaborate on cases, where drones jeopardized the safety of prisons.

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2. The history of drones

The history of unmanned aerial vehicles is based mainly on Mátyás Palik's work (2013). The story of drones began even before the invention of engine-powered airplanes. Their first application is connected to wars: in 1849, Austrians deployed bomb-carrying balloons while trying to approach Venice, which was difficult to reach by land (Holman, 2009). Also in 1863, during the American Civil War, bomb-carrying balloons were in use (Werrell, 1985). As there was no control device, the wind had to do the job by blowing in the right direction and at the right speed in both cases. Should these parameters change, the chances of success would have got slimmer. In summary, it can be stated that only few of these military devices would have reached their actual targets. In the 1880s, it was a photographer who first used a camera fixed on a plane, with which he made photos from low altitude. This invention aroused the interest of the American army, and in 1898, in the Spanish-American War, they already deployed their new acquisition in the reconnaissance of the enemy's activities.

By the beginning of the 20th century, the technology had made a great step forward. Airplanes became more and more modern with a larger firing range, and simultaneously, the radio technology was also making great progress. In the early 1900s, the American Elmer Sperry stabilized a radio-controlled aircraft with the help of a gyroscope. The First World War played a crucial role in the progress of the military industry, and Sperry and his team designed a device called Kettering Bug, which was capable of carrying a bomb which would hit a given target (Hunt, 2017). Because the end of the war nigh, the device was never got to be used in combat. Between the two world wars, the technological developments were pioneered not only by the Americans but also by the Brits. Long-range radio control had made great progress by the 1930s. It was also a significant step forward that the Brits had devised an aircraft – the Queen Bee – which was able to return following its deployment. This vehicle was first called 'drone'. There were 400 such aircrafts in the Royal Navy between 1937 and 1947 (Cole, 2014).

Also the US played a vital role in the development of unmanned aircrafts. One of the most successful designers, Reginald Denny, who had immigrated to the United States from Britain after World War I, managed to sell his hobby model planes to the army. His radioplanes, RP-4 (military code: QQ1), then RP-5 (QQ2) were successful target drones. RP-5 was capable of taking off from a conventional runway, but if it ventured off outside the range of the radio system, it landed with an automatically deploying parachute. The planes were becoming more and more advanced, constantly adapting to the demands of the day. There were 9400 QQ3-type radioplanes. The last member of the series was RP-8 (QQ4), which could reach a speed of 225 kilometres/hour. These types of UAVs were present in the American army until 1948.

From the 1940s onwards, the United States Air Force also deployed drones, their exclusive manufacturer being Culver. Their first aircraft was the PQ-14 (Parsch, 2003), which could either be launched from the ground or from another airplane. The PQ-14 had a simple setup and low costs, so even after potential injuries, they could be easily repaired. World War II also encouraged technological progress. Also Germany developed an unmanned aircraft, called V-1 (Zaloga, 2005). V-1 was inaccurate, so it was primarily suited for area bombing.

Also Japan deployed unmanned aerial vehicles during the Second World War, using hot-air balloons that carried explosives (Farahmand & Webber, 2012). They applied these vehicles against the US, but out of the several thousand balloons only a few hundred managed to reach America, where they caused only minor damage.

In the Cold War, it was primarily the United Stated that designed unmanned

aircrafts (manufactured mainly by Northrop), chiefly due to the fact that two manned reconnaissance aircrafts had got shot during this period, killing the involved pilots. There was also another development path present: the radio-controlled MQM-57 Falconer (Parsch, 2007) was designed in 1955 specially for aerial reconnaissance, thus it was equipped with cameras and flashlights for images taken at night.

The most successful models in the Soviet Union were the TU-123, the TU-139, the MIG-25 Foxbat and the TU-141, while from the 1950s the People's Republic of China also made significant independent steps with the help of the Soviet Union, but after the conflict of the two countries in the 1960s, their joints ventures came to an end. The Chinese technological advances became known only after 2000.

Besides the above-mentioned world-powers, also Israel made momentous leaps from the 1970s onward. In Israel, military technological developments were constantly on board, as the country was virtually incessantly at war. With their continuous technological improvements, by the 2000s, Israel had turned into the most important exporter of UAVs in the world.

