1. Introduction: international security, armaments and disarmament

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I. Overview

This 47th edition of the SIPRI Yearbook reviews the main trends and events in conflict and security during 2015, and places them in a longer and larger perspective. Taken individually, many of the events were terrible, especially the shattering incidents of terrorism in Iraq and Syria, in Ankara, Istanbul and Paris, in Tunisia, in Afghanistan, Nigeria and Pakistan. The background to this was state and non-state violence in an increased number of armed conflicts, with notable degrees of escalation in some of them during the year. Meanwhile news headlines and political attention in Western Europe were occupied for months on end by the flow of a million refugees and migrants from conflict-affected countries. From a wider perspective, the totals of 60 million refugees and displaced people and a further 10 million stateless people were the highest such figures since the foundation of the United Nations High Commissioner for Refugees (UNHCR) in 1950. At the same time, tensions between North Atlantic Treaty Organization (NATO) member states and Russia increased in the face of continuing disputes over Ukraine and policy differences over Syria. From all this and more, it was not difficult to characterize 2015 as one of the darkest years for international stability and human security since the end of the cold war in 1991.

Other developments in 2015, however, might, if taken in isolation from the events noted above, suggest a radically different reading of the year. Iran and the United States resolved their differences about Iran’s nuclear programme in July 2015. The Joint Comprehensive Plan of Action (JCPOA) now regulates Iran’s nuclear material stockpiles and technology programme. It also removes a major irritant from the prospects for security and stability in the Middle East, even if the deal’s merits were not equally appreciated by all major actors.

A second positive development came two months later, as the international community gathered in New York at the United Nations summit to agree the

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2 For example, this was the implied judgement of several of the articles in *The Security Times—Special Edition for the 52nd Munich Security Conference* (MSC: Munich, Feb. 2016).
Sustainable Development Goals (SDGs), also known as Agenda 2030. This agreement sets out the ambitions and asserts a pathway for international development by 2030 to eliminate extreme poverty, end hunger and, inter alia, promote just, peaceful and inclusive societies.

A further indication of the health of the international system came in December: re-gathered in Paris, the international community agreed a series of ambitious measures to address the pace and pressure of climate change. The Paris Agreement aims to keep the average increase in global temperatures ‘well below’ 2°C compared to pre-industrial levels. Its second aim is to increase the ability of affected countries and governments to adapt to the inevitable effects of changes in climate—which are still, as yet, imperfectly known or understood—because of past and current greenhouse gas emissions. While the Paris Agreement is not ostensibly a peace measure, there is growing evidence that the impacts of climate change are already having negative effects on peace, stability and human security. This allows for the judgement that reducing the ultimate level of climate change and increasing the ability to adapt to its consequences will indeed have the effect of enhancing stability and human security.

How best, then, to characterize the direction in which security and stability moved in 2015? There are foundations for both pessimism and some optimism, although even an optimist might concede that in 2015 it was all too easy to identify a plethora of worrying events.

II. Unfolding problems of insecurity and conflict, 2015

Overall statistics for armed conflict in 2015 show a significant increase in the number of active conflicts compared to 2014 (see chapter 6, sections II and IV). These figures need to be treated with some caution, especially as to whether they reflect a firm trend. There was for instance a spike in the number of active armed conflicts in 2011 compared to 2010 and 2012 levels.

Following the end of the cold war, there was a short-lived surge in the number of armed conflicts each year until 1994. At that point, the peace dividend of the end of the cold war started to be experienced. Annual numbers of armed conflicts declined steadily for over a decade thereafter, bottoming out in 2007. Furthermore, although war is always terrible, the data showed armed conflicts in that period were on average both shorter and, making allowance for uncertainties around data about the casualties of war (see chapter 6, section V), less lethal than in previous decades. Since 2010, the data has been moving in the wrong direction. While this has not been wholly consistent from year to year, in 2015 the number of armed conflicts active

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in the year is recorded as exactly the same as it was in 1990 as the cold war came to end: 50.

The question therefore arises as to whether the growth of peace for two decades after the end of the cold war—the great under-reported good news story of our time—has come to an end. Is there a reversal of peace? The analysis of this question in this Yearbook arrives at a less sweeping conclusion (see chapter 6, section III). Nonetheless, there has been an increase in armed conflict. In exploring this increase—and while the Horn of Africa saw serious conflict during 2015—an effort to marshal the argument that international peace is in retreat would almost certainly look closely at both Europe and the broad region of the Middle East and North Africa, which remained troubled and troublesome areas in 2015.

