

From the guest editors

This edition of *Scientia Militaria* presents the diversity of military geoscientific research currently under investigation by military geoscientists. Although geoscience has always been an integral component of military studies, the International Association for Military Geosciences (IAMG) was founded as recently as 2013. This was during the 10th International Conference on Military Geosciences (ICMG), held in Aviemore, Scotland. The IAMG developed from the conference series that originated from a symposium in Seattle, Washington (USA) in 1994. From its humble beginnings as a one-day conference, it has developed into a biennial event over five days, usually followed by a post-conference fieldtrip. The 12th ICMG was convened under the auspices of the IAMG from 18–23 June 2017, in Stellenbosch, South Africa. The editors have selected contributions from the 2017 ICMG exploring the scope, reach and impact of military geosciences.

In order to provide some context and to chronicle the development of military geosciences, Ted Rose – a founder member of both the ICMG series and the IAMG, and first President of the IAMG – traces the history of the ICMG and its development over the past 23 years. Rose contends that the twelve ICMGs and the founding of the IAMG over the last 20 years have raised the profile of military geosciences as an academic discipline significantly by acting as a catalyst for other conferences and books and for an influential number of articles published in respected peer-reviewed journals.

Hermann Häusler analyses the special military geoscientific unit of the German counter-intelligence service in North Africa during the Second World War. This unit, the Sonderkommando Dora, consisted of ten military geoscientists, among them geographers, cartographers, geologists, astronomers, meteorologists and road specialists. They aided the German war effort by reconnoitring the routes in the area of operation, providing cartographic maps of important routes crossing the Sahara, and supplying geologic information on water supply, trafficability, natural obstacles and magnetic deviation. In 1941, at a time when the Italian topographic maps were not accurate enough for assessing routes from Chad to Libya, Sonderkommando Dora substantially enhanced topographic maps at various scales and prepared special military geoscientific maps of this border area to assist the German Armed Forces High Command in decision-making.

Ted Rose examines the only unit within British and Commonwealth forces of the Second World War in which geologists and geophysicists deployed as a team into campaign areas, the 42nd Geological Section of the South African Engineer Corps. The article provides a history of this specialist unit from formation to operational deployments. The 42nd Geological Section contributed to the Allied war effort by using geophysical methods to locate water supply in the sometimes harsh and bone-dry operational areas of East Africa, North Africa, the Middle East and the Mediterranean region.

Peter Guth's article reports on modern methods of mapping castles and fortresses, particularly the use of the LiDAR point cloud as a critical data source for terrain analysis. In doing so, he enhances our understanding of military history and the associated terrain features, using cutting-edge, perhaps even revolutionary, technology. The value of LiDAR, Guth explains, is found both in its application for historical study, for new areas of research, and for contemporary terrain analysis, for mission planning, execution, and post-operation analysis.

Andy Lohman reminds us that military forces have been able to overcome the inherent challenges posed by physical geography, mainly through the application of advanced technologies. There are however two areas where the military geography literature has not paid much attention. The first is airborne operations, the second cultural landscapes. Here Lohman's case study on the American operation of 1945 to seize Corregidor Island in the Philippines, considered the airborne assault as well as the cultural landscape and terrain intelligence using both primary and secondary sources. As his research demonstrated, the battle to recapture Corregidor Island is an excellent case study, both from a historical perspective as well as for its similarities to the current operating environment. His analysis demonstrates that while the physical terrain of Corregidor was challenging and weather was a vital consideration, the cultural landscape proved far more significant in the planning and the subsequent course of the battle.

In their contribution, Hennie Smit and Hannes van der Merwe discuss the military environmental literacy of the soldiers of the South African Army. They point out that traditional military activities are inherently destructive of the natural environment if not managed correctly. Thus, they argue that it is important for soldiers to display the correct attitude toward, behaviour in, and knowledge about the diverse physical, social and cultural environments they occupy and on which they have an effect. In seeking to understand the level of environmental literacy in the South African military context, research was conducted through an original questionnaire and content analysis.