The first deployment of drones in combat was in the Vietnam War (Zaloga, 2008). Their flight time was between 45 minutes to 2 hours depending on the penetration depth. Photographic reconnaissance at daylight and at night, signal intelligence, passive interference and flyer distribution as well as radar jamming and deception were carried out by the UAVs. Their course of flying was pre-programmed, and the collected intelligence could be accessed only after the return of the vehicle. This difficulty could not be solved until 1972, when data transmission was invented, so the data became accessible practically in real time.

The Gulf War reinvented the history of unmanned aerial vehicles. From the powers of the coalition, the US, Great Britain and France applied various types of UAVs. In the combats, real time data transmission was available, even if the drones were deep in enemy territory. In the Gulf War, the fixed-winged aircrafts were successful despite their loss.

During the Yugoslav Wars, also UAVs got deployed, chiefly Pioneers and Predators. Reconnaissance was again the main activity these drones were responsible for.

After the turn of the millennium, the two major military operations were the war in Afghanistan, the related peacekeeping activities and the Iraq War. The two were waged at about the same time, and drones were deployed in both. Although large, high altitude and long flight time aircrafts were also used (Global Hawk), it is even more significant that also nano- and mini-size drones got used for the first time. The Black Hornet and the Tarantula Hawk helicopters were applied for reconnaissance in Afghanistan. The nano-size Black Hornet weighs 18 grams, including the weight of the camera. It offers its operator both manual and automatic modes of control. The general public normally pictures a similar device when they hear they term 'drone'.

The history of unmanned aircrafts is closely related to their military use and progress. Three main R&D directions characterize this path best:

– they were used as weapons being equipped with various destructive tools, which were to ruin, eliminate the enemy's resources;

– they were applied as target drones participating in air force training activities in the times of peace;

– they were used to help make leadership decisions by collecting intelligence from the air with the help of the mounted sensors.

In addition to these military uses, drones have been used for other purposes only in the last two decades. We must point out its use in agriculture: with the help of the aerial photographs of land, cultivation issues can be more easily settled. In disaster prevention, though, their application can

help stop or deal with wildland fires or floods. While dealing with flood, aerials photographs are forwarded into an IT-system, which models and calculates the anticipated direction of the flooding, thus these can form the foundation of the necessary steps. In law enforcement, it is predominantly safeguarding and the surveillance of mass events that are the most important tasks drones are to handle. They perform similar activities at private security service companies. Public media and entertainment may be further fields, as aerial photographs and video footings play a crucial role also in this branch of the economy. Transportation companies have attempted to make drones carry out goods delivery activities, but so far this has been quite rare.

3. The classification of drones and related regulations

Drones are mainly classified based on their size. The flying features entail distance from the stock transmitter and altitude. Based on the above, it can be established that the larger the aircraft, the higher-quality features it has regarding both the distance and the altitude.

Also legislators considered these criteria while setting the related regulations, even though the relevant laws differ from country to country. First, it was only military, then industrial use that determined the regulations, as the size of the aerial vehicles allowed only these uses. Consequently, at first general aviation laws were sufficient to regulate the activities of drones. Supplementary regulations were only necessary because the vehicles were unmanned. However, with the smaller sizes, drones have virtually become mass products. Because of their affordable price, they are available to anyone, in fact, they can also be constructed from parts as a DIY activity. These UAVs are so small that the legislations did not even see them within the scope of the legal acts related to aircrafts, so aviation laws did not or did not always apply to them.

In Hungary, there are no specific legal acts or provisions for drones – their operation is determined by the aviation laws. A bill was going to be adopted as of 1 July, 2017, but it did not actually come about. Although it classified drones in four categories, its provisions would have applied only to three (Cservenák, 2017): as toy-type drones below 250 grams are not affected by the law, they are considered Category 0. Their maximum flying altitude is 50 meters. They can be used during daylight without any special qualification or reporting obligation. In Category 1, there are drones below a weight of 2 kilogrammes, also with the maximum altitude of 50 meters, used exclusively during the day. In Category 2, the weight of drones is between 2 and 25 kilogrammes, and drones with an altitude higher than 50 meters already require a license just like those that fly in a residential area. Category 3 comprises all UAVs between 25 and 150 kilogrammes.

The bill would have simplified the request and issue procedure of permits, which could have been requested via a mobile application, and the aviation authority could have approved or disapproved it within 30 minutes. The police, the national defence forces and the disaster management authorities would have been informed of the issued permit.

As the law has not been passed yet, the current regulation in force is still strict: request for a permit must be submitted 30 days prior to the intended flight. As these regulations are unrealistic and outdated, flights are carried out – mostly by private people – illegally. In Hungary, drone use is regulated by Act XCVII of 1995. Although the act was amended in 2015, when the concept of unmanned aerial vehicles appeared, there is no dedicated act controlling the operation of drones as yet.

