

Chapter 14

Unmanned Naval Vehicles and the Law of Naval Warfare

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Abstract This chapter examines the adequacy of the existing law of the sea and law of armed conflict in regulating and assessing the employment of unmanned vehicles in maritime operational contexts. On the basis of a general assumption as to the enduring relevance and utility of existing law in addressing the challenges of new technology in the maritime domain, the chapter focuses upon unmanned vehicles as a case study of how existing law can meet the challenge of describing and regulating the military applications of new technology at sea. To this end, the analysis concentrates upon two talismans fundamental to defining and understanding this relationship: (1) the status of unmanned vehicles at sea, most particularly in terms of their legal personality and access to flag state immunities; and (2) the poise and positioning of unmanned vehicles at sea in terms of the legal affront they may generate.

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14.1 Introduction

There can be no doubt that law exercises many forms of limitation and regulation over the planning and conduct of maritime operations. But it is equally important to recognise that law is also an important weapon in the conduct of maritime operations. This is perhaps most eloquently evidenced in the juxtaposition of two highly influential treatises on the factors affecting the conduct of operations at sea. Alfred Thayer Mahan's classic, *The Influence of Sea Power upon History*,¹ is generally considered to be the naval equivalent of von Clausewitz's *On War*,² one of the foundational texts of the discipline, and consequently the subject of significant reference, critique and exegesis. The other side of this coin is D P O'Connell's iconic 1975 study, *The Influence of Law on Sea Power*,³ an overt genuflection to Mahan's classic on maritime strategy. Both scholars—O'Connell as a celebrated scholar of international law who was a Reserve Officer in the Royal Australian Navy, and then the Royal Navy; Mahan as an active service United States (US) Naval Officer who was also an internationally recognised strategic theorist—were sensitive to the impacts of law upon the projection and use of sea power. O'Connell, for example, describes the role of the law of the sea and the law of naval warfare in securing the delay imposed upon the German pocket battleship *Graf Spee* in Montevideo after the battle of the River Plate on 13 December 1939. Clever use of the legal opportunities inherent in the situation allowed for a deception operation and mustering of forces such that *Graf Spee* was scuttled by her own Ship's Company on 17 December 1939, rather than steamed out to what they thought would be certain destruction at the hands of (what they had been led to believe was) a much stronger British force laying in wait. This was a battle, O'Connell observed, where 'the points of law arising in the situation were weapons in the overall armoury, to be used adroitly in combination with naval force to bring the event to the desired end'.⁴ Mahan, as a member of the US delegation to the Hague Peace Conference in 1899, was a decisive influence in the US decision to cast the only negative vote on the proposal to prohibit use at sea of projectiles designed to spread asphyxiating or deleterious gases, which would—in his view—have limited, for no justifiable reason or outcome, the US Navy's ability to threaten, fight and win at sea.⁵

The relationship between law and capability at sea is thus fundamentally bivalent—regulation is also empowerment; limitation can be weaponised. The declaration of a 12 nautical mile territorial sea offers a regulatory gain for the coastal state—no foreign power can send its warship through that zone to conduct intelligence collection operations. But by the same token, as technology allows,

¹ Mahan 1890 (1987).

² Clausewitz 1832 (1976).

³ O'Connell 1975.

⁴ O'Connell 1975, p. 39.

⁵ Mahan 1899; See also, Livezey 1981, pp. 272–274.

that 12 nautical mile line in the sea also delineates for other states a line from which they have an unimpeachable right to collect intelligence on that coastal state. Thus the same limitation or regulation is weaponisable in the service of two diametrically opposed interests: 12 nautical miles preserves coastal state security from intelligence collection and surveillance; 12.1 nautical miles assures other states' access to it.

This short contribution to the debate will focus briefly on two discrete issues cast up by unmanned vehicle technology and its use in the maritime domain: one related to the definition; and the other related to a specific operational issue. Before doing so, it will be necessary to lay out a fundamental assumption of this chapter, which is that the power of general principles actually mitigates—substantially—the need to develop detailed legal regimes of governance and regulation (or at least can very adequately serve this role until we develop a fuller grasp of the practical issues that arise). This assumption drives the author's assessment of the more specific issues then considered. Only with this admission made may the author then move to assess two specific unmanned vehicle maritime operations law issues amongst the armadas of such issues worthy of detailed exploration. It will not, for example, examine how unmanned vehicles might access and employ the right of hot pursuit.⁶ Nor will this chapter inquire into the extent to which naval warfare may have already entered the autonomous unmanned combat underwater vehicle age with self-propelling smart naval mines and torpedo mines which can travel to a designated site, identify a specific target on the basis of its acoustic signature, assess whether it has achieved the right combination of characteristics to allow prosecution of the target, and then give itself the go/no go order.⁷ This chapter will focus upon two of the more general, contextual issues that unmanned vehicles present in the context of maritime operations law: their legal status; and the poise and positioning of maritime forces.

⁶ *Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994) ('*LOSC*'), Article 111.

⁷ The US Navy's CAPTOR mine is delivered to its site by torpedo. It then moors and awaits the acoustic signature of a hostile submarine, having been programmed to ignore the acoustic signatures of friendly submarines, and of surface ships. Once it detects the required acoustic signature, it launches another torpedo which targets the hostile submarine. This technology has been deployed since 1979: see Military Analyst Systems 1998a. The US Navy has also deployed (since 1983) a Submarine Laid Mobile Mine, which will navigate itself to its predetermined location (for example in an area where it is too shallow/exposed/dangerous to attempt to lay the mine by submarine, ship, or aircraft) and then rest on the bottom awaiting a specified surface target: see, Military Analyst Systems 1998b. It is highly likely that related technology has advanced radically in the last three decades.