Ukraine

In Europe, conflict in Ukraine burned on albeit at a lower temperature than in 2014. While the consequences for many people in the Donbass region were nonetheless tragic and their situation remained extremely insecure, the locus of international concern about Ukraine began to shift from the immediate effects of warfare to the intractability of the underlying conflict. How was a durable resolution of the conflict to be reached when the positions of Russia and its local allies, on the one hand, and the Kiev Government and its international allies, on the other, appeared profoundly incompatible? An international institution designed explicitly for handling, managing and eventually resolving such a conflict—the Organization for Security and Co-operation in Europe (OSCE)—was deeply engaged in the crisis. Talks overseen by the OSCE led to an agreement signed in Minsk in February. This package of measures agreed between Ukraine, Russia, France and Germany, and known as the Minsk II agreement, replaced the previous Minsk agreement dating from September 2014. Minsk II is a ceasefire agreement with provisions for withdrawing heavy weapons, starting dialogue and facilitating humanitarian relief in the war-torn areas. The political core of the agreement lies in the balance it strikes between insisting on respect for the recognized borders of Ukraine and promising constitutional reform within the country to decentralize government authority.

The agreement was criticized in some quarters for its complexity, fragility and vagueness on key issues; further grounds for concern lay in the issue of implementation. Five months on, a European Parliament briefing reported that the death toll in fighting since the ceasefire had already risen

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to 1000. The OSCE monitoring mission has reported that its access and operations are restrained ‘by restrictions imposed by third parties’ as well as by security considerations such as the unmapped and unmarked presence of landmines. By the end of 2015, there was no sense in which the conflict had been resolved and grounds for concern, therefore, that fighting could flare up again and duplicate or increase the human costs experienced in 2014. The appropriate international institution, the OSCE, had been engaged by the leading regional powers and parties involved in the conflict in an effort to resolve matters, but to little evident avail.

The Middle East and North Africa

In the broad region of the Middle East and North Africa, violent sequels to the 2011 uprisings and anti-government mobilizations continued to play out in several Arab countries. In retrospect, the events of 2011 already look less like an Arab Spring and more like the start of a decade of instability and intensified conflict. The rise of the group known as the Islamic State (IS) in Syria and Iraq continued apace in the first half of the year (see chapter 2, section II). The group continued to celebrate and provide gruesome evidence of its major atrocities and acts of violence, but it remained the case that most of the casualties in the fighting in Syria were inflicted by government forces—reportedly, 75 per cent of the total in 2015. With the government of President Bashar al-Assad under severe pressure, in September Russia committed forces to direct combat in support of it. The declared aim of only attacking IS and similar groups was contested amid immediate and repeated claims that Russian airpower was being directed against any opposition to the Assad Government. This was a move of immense strategic significance in the region and possibly globally. It may yet result in a military disaster for Russia, but the immediate consequence was that it ensured that the Assad Government would be a major player in any eventual settlement in Syria, were there to be one between some of the contending forces. By the end of 2015, however,
the degree of success the Russian action might ultimately enjoy remained unclear.10

The war in Yemen escalated as a coalition led by Saudi Arabia weighed into a complex conflict, primarily with air power but also with Saudi ground forces crossing the border into Yemen from late August onwards.11 While the Saudi intervention targeted the Houthi insurgents, forces loyal to the elected President, Abd Rabbuh Mansur Hadi, and former President Ali Abdullah Saleh also contested power. The militant Salafist group al-Qaeda in the Arabian Peninsula was the dominant power in large swathes of the less populated eastern parts of the country.12

Similarly, in Libya a chaotic situation persisted, with rival claimants for governing legitimacy, hundreds of local militias operating in support of one or other (or neither) government, and the increasing presence of IS along the Mediterranean coast. Despite apparent agreement on power-sharing at the end of 2015, which held the promise of giving Libya a single government accepted as legitimate by the major contenders for power, the political situation remained indeterminate.13 Until this is resolved, it is hard to see how there could be any significant success in efforts to bring much-needed stability and security to the country. An assertion of legitimate governance seemed by the end of 2015 to be a necessary condition for managing multiple and now protracted conflicts at the regional and local levels within the country, let alone moving them in the direction of resolution and a sustainable peace.