In the absence of an adequate legal background, the drone community is self-organizing. There are various associations – especially online – that have been established

for this purpose. One of these is the National Association of Drone Pilots (www.doe.hu), while on dronhive.com, following a registration procedure, the intended flight can be registered, a map gets generated which also displays other drone flight (Nádori, 2016). The site also displays an ethical code, whose observance is highly recommended to all. The rules are the following:

– Do not fly over groups or crowds of people,

– Do not fly under 25 meters over private property,

– Do not approach a person closer than 5 meters who is not aware of being photographed,

– Try to obtain local approval,

– Upon take-off and landing, provide a 3 meters times 3 meters free space,

– Notify those nearby of your take-off and landing intentions,

– Do not fly near animals,

– Do not fly in rainy, cloudy or foggy weather conditions,

– Register flights on website.

In Germany, a new regulation was introduced in April, 2017, but it entered into force only on 1 October, 2017. According to it, the following regulations apply to UAVs under 5 kilogram's of weight:

– Aircrafts under 250 grams are not bound by these terms,

– Liability insurance is obligatory for the operation of drones,

– Flights are possible only during daylight and within eyesight and not higher than 100 meters from the ground,

– All aircrafts must be marked with the name and address of the owner,

– It is prohibited to fly over groups of people and national parks,

– It is illegal to monitor law enforcement, rescue units, main roads and take-off and landing zones of airports,

– Stay well away from aircrafts, airports and airfields, at least at a 1.5 kilometres distance.

It was an important novelty that a take-off permit was necessary for UAVs over 5 kilogram's, which is issued by the local aviation association and allows drones to fly out of line of sight. For most commercial and recreational drones, however, this approval does not need to be obtained, as their weight is under 5 kilogram's. For night flights, though, this special permit must be obtained invariably for all drones.

In the United States, the operation of drones has been regulated separately from other aerial vehicles since 21 June, 2016. The rules of the Federal Aviation Administration (FAA) control the use of commercial drones. Although it is a domestic affair, the drone technology is most advanced in the US and it is there where most enterprises await the terms by which they can operate their UAVs on a daily basis. Thus, it is worth paying attention to the legal framework they act by. The greatest new achievement of the package „Part 107" (FAA, 2016) is that no pilot license is required in a traditional sense but a completely restructured qualification system has been established. The operation of drones is removed from the regulations of conventional aircrafts, and a new procedure entered into force: applicants, who are at least 16 years of age, must prove their drone operation skills by a test. This is a significant simplification, as now permits can be obtained much more cheaply, quickly and simply for commercial, educational, research or agricultural, etc. purposes. The requirements of the test are quite strict, and home delivery by drones is still not permitted, as the remote pilot may not lose sight of their drone, let alone the fact that they may perform only a single activity by the same drone at the same time. To sum it up, the new American regulations enhances the individual operation of drones but does not facilitate the existence of remotely controlled drone fleets. There are further restrictions that remain in effect: Commercial UAVs may fly only during daylight, not higher than 120 meters in

altitude, their weight including payload may not exceed 25 kilogrammes, and they cannot fly faster than 160 kilometres/hour.

Based on the above, it can be established that most states will be forced to regulate the operation of drones sooner or later, as without these, use without registration and control may result in severe problems and accidents. Although the regulations mostly cover only the flight activities, it is important to note that UAVs are predominantly equipped with cameras. Video footages and photographs, their transmission, provision and storage are regulated by a series of other legal acts. In some countries, these are attached to those regulating the operation of drones, while in others, they are connected to legal acts of e.g., data protection, copyright, etc. Regulations regarding flight over private property and prisons as well as those concerning payload represent another important question. It is clear that the related legislation will change significantly in the near future.

4. Use of drones in law enforcement in Hungary

As drones are made use of in several areas, also in law enforcement there have been attempts to exploit them. These attempts are irregular and experimental at this point, as there is neither sufficient practical experience nor an adequate legal background for the application. Some potentials involved in the operation of small UAVs were discussed by Dávid Petrétei's study published in 2015, in which the author explored the technical and legal aspects of drone use besides their law enforcement application. Police activities chiefly involve robocopters, and the main advantage they make use of is the camera, the video footages or photographs they take and transmit in real time, if the necessary technology is available. Compared to private or commercial use, law enforcement drones are equipped with night vision or thermal vision cameras too. The small aircrafts are applied mainly in the management of events, as with the help of aerial photographs or video footages, the decision-making process of those in charge is greatly supported.