14.2 Fundamental Assumptions

Clearly, specific technologies can (and almost always do) precede the discrete legal regimes necessary to provide the more nuanced and detailed governance required by innovation—the 1977 *ENMOD Convention*⁸ is perhaps a notable exception to the rule, as is the system established to regulate disposition of the wealth expected to accrue from deep sea-bed mining.⁹ But what can be missed in the focus upon detail, or the search for analogies, is the power of general principles to offer sufficient governance during the inevitable hiatus that ensues whilst the impacts of a technological development are yet to be fully understood. Only in this way can we come close to ensuring that any ultimately developed regime of detailed regulation is practical, empirical, sensible, and experientially based. This point is made because it is sometimes lost in the heat of debate over the issue of, for example, Central Intelligence Agency (CIA) drone strikes against Taliban commanders and fighters in Pakistan. These strikes are governed either by the law of armed conflict or the law enforcement paradigm—the fact that the weapon is a drone, as opposed to a detachment of Special Forces, does not mean that different law is applied, or that new law is required. Both agents are governed by the same legal penumbra: is it a law of armed conflict or law enforcement based action?; what is the status of the ‘shooter’?—whether the CIA controller is a ‘combatant’ in the same way as the Special Forces shooter is neither a new question, nor one that only arises in relation to unmanned combat aerial vehicles; was there a breach of territorial integrity (in some situations, a legally acceptable and defensible action)?—whether the breach was of airspace by an unmanned combat aerial vehicle, or crossing the border on land by a Special Forces force element, the issue is fundamentally the same in legal terms; was the target properly identified?—whether pattern of life observations were made by Special Forces eyes on, or by

⁸ *Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques*, 18 May 1977, 1108 UNTS 151 (entered into force 5 October 1978) (*‘ENMOD Convention’*). It is important to distinguish the focus of the *ENMOD Convention* from the environmentally related provisions in other law of armed conflict instruments—As Adam Roberts and Richard Guelff note in their introduction to the *Convention*, ‘Articles 35(3) and 55(1) of 1977 Geneva Protocol I prohibit the employment of methods or means of warfare which may be intended or expected to cause “widespread, long-term and severe damage to the natural environment”’. This...provision is worded slightly differently from the *ENMOD Convention*...and has a different purpose: it is concerned with damage *to* the environment, whatever the weapons used. This is distinct from the manipulation of the forces of the environment as weapons, which is the central concern of the *ENMOD Convention*’. See, Roberts and Guelff 2000, pp. 407–408.

⁹ *LOSC*, pt. XI (*‘The Area’*). See, for example, Article 160(2)(f)(i) relating to the powers and functions of the Assembly: ‘[t]o consider and approve, upon the recommendation of the Council, the rules, regulations, and procedures on the equitable sharing of financial and other economic benefits derived from activities in the Area...taking into particular consideration the interests and needs of developing States and peoples who have not attained full independence or other self-governing status’.

unmanned combat aerial vehicle high resolution cameras, the applicable law of armed conflict tests remain the same. None of these fundamental legal questions, and the general principles which govern their resolution, is displaced or nullified in application because the lethal effect was delivered by an unmanned combat aerial vehicle controlled from outside Pakistan, as opposed to Special Forces sniper in the hills above the qala.

The author remains convinced that the general principles of the law of armed conflict and of the law of the sea, for example, are currently sufficient to provide the required level of governance over use of unmanned aerial vehicles, unmanned surface vehicles, and unmanned underwater vehicles in the context of maritime operations. In all relevant respects, an unmanned surface vehicle, unmanned underwater vehicle, or ship-launched unmanned aerial vehicle (and their weaponised variants) is a means or method of warfare (from a law of armed conflict perspective) and a vessel, aircraft or system (from a law of the sea perspective) to be governed in the same way as a warship, military aircraft, weapons system, and/or a munition. Similarly, its operator is a human being to be governed in the same way as the Commanding Officer, pilot, weapons guidance officer, or forward tactical controller who plays a role in its situational disposition and projection of force. So long as there is: (1) a traceable path of control over and responsibility for its employment (as distinct from any requirement for there to be an identifiable individual to whom criminal liability is attributed for an unlawful consequence, and who is subject to criminal sanction as a result—this is a different concept); and (2) recognition of the scope for error or mistake; then the law is (and, really, should be) fundamentally the same as for existing and pre-cursor capabilities.