In Egypt, international concern focused on the human rights situation under the Government of President Abdel Fattah al-Sisi, formerly head of the army, who was elected in 2014.14 Equally concerning from an international perspective, however, was the return of armed insurrection. The insurgency in the Sinai could in part be seen as a recurrence of earlier combat. Violent conflict in Egypt during the 1990s had culminated in the Luxor massacre of tourists in 1997.15 A determined campaign by Egyptian security forces brought that wave of violence to an end, although there was a brief and lethal return of violence in the mid-2000s, largely through bomb attacks on the tourist resorts in the Sharm el-Sheikh region. Resort to arms began again after the ousting of Hosni Mubarak from the presidency. Branding itself first

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as an al-Qaeda affiliate, the jihadi group Ansar Beit al-Maqdis (Champions of the Holy House) attacked sporadically, repetitively and then continually in the North Sinai, before rebranding itself as the Sinai Province of the Islamic State.\footnote{Hauch, L., ‘Egypt Analysis: How the Islamic State moved into the Sinai’, EA Worldview, 6 Feb. 2016.}

**The proliferation of violence**


These events all combined to generate an uneasy and insecure sense that the violence of the region had no boundaries—and they were presumably designed for precisely that effect. More broadly, they emphasized the inability of the states of the Middle East and North Africa, and those of Europe, as well as both Russia and the USA, to control or manage the conflict dynamics of the region. It is perhaps less clear whether this is also one of the motives for planning and ordering such attacks but it seems to be part of the effect.

The impulse to retaliate was especially powerful in France after the November attacks. While this is an easily understood reaction, some saw it as a strategic mistake, since inciting retaliation is a goal of actions such as the Paris attacks.\footnote{Todenhöfer, J., ‘I know ISIS fighters: Western bombs falling on Raqqa will fill them with joy’, The Guardian, 27 Nov. 2015.} By this account, retaliation achieves much for IS. It increases their prestige and thus their external support and recruitment potential. It also cements the narrative that what is happening in Syria and Iraq is a Western war against Muslims, whom IS is defending, whereas the reality is that the vast majority of the group’s victims are actually Muslims. Moreover, it would help the IS fighters live out their apocalyptic vision of
a final showdown between good and evil, represented by the forces of the decadent West.20

On the other hand, it is not clear that all the IS leaders and fighters see the world and their struggle in these apocalyptic, zealous terms. Many in the senior leadership have a secular political background in the Iraqi Ba’athist establishment under Saddam Hussein.21 Research among young Syrians has unearthed the pragmatic, financial motives that many share for joining IS or other Salafist forces and militias; while religion is not absent, it is not often the decisive factor.22

If the analysis of an idealistic, apocalyptic basis for IS is correct, then retaliation for their outrages is unlikely to offer much prospect of ending the conflicts and the consequent insecurity. As a strategy, it presupposes a rational calculus among IS that is far removed from apocalypticism. However, if the alternative analysis is right to stress pragmatic concerns within IS, then it could perhaps be argued in the abstract that retaliation, as long as it is shrewdly targeted, could influence the IS fighters’ calculations of loss and gain. The problem with this line of argument, however, is that it is simply abstract. In practice, it shows no sign of working. It is probable that a full understanding of IS requires a yet more subtle and variegated grasp of the diverse and divergent motivations for and reasons why the IS leadership has been able to successfully offer a cohesive rallying point. According to the same line of reasoning, it is unlikely that responses to the challenge to stability, security and general well-being offered by IS and similar groups will be successful if they operate at only one level and with only one instrument.

More than a decade of military responses to terrorist attacks offers no evidence that this strategy will achieve an end to terrorism, or even the defeat of the group that perpetrated the latest outrage, let alone find a sustainable solution to the problems that underlie terrorism. One concern must be that if a force such as IS were defeated on the battlefield, it might simply go underground. The evolution of IS reveals extraordinary resilience in the face of near disaster.23 After over 14 years of what US President George W. Bush designated the global war on terror, the international reach and impact of two major terrorist networks—al-Qaeda and its offshoot, IS—have grown.24 They have carried out more frequent operations in more countries with more impact, and are recruiting from a more widespread and diverse pool than

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24 US Department of State, The Global war on Terrorism: The First 100 Days, Archive [n.d.].
al-Qaeda had managed in the decade or so before the attacks on the World Trade Centre and the Pentagon in September 2001.