Aerial footages are also well-suited for border patrol activities, as they can assist with the preparation of deployments or raids and with the mapping of the territory, whether it is an urban or a natural area. A severe disadvantage in these actions, however, is the noise made by the aircrafts, which may draw the attention of the criminals to the patrol activities.

The application of drones makes the protection of prisons, tracking as well as the localisation of missing persons easier. The inspection of accidents or crimes may also represent a special use of aerial photography.

Drones have been deployed quite frequently in disaster management, and among all law enforcement uses, this application is the most advanced since video footages and photographs are not only taken but are also processed with the help of computational and intelligent systems.

Petrétei (2015) does not focus on prison use of drones, however. In my view, there are two fields in the use of drones in jails: one of these is the protection of prisons, flying drones on a pre-programmed course and then make them return to their base. The other way of application is the surveillance of work performed by inmates. This particularly important, if the prisoners work in agriculture far away from residential areas. For this purpose, besides the photographs and footages, also an application should be employed that checks whether the inmates are located in the workplaces assigned to them. For this function, however, it is required that also the prisoners be equipped with the appropriate signal transmitters.

The legal background of drone use in law enforcement activities is not adequate in Hungary, as the same regulations apply to these authorities as to everyone else, which means that intended flights must be reported 30 days ahead to the aviation

authorities. This is clearly non-viable in the events of crime, an accident or a disaster.

In the protection of prisons, it makes a significant difference where the building is located. Drone use requires a higher degree of circumspection in densely populated areas. It can therefore be claimed that in the legislation applying to the operation of drones, their law enforcement use should be treated separately.

5. Hazards and potentials involved the use of drones in prisons

One of the greatest professional challenges that prison officers have to face is the maintenance of order and security. For this, it is important to introduce and consistently observe strict rules. The use of technological devices that prevent, detect or signal unexpected events represent part of this protection. These devices may work independently but most of the time, they form part of a more complex, computerized system. Security of prisons are jeopardized by the introduction of prohibited items as well as by maintaining banned contacts. In all jails of the world, it is prohibited to introduce sharp, pointed tools, guns, ammunition, explosives, any instruments aiding prison-break, drugs, unknown substances, medicines and performance enhancing drugs. Being in contact with certain persons may influence the outcome of the criminal procedure, may facilitate prison-break, or prepare further crime. There are numerous rules, tools, methods to prevent these two hazards, for example, double gates, metal detector gates, X-ray screening devices, mechanical obstacles, such as barbed wire fences, etc. The appearance of drones, however, represent a new challenge to the personnel of prisons, as the accomplices of criminals also apply the new technologies. Both in Europe and in the US there have been incidents when contrabands were carried to prisons by drones, or the small UAVs simply made video footages or took photographs in order to map the situation, structure, degree of security and the applied safety measures of the jails. Already very light and very small drones, which are legally considered as toy – are able to carry mobile phones weighing only a few decagrams, SIM and data storage cards of only 1-2 grams, or only a few grams of drugs or medicine, which may cause serious problems. Just to name a few incidents in the last few years:

- In 2013, in the Canadian Gatineau Prison, a flying drone was spotted, but the guards could not find either the drone nor its payload, nor its remote pilot (Russon, 2013).

– In 2014, in the US state of South Carolina, a remote-controlled drone tried to smuggle marihuana, cigarettes and mobile phones into a prison for the inmates, but since the small aircraft was overloaded, it did not manage to fly over the prison fence and crashed (Khaw, 2014).

– In November, 2016, banned items were taken by drone to an inmate in a cell on the 4th floor of the Danish Nyborg prison to assist his prison-break (White, 2016). The small UAV carried two mobile phones, a saw blade and nails, and successfully put these items down in the institution then disappeared. The payload was confiscated by the prison guards, but the drone did not get captured and its sender was not found.

– In 2017, there was an attempt to smuggle a mobile phone into Pitești Prison in Romania by drone, but the guards captured the small aircraft since they had taken note of the noise the rotor made.