Only when the line of control and/or responsibility becomes uncertain or unidentifiable at law does the governance offered by general principles potentially become fundamentally inadequate.¹⁰ Even in this situation, however, it is not at all clear whether simply because an applicable general principle cannot clearly identify the criminally liable individual(s), it then necessarily follows that there is no responsible individual. Just because—in a future of completely autonomous unmanned combat surface vehicles—there is no individual who physically pushes the required button, which launches missiles at a truck ashore carrying refugees, it does not mean that there is no line of responsibility. Direct causation is but one way to trace degrees of responsibility. The fact that no court has yet determined the apportionment of responsibility, in the context of the law of armed conflict, for example, between the software and hardware designers and maintainers, the data enterers, the intelligence analysts who set the parameters, and the overall mission commander, does not mean that it cannot do so on the basis of the law we currently have. One component of the law of armed conflict doctrine of command

¹⁰ Heyns 2013.

responsibility for war crimes (and similar violations), for example, is the duty to inquire.¹¹ This certainly applies after an incident (such as with an unmanned combat vehicle including an autonomous unmanned combat vehicle) and requires the Commander to make adjustments to, or to take relevant measures in relation to, the command, control, disposition, and administration of his or her force (or a component of it) as a consequence of those inquiries. It is inconceivable (in my experience, at any rate) that the first casualty incident involving a fully autonomous unmanned combat vehicle will not be rigorously investigated, and that lessons learned will not be consciously developed and incorporated into doctrine, training, and command consideration at the operational and tactical levels. After this, the door to command responsibility will clearly be open.

But even before we get to this stage, the law of armed conflict prescribes other obligations—carrying with them susceptibility to criminal sanction in the wake of non-compliance—which will also directly affect the employment of autonomous unmanned combat vehicles, and thus potential criminal liability for the consequences of such employment. For example, the autonomous unmanned combat vehicle will have been subject to a weapons review under Article 36 of *Additional Protocol I* well in advance of any operational employment—a process specifically designed to assess the weapon and weapons system, in the light of test and evaluation data, against both the general principles of the law of armed conflict, and any relevant specific prohibition or governance regime within the law of armed conflict.¹² Two of the key criteria that the expected operation of an autonomous unmanned combat vehicle will need to be assessed against are its capacity to discriminate, and whether, in situations of expected employment, it creates disproportionate consequences. If an autonomous unmanned combat vehicle is brought into service after such a review, but does not behave as anticipated, then this will necessitate further evaluation and review, and a consequent

¹¹ See *Rome Statute of the International Criminal Court*, 17 July 1998, 2187 UNTS 90 (entered into force 1 July 2002), Article 28. For discussion, see, for example, UK Ministry of Defence 2004, para 16.36.6 (‘Actual knowledge is clearly sufficient, but it is also sufficient if the commander “had reason to know”. This has been described as “where he had in his possession information of a nature, which at the least, would put him on notice of the risk of such offences by indicating the need for additional investigation in order to ascertain whether such crimes were committed or were about to be committed by his subordinates”.’). The quote is from the *Prosecutor v Delalic and Others (Celebici Case)*, Judgment of the International Criminal Tribunal for the former Yugoslavia, Appeals Chamber, Case No IT-96-21-A, 20 February 2001, paras 223, 239. Similarly, see, Solis 2010, p. 404 (‘The commander’s liability is not that of an aider and abettor. Instead, it is grounded in his own negligence in acting or not acting...; the commander either failed to anticipate the criminality when she possessed specific facts that should have led her to act, or she failed to prevent criminal acts of which she knew, or under the circumstances, should have known, or she failed to take corrective action as to crimes already committed’).

¹² *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)* 8 June 1977, 1125 UNTS 3 (entered into force 7 December 1979), Article 36 (‘*Additional Protocol I*’). For details, see, Chap. 4 by Copeland in this volume.

duty (and thus avenue to criminal liability) with respect to the future employment of that system.

Similarly, each commander who directly utilises an autonomous unmanned combat vehicle will still need to consider, on a case-by-case basis, the legality of the employment of that system in a particular targeting mission. To do this, the Commander is required to take into account information regarding the known parameters, performance and foibles of an autonomous unmanned combat vehicle and any strategies for risk mitigation, as a component of his or her 'precautions in attack'.¹³ The fact that a system is autonomous does not relieve the employing commander from the obligation, for example, to 'do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects'.¹⁴ If the Commander's response is that he or she decided to employ that autonomous unmanned combat vehicle on the basis of accumulated wisdom as to its operating parameters in terms of capacity to distinguish, its risk mitigation penumbra with respect to this capacity, and the tactical situation, then any unanticipated outcome needs to be assessed against this background. The fact that the weapons system was autonomous does not relieve commanders of their obligation to assess and take precautions in attack. The Commander is also under an obligation to 'take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimising, incidental loss of civilian life, injury to civilians and damage to civilian objects'.¹⁵ All other things being equal (although they rarely are), if the Commander has two feasible options available to prosecute a target—an autonomous unmanned combat vehicle and a 'manned' system—then he or she must make a reasoned, reasonably accountable (even in the sense of criminal liability) decision as to which means to employ, attending to the obligation to choose that option which offers the best prospects of avoiding, or minimising, incidental injury or collateral damage. If, for example, the autonomous unmanned combat vehicle has a strong record, in similar circumstances, of better discrimination than the manned system, then this must factor into the Commander's decision. Similarly, if the autonomous unmanned combat vehicle has a poorer record, in similar situations, than the manned system, then this will likewise weigh heavily in the decision. The fact that one option is autonomous does not negate the Commander's preliminary responsibility—and potential liability—for the decision to employ it in the first place.

It is vitally important to remember that the law of armed conflict, in particular, is readily cognisant of the fact that a 'wrong' consequence (for example, when a missile hits a refugee vehicle which the autonomous unmanned combat surface vehicle had identified as a military vehicle) does not always mean that criminal liability will be allocated to someone involved in the action. Mistakes in inputs, errors in judgement, flaws in systems, the unpredictability of intervening events,

¹³ *Additional Protocol I*, Article 57.