Focusing on this region, these conflicts and this spiral of action and counter-action might lead to an uncomfortable conclusion. It might suggest that peace is not well protected by the array of international institutions, national governments, their forces and instruments that are devoted to enhancing security and international stability. Peace may not be in retreat as yet, but it is hard not to see it as being under serious pressure.

III. Responding to insecurity

What are, or could be, the countervailing forces? To explain the decline in the number of armed conflicts from the mid-1990s, the Human Security Report in 2005 made the case that the only empirically viable explanation was ‘the extraordinary upsurge of activism by the international community that has been directed toward conflict prevention, peacemaking and peace-building’.\(^\text{25}\) Despite the shortcomings of UN peace operations during the closing decade of the 20th century, when lessons needed to be ‘bitterly and repeatedly’ learned, all other explanations for the growth of peace turned out to be inadequate.\(^\text{26}\)

If there is now evidence that peace is under pressure, then one place to look for an explanation is in the self-same international community’s capacity and willingness to continue in activist mode. This cannot be the whole explanation, of course. The underlying causes of conflicts and foundations of sustainable peace are not all amenable to short-term action by international institutions. Other things being equal, however, it is reasonable to suspect that a general increase in violent conflicts and political instability says something about international institutions losing some of their former traction and effectiveness.

The record in 2015, however, as the opening section of this chapter indicates, is far from bleak. One major bone of regional contention in the Middle East—uncertainty about the intentions behind and the direction of the Iranian nuclear technology programme—has been settled with the signing of the JCPOA by Iran and the so-called E3/EU+3—France, Germany and the United Kingdom (the E3), China, the Russian Federation and the United States (+3), facilitated by the European Union (EU)—in July.\(^\text{27}\) While the


\(^{27}\) International Atomic Energy Agency, Communication dated 24 July 2015 received from China, France, Germany, the Russian Federation, the United Kingdom, the United States of America (the E3/EU+3) and the Islamic Republic of Iran concerning the text of the Joint Comprehensive Plan of Action (JCPOA), INFCIRC/887, 31 July 2015. For the full text of the JCPOA see <http://eeas.europa.eu/statements-e eas/docs/iran_agreement/iran_joint-comprehensive-plan-of-action_en.pdf>.
achievement of this long-sought agreement ushered in a new round of dispute and contention as Saudi Arabia and Israel joined in condemning it, a dispassionate analysis of the available evidence and the terms of the agreement indicate that it is soundly drafted and there are strong prospects for fully successful implementation (see chapter 17, section I). In short, it is a good deal.

A full account of the process of achieving the Iran deal has yet to be written but a cursory glance at the record suggests it may well reflect the very best of diplomacy and of international institutions. This dispute had been continuing since 2002, when evidence of undeclared nuclear activities in Iran surfaced, and heated up in 2005. During the Iranian Presidency of Mahmoud Ahmadinejad (2005–13), a negotiated settlement seemed unlikely. Successive resolutions by the Board of the International Atomic Energy Agency (IAEA) assessed Iran’s compliance with the terms of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), to which the Islamic Republic is a party and by which it is therefore bound. Successive UN Security Council resolutions also underlined the mandatory nature of what the IAEA required of Iran. Nonetheless, quiet diplomatic work also continued. The election of President Hassan Rouhani in 2013 opened the way to political progress, which was able to build on the technical and diplomatic work already done.

The roads to both the UN Sustainable Development Summit in September 2015 that signed up to Agenda 2030 and the Paris Climate Summit in December (the 21st Conference of the Parties to the UN Framework Convention on Climate Change, COP 21) were similarly paved with hard work. There were multiple grounds for scepticism about both enterprises, despite the political weight that was put into the preparation of Agenda 2030, and the scale of the effort that lay behind COP 21. In the latter case, the effort lay both in establishing the scientific basis for concern and action over a period of almost three decades, and in the enormous international institutional effort by the secretariat of the UN Framework Convention on Climate Change (UNFCCC).