In Hungary, there has not yet been a specific case of smuggle, but drones have flown over perimeter walls, in fact, in some cases, action was taken, and the inmates were made to enter the building and leave the courtyard. Later, following the consultation with the authorities, it turned out that the remote pilot of the drone had a permission to his disposal to take aerial photos of the city. Nevertheless, protection procedures against such intrusion must be devised and implemented. Protection

measures, however, raise legal questions in the first place: who can prevent the flight of a drone and how? By doing so, can they harm the drone or any other object, injure a person or an animal? Can the prevention of the flight of a drone be justified? What happens, if we attempt to take action against a drone which is operated with a permission? It is not easy to answer these questions. It can well be that an action taken results in a court trial, and due to the many unsettled legal issues, the outcome can by no means be predicted. Self-defence against drones can have three different outcomes: the drone is forced to return to its stock base, it is forced to land at a certain point or a solution is found which results in damage or the destruction of the UAV. As far as prison safety is concerned, the ultimate goal is that no drone could take photographs while flying over the premises or introduce any banned items into the building. There are various solutions: placing some kind of wire or plastic net on the top of the open sections of the building. This could work only with smaller areas and would prevent banned items from entering but would not prevent the drone from making videos or photographs. Another possibility would be to launch another „protective" drone over the intrusive drone, which would drop a net over it and thereby would bring about the crash of the intrusive drone.

In some cases, eagles are trained against intrusive drones. Although the idea may sound odd, this idea has been serious considered with regards to the protection of the Budapest Parliament and its direct public surroundings against drones. This solution has been tested and applied by the Dutch police force, and the French army. But barely a year after the deployment of the eagles, at the end of 2017, the project was dismissed in the Netherlands (Pieters, 2017). In France, though, the eagles are still employed, and also in Switzerland, the Geneva police have recently begun the training of eagles.

Another way of self-defence is the installation of an electromagnetic system, with the military term: 'electromagnetic countermeasures'. These are devices releasing guided electromagnetic waves; they could also be considered guns. Several companies manufacture these weapons, which are able to force an aircraft – even from as far as 2 kilometres – to land or return to its take-off site while disrupting the communication with its remote pilot. It was a basic requirement during the design phase of this electromagnetic weapon that the drones would not be harmed during the action. The use of these electromagnetic counter-measures, however, raise the exact same legal issues as the use of drones.

It seems to be a more effective solution, if an electromagnetic shield is created around facilities, in this case, the premises of a prison. The operation principle of such a system is based on the observation of radio frequency signals which refer to the proximity of drones. Should the system detect such a signal, it starts interfering with it, which will disrupt the communication link between the UAV and its remote pilot, who will then lose control over the aircraft. In the event of interference, the drone will switch to 'return to home' mode, will land or will start hovering.

Another method of reconnaissance may be the tracking of acoustic signals: the detection of the noise made by UAVs. Naturally, these acoustic detection systems must be tuned appropriately, as their operation can easily interfere with the data transmission of other wireless systems, such as WiFi, or Bluetooth. These devices require a massive hardware and software background.

In my opinion, from the above-listed possibilities, the last technology could best fit to protect prisons against drones, as it could develop into a complex system and would require little human interference. Also Péter Hell came to the same conclusion in his study on the protection of facilities against drones (Hell, 2017).

The first such disruptor sstem was introduced first at Les Nicolles prison on

Guernsey in the UK in 2017 (Bishop & Di Salvo, 2017). The device creates a 600m shield around and above a prison which will detect and deflect the remote-controlled aircrafts. The shield contains a series of "disruptors", which are sensors to jam the drone's computer and block its frequency and control protocols. After the exploration and analysis of these international practices, a well-functioning system could be devised in Hungary and other states.

6. Conclusion

The history of unmanned aerials vehicles goes back to the mid-19th century. Their development was parallel with that of airplanes. In this paper I have discussed the major milestones. Until quite recently, however, only very few people had any knowledge of these devices. For a very long time, their use was restricted to the military, later industrial and agricultural uses. In the last few years, though, drones have undergone a tempestuous boom on the market, and today they are available virtually to anyone. Similarly to many other technological advances, the related legislation lags much behind the reality nearly all over the world.

Drones are exceedingly useful in many different areas of life, ranging from entertainment to law enforcement applications, but as many other innovations, they also cause problems and hazards that we did not have to face before their existence. One of these is their threat to prison security. Appropriate solutions must be devised for new threats, and in my paper I strove to present the solutions which are applied internationally today. I also discussed which solution I would find most optimal based on my related expertise. It is crucial, however, that not only the technology should be created but also an internationally harmonized legal background to regulate the operation of drones in the individual states. Simultaneously or subsequently, a protective regulation system and legal sanctions must be adopted against illegally operated drones. Protection against drones and the management of various incidents does not end here, however, as in addition to legal and technological measures, also the job responsibilities of the law enforcement staff – the prison personnel – must be extended accordingly. The work process must include the continuous monitoring of flying permits as well, as this will enable the authorities to distinguish between legal and illegal activities.