¹⁴ *Additional Protocol I*, Article 57(2)(a)(i).

¹⁵ *Additional Protocol I*, Article 57(2)(a)(ii).

and importantly, the unanticipated cumulative effect of a series of such events (the concept of holes in a series of slices of Swiss cheese unexpectedly lining up to allow the consequent ‘passage through’ to manifestation) are acknowledged mitigators of criminal liability in the law of armed conflict. These are factors which may blur, soften, or even break otherwise clear lines of control or responsibility such as to alleviate criminal liability. If the law already recognises situations where responsibility is so diffuse as to preclude allocation of criminal liability to one or more selected individuals then the worst case scenario of a tragic consequence of an action by an autonomous unmanned combat vehicle, where it is simply not possible to allocate criminal liability to a human agent somewhere in the causative matrix, is already well contemplated at law.

The obvious concern is that diffusion of responsibility to the point of inability to impose criminal liability is a recipe for impunity. But two factors should be borne in mind when considering this extremely serious and important caveat. First, in some situations, impunity will clearly be the result, but impunity as a consequence of blurred responsibility is already a consequence known to law,¹⁶ not one that will arise for the first time when an autonomous weapon system kills civilians. Second, where the blurring of responsibility was the result of a conscious effort to generate impunity for the act, there are other paths to criminal liability—conspiracy, complicity, aiding and abetting, common purpose, and so on.¹⁷ Just because no court has yet adjudicated on the issue, on the basis of currently existing general principles, in relation to an autonomous unmanned combat vehicle, it does not automatically follow that it will be unable to do so.

Finally, there is always an inherent risk that in developing and legislating new law in place of an already applicable general principle, we will see the regulatory regime actually watered down, or the process generating such disagreement that opportunists will seek to exploit the grey area thus created—a backward step from the application of sound general principles. There can be no doubt that the persistent surveillance on target of an unmanned combat air vehicle, for example, can radically enhance our capacity to apply the law of armed conflict—the longer the pattern of life observation we can achieve, the greater the potential for certainty and discrimination in targeting. Capacity to remain on station for significantly longer periods allows for less time sensitivity and/or own force exposure to increased risk levels in that the unmanned combat air vehicle can wait for the most opportune moment (with all the possibilities this offers for reducing collateral damage and incidental injury), rather than having to take a more damaging opportunity before the manned weapons system or unit has to come off task. Clearly, this capability means that opportunities to target are increased, but if the

¹⁶ For example, certain proceeds of crime laundering schemes, which carefully and consciously exploit a series of ‘lined-up’ gaps in the law, or banking laws which allow identity obfuscation practices.

¹⁷ See, for example, *Criminal Code 1995* (Cth) pt. 2.4: Extensions of Criminal Liability.

ultimate consequence is that more fighters die, but less civilians die, then this is a legally, politically, and operationally defensible outcome.

If we rush to limit the capacity to utilise unmanned vehicles, and more particularly unmanned combat vehicles, in military operations on the basis of what may currently be determined to be unacceptably high rates of collateral damage and incidental injury, we may actually end up creating a legal anomaly as the technology becomes more capable and discriminating. This is not an unknown result: the 1899 prohibition on the use of flattening and expanding rounds against enemy forces during armed conflict,¹⁸ was based on the effects of the British Mk IV dum-dum bullet. But the prohibition fundamentally hinges on a technical description (as opposed to an effect). In the intervening century, technology has radically refined both flattening and expanding rounds, and the means to deliver them with greater accuracy, to such a degree that a related round is now the preferred round for policing. This is because it has better immediate stopping power than many full metal jacketed (standard military) rounds, and tends to stay in the body of the target rather than passing through and creating risk to bystanders (as full metal jacketed rounds can). Yet the law of armed conflict, on the basis of a 110 year-old proscription based on very different technical capabilities, ensures that such rounds cannot be used by military forces against the enemy. The very type of round used by many police services because it lessens risk to bystanders, is prohibited to military forces in situations where it would serve exactly the same beneficial role—stop the fighter, but reduce risk to civilians. Perhaps a better result may have emerged from a continuing application of the existing principles found in the law of armed conflict (such as the prohibition on causing unnecessary suffering to combatants), rather than a rush to create a detailed technical proscription. This would have given the international community the time to make a more informed assessment as to what sort of limitation might best serve and reflect the myriad principles and considerations at play. Perhaps, for the very same reason, we ought to pause long enough to look at potential unintended consequences before rushing to further, more detailed prohibitions in relation to, for example, unmanned combat vehicles. This is not to say that further, more detailed regimes of governance will not be required; rather it is to say that such regimes should be empirically based—that is, developed once the international community has a better handle upon what new or novel problems the technology actually presents in the course of operational employment.

¹⁸ *Hague Declaration (III) on the Use of Bullets Which Expand or Flatten Easily in the Human Body*, 29 July 1899, 187 CTS 459 (entered into force 4 September 1900) (*'Hague Declaration III'*), reproduced in Roberts and Guelff 2000, pp. 64–65.

14.3 Status

In assessing the capacity of existing law to provide governance over unmanned surface vehicle, unmanned underwater vehicle, and maritime unmanned aerial vehicle capabilities, it is important to first determine their legal status. The issue of independent unmanned aerial vehicle status is dealt with elsewhere in this volume,¹⁹ and thus this chapter will focus only upon unmanned surface vehicles, unmanned underwater vehicles, and their organic systems (which may include unmanned aerial vehicles). This is because differently nuanced regimes apply to vessels (and aircraft) entitled to ‘sovereign immunity’.