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30 At the apex of the scientific work is the assessment work carried out by the Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/report/ar5/wg2/> , which is negotiated in detail to maximize its scientific merit and political impact. On the work of the UNFCCC secretariat see its website, <http://unfccc.int/essential_background/items/6031.php>.
opinion, perhaps most dramatically demonstrated by the issuance of the Papal Encyclical *Laudato Si’* in May 2015.31

Both global efforts led to success: consensus support for the SDGs and for urgent action to restrain the extent of climate change and support adaptation to its unavoidable effects.32 To that extent, at least, international experience in 2015 offered an antidote to the bleak assessments that many international events that year could clearly generate.

It is unfortunately necessary to enter a major, if obvious, caveat: the sensitive question of implementation, just as with the Minsk II agreement discussed above. Even if scepticism turns out to be unjustified about the process of achieving agreement, it is wise to be cautious about believing that what was been endorsed will therefore be enacted. In this regard, there are major differences between the Iran deal and the other two agreements discussed here. While the Iran deal had to find a subtle balance of rights and responsibilities in a field that had almost as much technical uncertainty as political disputatiousness, the two global agreements are of a wholly different order of complexity. These are wide-ranging agreements that touch directly or indirectly on many fundamental aspects of how societies, national economies and power are organized. Their implementation will require some areas of radical change involving the combined efforts of most governments, many international institutions and other actors, including non-governmental organizations, over a decade and a half.

In the case of the Iran deal, scepticism about the prospects of full implementation is largely based on doubts about the technical competence underpinning the agreement or the good intentions of either Iran or the other signatories. This is a more concentrated scepticism about a tightly focused agreement than with the two global agreements. It is a case of detailed questions about the honesty and competence of a few specific actors. With the two global agreements, what is at stake is the question of whether the international system as a whole is capable of this kind of far-reaching, large-scale change as a consciously willed process.

Uncertainty about the prospects of large-scale projects, such as slowing down climate change and advancing sustainable development in Agenda 2030, is hardly surprising given other factors on the world scene. The World Economic Forum placed increasing socio-economic inequality at the head of its list of worrying world trends and documented both the evidence of persistently deepening inequalities and the widespread perception that it is a major problem.33 The same review also noted the importance of climate-re-

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lated pressures such as the increased incidence of severe weather events and increasing water insecurity, itself a critical component of food insecurity.\textsuperscript{34}

On the economic front the world ended 2015 amid increasing worries about mid-term stability in the world economy.\textsuperscript{35} Concerns focused not so much on the severe slump in share prices in China at the beginning of 2016, which had repercussions for global share values, as on Brazil, which was experiencing a prolonged recession, burdened by a series of corruption scandals and facing, in the view of \textit{The Economist}, the prospect of ‘a lost decade’.\textsuperscript{36} In a world in which connectivity and interdependence are such a deep part of economic and social realities that the terms have become clichéd, the continued dimming of what was until recently seen as one of the stars among emerging economies is a blow to hopes that economic growth will pick up. This in turn creates a less propitious and less confident context for action to resolve and manage conflicts. In many countries, both economic resources and political energies are likely to be devoted elsewhere. There can all too easily be a sense that the available international institutions and instruments and the national political leaders who must galvanize and chart the way for those institutions are at risk of being overwhelmed by the sheer number of the challenges they face.

Political events in 2015 showed that the international community is capable of addressing complex problems and designing solutions. There were reasons enough, however, to be uncertain about how durable those solutions would turn out to be, and more than enough reasons to recognize that it will always be hard work to generate the cohesion and determination along with the creativity to keep managing the problems that will emerge.

\section*{On the military side}

Against this mixed background, the \textit{SIPRI Yearbook 2016} records a situation in world armaments that gives few grounds for comfort. Military spending and the arms trade are both steadily increasing (see chapters 13 and 15). Taken overall the rises are modest: military spending in 2015 was about 1 per cent higher than in 2014, and in Europe and North America military spending actually fell. The value of the international arms trade, which SIPRI calculates on a five-year basis rather than annually in order to deal with the weaknesses in the available data, increased by 14 per cent in 2011–15 compared to the previous five-year period of 2006–10. In constant values, the

\begin{footnotesize}
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\item \textsuperscript{34} World Economic Forum (note 33).
\item \textsuperscript{35} Elliott, L., ‘2016 will be a year of living dangerously for the global economy’, \textit{The Guardian}, 27 Dec. 2015.
\end{itemize}
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International arms trade is worth less now than at its peak in the early 1980s, but the data reveals a steady increase over the past decade. Unsurprisingly, the largest growth in arms imports in the recent period was in the Middle East, where there was an increase of 61 per cent between the two five-year periods.