New challenges call for new solutions. Today, drone activity is this kind of challenge, which law enforcement, more specifically prisons, have to face not only in Hungary but all over the world. Therefore, our solutions must be technologically and legally well-grounded and feasible in daily practice.

REFERENCES

Bishop, R., & Di Salvo, M. (2017). *British prison becomes first in world to use anti-drone 'disruptor' shield to stop inmates smuggling in contraband*, available at: https://www.mirror.co.uk/news/uk-news/british-prison-becomes-first-world-10433402, accessed on: 22. April 2018.

Cole, C. (2014). *Rise of the Reapers: A brief history of drones*, available at: https://dronewars.net/2014/10/06/rise-of-the-reapers-a-brief-history-of-drones/, accessed on: 11 March 2018.

Cservenák, Z. (2017). *Jön a magyar dróntörvény* (Come the Hungarian drone law), available at: https://goo.gl/oPfUbd, accessed on: 22. April 2018.

Federal Aviation Administration (FAA) (2016). *Summary of small unmanned aircraft rule (PART 107)*, available at: https://www.faa.gov/uas/media/Part_107_Summary.pdf, accessed on: 23. April 2018.

Farahmand, A., & Webber, M. (2012). *Anti-aircraft mine & Intercontinental launching balloon bombsthrough jet stream*, available at: https://goo.gl/9sdZsK, accessed on: 11 March 2018.

Hell, P. (2017). Drone protection systems in facility management. *Hadmérnök, XII. 3*, 37-47.

Holman, B. (2009). *The first air bomb: Venice, 15 July 1849*, available at: https://airminded.org/2009/08/22/the-first-air-bomb-venice-15-july-1849/, accessed on: 11 March 2018.

Hunt, D. (2017). *World War 1History: The Kettering Bug – World's First Drone*, available at: https://owlcation.com/humanities/World-War-1-History-The-Kettering-Bug-Worlds-First-Flying-Bomb, accessed on: 11 March 2018.

Khaw, C. (2014). *Drone crashes while smuggling weed into maximum security prison*, available at: https://www.theverge.com/2014/8/1/5958101/drone-contraband-smuggling-south-carolina, accessed on: 25. April 2018.

Nádori, A. (ed.) (2016). *The Drones Book*, Second Edition (Hungarian Publishing). Budapest: Kossuth Kiadó Zrt.

Palik, M. (2013). *A pilóta nélküli repülés rövid története*. Budapest: National University of Public Service.

Parsch, A. (2003). *Directory of U.S. Military Rockets and Missiles – Early Missiles and Drones*, available at: http://www.designation-systems.net/dusrm/app1/q-14.html, accessed on: 11 March 2018.

Parsch, A. (2007). *Directory of U.S. Military Rockets and Missiles – MQM-57*, available at: http://www.designation-systems.net/dusrm/m-57.html, accessed on: 11 March 2018.

Petrétei, D. (2015). A drónok kriminál technikai és rendészeti felhasználása (Criminal technological and law enforcement use of drones), *Magyar Bűnüldöző, 2015/1-3*, 70-81.

Pieters, J. (2017). *Dutch police drops drone-hunting eagles, project*, available at: https://nltimes.nl/2017/12/07/dutch-police-drops-drone-hunting-eagles-project, accessed on: 26. April 2018.

Russon, M. (2013). *Drones are being used to smuggle drugs into Canadian prisons*, available at: http://www.businessinsider.com/drones-are-being-used-to-smuggle-drugs-into-canadian-prisons-2013-11, accessed on: 25. April 2018.

Werrell, K.P. (1985). *The Evolution of Cruise Missile*. Alabama: Air University (AU), Maxwell Air Force Base

White, M. (2016). *Drone used to smuggle cell phones and saw blades into prison by flying it through 4th-floor window*, available at: https://goo.gl/jgwoYS, accessed on: 25. April 2018.

Zaloga, S. (2005). *V-1 Flying Bomb 1942–52*. Oxford, UK: Osprey Publishing.

Zaloga, S. (2008). *Unmanned Aerial Vehicles Robotic Air Warfare 1917-2007*. Oxford, UK: Osprey Publishing.