The legal concept of ‘warship’ gained explicit parameters in Articles 2–6 of the 1907 *Hague Convention (VII) Relating to the Conversion of Merchant Ships into War-Ships*.²⁰ In essence, the cumulative effect of these provisions requires that a warship: ‘bear the external marks which distinguish the warships of their nationality’ and be commanded by an officer ‘in the service of the State and duly commissioned by the competent authorities’ and whose ‘name must figure on the list of the officers of the fighting fleet’; ‘the crew must be subject to military discipline’; the vessel ‘must observe in its operations the laws and customs of war’; and for merchant vessels converted to warships, the state ‘must, as soon as possible, announce such conversion in the list of warships’, thus implying that all warships must appear on such a list.²¹ This definition is essentially (although not in all respects) now replicated in Article 29 of the *LOSC*:

For the purposes of this Convention, ‘warship’ means a ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the State and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline.²²

Before looking to the independent status of unmanned surface vehicles and unmanned underwater vehicles, it is important to recognise one key distinction which colours what follows. This distinction is that a ship- or submarine-launched unmanned surface vehicle or unmanned underwater vehicle, which is controlled from a mother ship, is in fact an extension of that ship in that it is a system of that ship and thus holds a partially reflected status, rather than an entirely independent status. This is not an unusual concept in the law of the sea, and can equally apply to a manned system. For example, it is clear under the *LOSC* that a ship exercising rights of navigation, and indeed an aircraft exercising rights of overflight, in the course of archipelagic sea lanes (ASL) passage under Article 53, must proceed in

¹⁹ See, [Chap. 12](#) by Henderson and Cavanagh in this volume.

²⁰ *Hague Convention (VII) Relating to the Conversion of Merchant Ships into War-Ships*, 18 October 1907 205 CTS 319 (entered into force 26 January 1910).

²¹ Venturini 1988, pp. 111–128.

²² *LOSC*, Article 29.

'normal mode solely for the purpose of continuous, expeditious and unobstructed transit'.²³ Thus a warship, or an independent aircraft (for example a Maritime Patrol Aircraft), must proceed expeditiously through the ASL. The implication is that the vessel/aircraft should not (unless incidental to normal navigation or as caused by some form of force majeure) loiter in the ASL, or make radical, delaying alterations in course (for example, in a patrolling pattern) during ASL passage. The warship, as with the maritime patrol aircraft, should essentially enter the ASL at one point and then proceed to its exit point from the ASL without undue delay. However, a warship's organic helicopter, whilst it certainly has an independent identity for certain purposes, is for the purposes of ASL passage simply a sensor system of the warship. This means that it can be deployed as a sensor out from the warship (for example, to visually identify the ship which the warship's radars detect ahead over the horizon), and then to return to the warship, without offending the requirements of ASL passage that apply to the warship itself (or to the fully independent maritime patrol aircraft overhead). The organic helicopter, as with the organic unmanned aerial vehicle, is not the 'unit' exercising ASL passage—that is the warship. The helicopter is but a sensor system attached to the warship and thus can be used to do what it is designed to do in the interests of safe, continuous, and expeditious navigation.²⁴

With this caveat thus explored, it is now possible to ask whether an unmanned surface vehicle or unmanned underwater vehicle can be a 'warship'? The physical elements present no problem: belonging to the armed forces of a state, and bearing its normal warship markings easily remedied. Is an unmanned surface vehicle or unmanned underwater vehicle 'under the command of an officer'? Certainly, 'under the command of' could be stretched to allow remote command, but when read together with the requirement for the warship to be 'manned' by a crew subject to regular armed forces discipline, this degree of elasticity can be doubted. In a purely practical sense, it is difficult to see how 'manned' could be stretched to include remote management and control, unless there is a (questionable) assertion that the unmanned surface vehicle or unmanned underwater vehicle is not the entirety of the entity in question, and its full physical manifestation includes the controls and controller sitting ashore. However, as noted above, this does not extend to the issue of an unmanned surface vehicle or unmanned underwater vehicle controlled by a mother warship. As the German Navy's Commander's Handbook asserts,

²³ *LOSC*, Article 53(3).

²⁴ It is important to recognise that some states would fundamentally disagree with this analysis. However, a number of major maritime powers have asserted that this is the interpretation to be placed on the ASL passage regime. See, for example, US Navy 2007, para 2.5.3.1 ('Surface warships may transit in a manner consistent with sound navigational practices and the security of the force, including the use of their electronic detection and navigational devices such as radar, sonar and depth-sounding devices, formation steaming, and the launching and recovery of aircraft'). The same applies to ASL passage: see, US Navy 2007, para 2.5.4.1.