Of greater concern at this stage, however, are the trends in nuclear weapons (see chapter 16). The USA, Russia, China, France and the UK are all entering into or proceeding with modernization and upgrade programmes for their nuclear weapons. Although implementation of the 2011 Strategic Arms Reduction Treaty seems to be in good shape, Russia and the USA complained in 2015 about each other’s implementation of an older treaty, the 1987 Intermediate Nuclear Forces agreement, which was the cornerstone of reductions in nuclear forces in Europe.37 Worse still, there are no current negotiations about future strategic arms limitations and reductions, and there are no treaty commitments that any of the Nuclear Weapon States recognized under the NPT regard as constraints on plans to replace and upgrade their own nuclear weapon systems. This is highly debatable since all five governments are parties to the NPT, in which article VI commits them ‘to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament’.38 The five-year review conference of the NPT in 2015 ended without agreement on a final document, let alone on recommendations on how to promote nuclear reductions and avoid any further proliferation (see chapter 15, section II).39

In this light, it becomes difficult for the established nuclear powers to generate much by way of moral condemnation of the continued determination of other states—Israel, India, Pakistan and the Democratic People’s Republic of Korea (DPRK, North Korea)—to maintain and advance their nuclear status. In the case of North Korea, while there was no nuclear test in 2015, there was a submarine-launched ballistic missile test in May as well as other short-range missile tests, and the year ended with expectations of an imminent nuclear test—expectations that turned out to be well-founded in the first days of 2016. This was the fourth nuclear test explosion by North Korea and, it claimed, the first using a thermonuclear device—a claim greeted with some scepticism in the West.40

38 Non-Proliferation Treaty (note 28).
On the basis of 2015, and despite the great step forward made with the Iran deal, it seems unlikely that the nuclear disarmament agenda will be revived in the short-term.

IV. Conclusions

SIPRI was founded in 1966, making 2016 our 50th anniversary year. In May 2015, the Governing Board of SIPRI proposed that the institute treat the golden jubilee year as a ‘year for reflection’. It did so not on the basis that action is not urgent, for that would be quite misleading, but rather on the basis that some of the peace and security issues with which the world is now grappling quite clearly require close attention and deep thought in order to figure out what to do about them. That the events and trends of 2015 offer a complex and uncertain picture is not in itself surprising. There is so much packed into most years that paradox and uncertainty are hallmarks of security issues—and, indeed, many other issues besides. Nonetheless, it does seem right to think, in 2015 and 2016, that there is something more challenging about seeking to understand the present period.

If the end of the cold war in the period from 1989, when the Berlin Wall came down, to December 1991, when the Soviet Union was dissolved, marked the end of one era of global politics, it now seems that around the time of the financial crash and economic crisis of 2008–2009, the post-cold war era similarly ended. Patterns of world power are shifting and the established great powers have had to pay attention to new actors on the global scene. This has been marked most dramatically by the growing self-confidence of Russian policymakers and their increasing willingness to stake Russia’s claims and take action in Russia’s interests as they see them—as in Ukraine and Syria—even at the expense of confrontation with Europe and the USA. It is also visible in the steadily greater role that is being accorded to China on a growing range of issues and in a growing number of regions. In the Middle East, Iran and Israel have been autonomous actors for many years; now too Saudi Arabia has emerged to forge distinct policy positions and strategies of its own, even at the cost of a rift with its US ally over politically salient issues.

This shift in world power has, moreover, emerged at a time when the trend line in the frequency of armed conflict has changed for the worse. One is not the cause of the other but their co-occurrence is a source of concern.

There is, then, plenty of material for reflection, and plenty of reasons for pausing to reflect. SIPRI’s role is both to encourage that process of thought and assessment and, through the data and analysis that are our stock in trade, to provide at least some of the wherewithal for thinking the problems through and finding the best ways forward.