However, the requirement of a vessel for being manned does not mean that unmanned vessels, e.g. drones...are not warships. Apart from the fact that they can be manned in certain situations it must be taken into account that they are controlled by a warship and thus enjoy its legal status and immunity.²⁵

It might be asserted, however, that the US Navy's equivalent Commander's Handbook appears to state the reverse:

USVs [Unmanned surface vehicles] and UUVs [unmanned underwater vehicles] engaged exclusively in government, noncommercial service are sovereign immune craft. USV/ UUV status is not dependant on the status of its launch platform.²⁶

But this assertion must be read in its context in that it is situated in a section of the Handbook which examines 'Other Naval Craft' as opposed to warships *per se*. This is further buttressed by the reference to status as 'engaged exclusively in government, non-commercial service'. It does not suggest that warship-launched and controlled unmanned surface vehicles and unmanned underwater vehicles have a completely independent status from that of their mother ship. Rather, the implication is that a government unmanned surface vehicle or unmanned underwater vehicle which is embarked on and controlled from a vessel which does not otherwise have sovereign immune status (such as a vessel undertaking a commercial operation, and thus not a state vessel), does not therefore suffer removal of its normal sovereign immune status, thus opening the door to any argument that this status has been replaced by a reflected image of the mother ship's own lesser, non-sovereign immune, status.

In summary, the author does not believe that an unmanned surface vehicle or unmanned underwater vehicle (either semi or fully autonomous) controlled from ashore (as opposed to from a warship) is itself capable of strict characterisation as a warship. But the reason why there is no need to stretch the definition to achieve this aim is that there is an alternative path to assuring the same sovereign immune status exists for a state's unmanned surface vehicle or unmanned underwater vehicle assets—these vessels are 'a government ship operated for non-commercial purposes'.²⁷ This concept is not expressly defined in the *LOSC*, thus there is no essential requirement (as for warships) that it be 'manned' or 'commanded'. There is clearly no issue with an unmanned surface vehicle or unmanned underwater vehicle enjoying the status of a government vessel on non-commercial service. As such vessels are entitled to the same sovereign immunity as warships,²⁸ there is no need to stretch the definition of warship to protect this characterisation.

²⁵ German Navy 2002, s. 2.I.1.

²⁶ US Navy 2007, para 2.3.6.

²⁷ See, for example, *LOSC*, Article 31.

²⁸ *LOSC*, Article 32 ('With such exceptions as are contained in subsection A [Innocent Passage rules applicable to all ships] and in Articles 30 and 31 [definition of warships, and coastal State right, in certain circumstances, to require warships to leave the territorial sea], nothing in this Convention affects the immunities of warships and other government ships operated for non-commercial purposes'; Article 96: 'Ships owned or operated by a State and used only on

Before turning to the examination of a discrete area of maritime operations law which, in the author's view, provides an example of the sufficiency of existing general principles to govern and regulate the use of unmanned surface vehicle and unmanned underwater vehicle, it is worth briefly noting two regulatory issues. The first is the issue of a proper and sufficient lookout (aimed at collision avoidance) as required under the International Regulations for the Prevention of Collisions at Sea (COLREGs).²⁹ In this respect, the combination of technology with existing legal regimes is sufficient to ensure adequate coverage of the field. This is for two reasons. First, it is anticipated that most unmanned surface vehicles will travel at higher speeds than many manned vessels, and this means that the 'lookout' impost is in a practical sense reduced. The physics of relative velocity solutions, which all mariners utilise in assessing potential collision situations, are such that vessels travelling at much higher speeds than other traffic can only be brought into collision situations within a narrow arc either side of ship's head. Thus the required lookout, whilst it must be maintained all round, can be much more focused on the physically possible collision arc ahead. This is, of course, not a complete answer, as more vessels attain higher speeds, the relative speed advantage will reduce and the possible arc of collision situations will correspondingly increase on either side of ship's head, but it does provide some practical succour for reduced anxiety as to the immediacy of this issue. This then leads us to the second point: unmanned surface vehicles that are remote from their controller, or are fully autonomous, will not be 'dumb'. They will have sensors, such as radar, just as manned vessels do, and will be controlled in accordance with the data that these sensors reveal. To the author's mind, there is little distinction between a manned vessel navigating through restricted visibility under the control of an Officer of the Watch standing on the bridge with his or her head buried in the radar, and a controller doing the same by reading the radar picture delivered instantaneously to their physically remote control station by the ship's sensor suite. To take the example further, if it is highly restricted visibility, the radar is unserviceable, and the Officer of the Watch is conducting collision avoidance through squinted eyes and peeled ears listening for the required restricted visibility sound signals of other vessels, there is no reason why a controller ashore who is receiving the same, if not actually enhanced, sensor information from the unmanned surface vehicles cannot conduct the navigation of the ship with the same degree of accuracy and safety.

Once we arrive at fully autonomous unmanned surface vehicles, which make entirely their own collision avoidance decisions on the basis of sensor input and data processing via highly contextualised algorithms, the situation will become more, but not irretrievably, complicated. Whilst there is clearly a potential for it all to go very badly wrong, there is also scope for removing certain forms of human

(Footnote 28 continued)

government non-commercial service shall, on the high seas, have complete immunity from the jurisdiction of any State other than the flag state').

²⁹ See especially, *Convention on the International Regulation for Preventing Collision at Sea*, 20 October 1972, 1050 UNTS 16 (entered into force 15 July 1977) ('COLREG').

error which plague shipping collision incidents. In many ways, collision avoidance is a much simpler thing to automate than decisions as to the correct characterisation and status of a potential target. And, as with targeting gone wrong, full automation does not necessarily imply that there is no longer a traceable line of responsibility, if not criminal liability.

There are two additional issues that may require clarification. First, there is no requirement to read into the definition of ‘vessel’ any necessity for transporting someone or something, which may be characterised as ‘separate’ from the vessel. The COLREGs’ definition of ‘vessel’ is designed to cast the broadest possible net of application, for the very sound reason that the larger the pool of craft upon the sea to which they apply, the easier it is to predict their ship handling and navigational conduct, and thus to prevent collision between them. Unmanned surface vehicles clearly transport whatever they contain (be it sensors, weapons or other systems) and proceed about the ocean with some purpose at the core of their passage. The COLREGs do not apply to a floating log or a fixed platform because neither has the capacity to make way (that is, propel through the water under some form of power) and thus to act in accordance with the COLREGs. An unmanned surface vehicle, which can make way (as opposed to merely being underway, meaning that it is not aground, at anchor, or made fast to the shore), is clearly subject to the COLREGs. The second issue concerns a vessel being described as ‘not under command’. The essence of ‘not under command’ status is the vessel’s inability to take collision avoidance action due to some special circumstances (such as loss of propulsion), not the presence of a human on board to ‘command’. The primary purpose of the ‘not under command’ identification requirement is to warn other vessels that they must take all necessary collision avoidance action as the ‘not under command’ vessel cannot take any action. The ‘command’ issue concerns the capacity of the vessel to respond to ship handling orders, not the presence of a human on board. The author believes that ‘command’—in terms of ‘not under command’ status, and the vessel’s capacity to respond to ship handling orders—could readily be exercised via remote link, so long as it is effective in terms of capacity to undertake normal collision avoidance.

14.4 Poise and Positioning of Maritime Forces

When considering the strategic utilisation of unmanned surface vehicles and unmanned underwater vehicles in the conduct of maritime operations, applying existing general principles may actually reduce the existing capacity for the conduct of state vessels to provide (as they currently do) such a rich source of dramatic, but legally defensible, consequences. This is because the very capacity for manned warships to act as highly visible ‘provocations’ carries with it a concomitantly high risk of lethal response to transgression. For example, it is clear

that under the *LOSC* submarines and other underwater vehicles, when exercising the right of innocent passage through a coastal state's territorial sea, must navigate on the surface and show their flag.³⁰ Let us suppose a manned submarine is detected dived in a territorial sea. Clearly, there will be a very strong and very reasonable suspicion that it is conducting some operation, such as intelligence collection, which is certainly against the interests of the coastal state (quite apart from the fact that it is a breach of innocent passage).³¹

Let us then suppose that the two states concerned differ as to their assessment of baselines and the submarine considers that it is legitimately dived because it is outside the coastal state's territorial sea. The coastal state, on the other hand, is of the view that the submarine is dived within their territorial sea—precisely the situation faced in the 1992 collision between *USS Baton Rouge* and a Russian submarine.³² As the International Court of Justice (ICJ) has indicated in *Oil Platforms*,³³ an attack on a warship can be readily characterised as an 'armed attack' for the purposes of invoking the right of national self-defence under Article 51 of the *UN Charter*.³⁴ That is, an attack on a warship is so serious an affront that it can be characterised as more than a mere use of force (which does not necessarily permit an immediate resort to use of force in response) such that it may constitute an armed attack on the flag state. One of the unstated reasons for this attribution of such a high level of gravity, and thus such a significant level of potential response, is that warships so clearly represent their sovereignty, and thus an affront by them and to them carries with it high offence. But another reason is that a warship carries many sailors on board—human agents of the sovereignty. If State A sank State B's submarine, with loss of all hands, the international political consequences would be most grave indeed.

Let us now suppose that the detected vessel is an unmanned underwater vehicle—for, let us face it, once it becomes cheaper, less risky, and more effective to use an unmanned underwater vehicle for such a task, most navies would seek to do so. It is clearly arguable that the offence created by its submerged presence in a territorial sea is equal in terms of the sovereign affront. There is no doubt that the

³⁰ *LOSC*, Article 20.

³¹ See, for example, O'Connell 1982, p. 297 ('On 26 October 1961, the Soviet Union issued a press release in which it "charged foreign submarines" with violating Soviet territorial waters, and announced that they would be destroyed. The Swedish and Norwegian Navies have launched depth-charges at submerged contacts in the Swedish and Norwegian territorial sea, and the Argentinian Navy has done likewise').

³² This collision between the dived *USS Baton Rouge* and a dived Russian Sierra class submarine occurred off Murmansk on 11 February 1992. See, for example, Miasnikov 1993; Cushman Jr 1992.

³³ *Oil Platforms (Islamic Republic of Iran v United States)(Merits)*, ICJ Reports 2003, 161, p. 195, para 72 ('The Court does not exclude the possibility that the mining of a single military vessel might be sufficient to bring into play the "inherent right of self-defence"'). For an analysis of the case, see, Bekker 2004.

³⁴ *Charter of the United Nations*, 26 June 1945, 1 UNTS XVI (entered into force 24 October 1945) ('*UN Charter*').

coastal state may thus seek to respond with an immediate use of force aimed at destroying the unmanned underwater vehicle. But the consequences related to sinking the unmanned underwater vehicle are vastly less deleterious than those associated with sinking a much more expensive, manned submarine, and the loss of life that would attend that act. If an unmanned underwater vehicle is lost, the raw asset cost, but more importantly the domestic outcry over loss of life, which would drive governmental action towards further escalation, will be markedly less. Leaving aside the significant and admirable restraint shown by the South Korean government in the wake of the *Cheonan* sinking on 26 March 2010 by a North Korean submarine-launched torpedo that resulted in the loss of 46 lives,³⁵ there can be no doubt that the sinking of an unmanned surface vehicle or unmanned underwater vehicle in the same circumstances would not have generated anything like the possibilities of escalated conflict, belligerent military action, and further loss of life that were close to eventuating in that situation. Thus, whilst increasing use of unmanned surface vehicles or unmanned underwater vehicles to conduct maritime surveillance could, of course, actually increase the frequency of incidents permitting use of force against these vessels, the significantly lesser consequences that result—in that no crew will be killed—also radically reduces the inherent risks of escalation involved with an armed response against the platform. The use of unmanned underwater vehicles or unmanned surface vehicles in such politically and strategically sensitive and contested maritime operations will serve to transfer risk away from human crew, and thus lessen the ‘stakes’ inherent (for both sides) in the application of legitimate countermeasures that involve the use of force. Applying the existing general principles of law—in this case the relevant provisions of the law of the sea, and the law relating to the use of force in accordance with the *UN Charter*—could actually return a significantly less dangerous, and thus politically and legally explosive, result.

14.5 Conclusion

There is little doubt that the emergence of unmanned vehicles issues is challenging, and will continue to challenge, the law applicable to maritime operations. But the author is of the firm view that an incremental approach is the only viable means of addressing these challenges. It is certainly not defensible to say that we already have all the law we need. However, this is because we cannot know for certain what innovations in capability or public opinion will emerge, not because the current law of armed conflict and law of the sea regimes are incapable of adequately and sensibly responding. We are not confronted with a significant legal

³⁵ See, Joint Civilian-Military Investigation Group 2010; Cha 2010.

vacuum. Nor are we confronted with the imminent consequence that failure to immediately develop new law will result in unregulated, uncontrolled conduct. As this chapter has attempted to indicate, there is great strength, stability, and sense in evolving existing regimes of governance, as opposed to rushing to create new law. The application of existing general principles, rather than the development of untested regimes of detailed regulation, should thus be encouraged to the fullest extent possible—at least until we have learned, from practical experiences, a little more about the realities that attend the use of unmanned vehicles in maritime operations.

References

- Bekker PHK (2004) Oil platforms (Iran v United States). *Am J Int Law* 98:550–558
- Cha V (2010) The aftermath of the Cheonan. Centre for Strategic and International Studies. <http://csis.org/publication/aftermath-cheonan>. Accessed 25 April 2013
- Clausewitz C (1832) *On war* (trans: Howard M, Paret P (1976)). Princeton University Press, Princeton
- Cushman JH Jr (1992) Two subs collide off Russian port. *New York Times* (online). www.nytimes.com/1992/02/19/world/two-subs-collide-off-russian-port.html. Accessed 24 April 2013
- German Navy (2002) Commander's handbook: legal bases for the operations of naval forces (on file with author)
- Heyns C (2013) Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions on lethal autonomous robotics. UN Doc A/HRC/23/47
- Joint Civilian-Military Investigation Group (2010) Investigation result on the sinking of ROKS 'Cheonan'. www.globalsecurity.org/military/library/report/2010/100520_jcmig-roks-cheonan/100520_jcmig-roks-cheonan.htm. Accessed 25 April 2013
- Livezey WE (1981) *Mahan on sea power*. University of Oklahoma Press, Oklahoma
- Mahan AT (1890) *The influence of sea power upon history 1660–1783*. Dover Publications, New York (Reprinted in 1987)
- Mahan AT (1899) Peace conference at The Hague 1899: report of Captain Mahan to the United States Commission to the International Conference to The Hague, on disarmament, etc, with reference to Navies. Yale Law Library Avalon Project. http://avalon.law.yale.edu/19th_century/hag99-06.asp. Accessed 24 April 2013
- Miasnikov E (1993) Submarine collision off Murmansk: a look from afar. www.armscontrol.ru/subs/collisions/db080693.htm. Accessed 24 April 2013
- Military Analyst Systems (1998a) MK 60 encapsulated Torpedo (CAPTOR). www.fas.org/man/dod-101/sys/dumb/mk60.htm. Accessed 24 April 2013
- Military Analyst Systems (1998b) MK 67 submarine launched mobile mine. www.fas.org/man/dod-101/sys/ship/weaps/mk-67.htm. Accessed 25 April 2013
- O'Connell DP (1975) *The influence of law on sea power*. Manchester University Press, Manchester
- O'Connell DP (1982) *The international law of the sea*. (ed: IA Shearer) vol I. Clarendon Press, Oxford
- Roberts A, Guelff R (eds) (2000) *Documents on the laws of war*, 3rd edn. Oxford University Press, Oxford
- Solis GD (2010) *The law of armed conflict: international humanitarian law in war*. Cambridge University Press, Cambridge

- UK Ministry of Defence (2004) *The manual of the law of armed conflict*. Oxford University Press, Oxford
- US Navy (2007) Commander's handbook on the law of naval operations. [http://www.usnwc.edu/getattachment/a9b8e92d-2c8d-4779-9925-0defea93325c/1-14M_\(Jul_2007\)_\(NWP\)](http://www.usnwc.edu/getattachment/a9b8e92d-2c8d-4779-9925-0defea93325c/1-14M_(Jul_2007)_(NWP)). Accessed 24 April 2013
- Venturini G (1988) 1907 Hague Convention VII Relating to the Conversion of Merchant Ships into Warships. In: Ronzitti N (ed) *The law of naval warfare: a collection of agreements and documents with commentaries*. Martinus Nijhoff, Leiden, pp 111–112