Marko Bulmer's article takes us to Southern Nineveh, Iraq and the surrounding oil fields between June 2014 (when the Islamic State [IS] took control of the area) and August 2016 (when the Iraqi forces recaptured the area). His analysis is of the complex battlespace created when the oil wells were intentionally set alight during the latter stages of the occupation. Through the data, a picture is presented of environmental degradation as a weapon of war, both to deter air strikes and to thwart a ground advance. Furthermore, Bulmer argues that the oil wells set alight in Quyyara, combined with the fires created at the Al-Mishraq sulphur plant, created a toxic atmosphere of environmental chemical weapons. The resulting environmental degradation in affected areas amplified the humanitarian crisis, affecting civilians, military personnel and humanitarian workers. This highlights the need for accurate and timely health and environmental threat assessment in conflict areas.

Pierre Taborelli and his co-authors investigated the geographical conditions of the Western Front during the First World War. The article presents a methodology to understand the spatial organisation of defence networks by means of Geographical Information System (GIS) technology intersected with a Digital Terrain Model (DTM). The spatial analysis of the trench lines along a tract of the Western Front in France moves our understanding from representations of the trenches as mere lines on a map to a more comprehensive understanding of the role of relief, geology and hydrography in structuring the front of the Great War.

Staying on the Great War, Vittoria Laterza and her co-authors report on the ammunition used in the Alpine Austrian–Italian front located in the Italian Alps. In their research, using elemental fingerprinting methods, they identified the elemental and lead isotope composition of shrapnel balls and bullets from the First World War. The multi-elementary analysis and lead isotopic composition of these historical military artefacts showed the different raw materials used for the production of these types of munitions used by the Italian and Austrian–Hungarian armies. By investigating lead isotope ratios, the possibility to differentiate most of the Italian shrapnel balls from those of Austrian–Hungarian origin is shown. This also demonstrates the potential applications of trace elements and lead isotope analyses to differentiate between military artefacts of different origins. As the authors conclude, this may benefit future reconstruction of military fighting by aligning the correspondence between literature and field data on the real deployment of soldiers

Taken together, these articles represent a small selection of the wide array of military geoscientific issues studied by military geoscientists. As a journal, which considers Military Science a multidisciplinary science, *Scientia Militaria* displays in this volume the variety and diversity of military issues being researched. Ultimately, it also reveals the effect such studies could have on a better understanding of military actions, both for retrospection and future planning.

Hennie Smit and Jacques Bezuidenhout

Obituary: Dr Jean Martin (1956–2018)

Jean Martin, a pioneering member of the International Association for Military Geosciences (IAMG), died unexpectedly following a heart attack on 3 April 2018.

Jean started to attend the biennial series of meetings now called the International Conferences on Military Geosciences (ICMGs) soon after these were extended to include geographers as well as geologists – and he, as a geographer, therefore became eligible to participate. In 2007, the 7th ICMG meeting was convened in Canada under his leadership, at the Université Laval, in Quebec City: a very successful event.



Jean speaking at the Vienna ICMG in 2009 (photo courtesy Hermann Häusler).

At the 10th ICMG, held in Aviemore, Scotland in 2013, a proposal to found the IAMG was tabled by the convener. Notably, this was at Jean's initiative and supported by a draft constitution that he had prepared. Jean returned for the 12th ICMG, in 2017 in South Africa. At the time, we did not have the slightest notion that his presentation there would be the last of his talks that IAMG members would be privileged to hear.

Jean was born in Canada, in 1956, at Alma in the province of Quebec. He therefore grew up fluent in French as well as English. He graduated in 1982 from the Université du Québec à Chicoutimi with a BA degree in history, and from the Université Laval, in Quebec City, with an MA in geography in 1990, and a PhD in 1995. Appointed a historian at the Directorate of History and Heritage at the National Defence Headquarters in the Canadian capital city, Ottawa, in 2000, he led or participated in several of its projects in Canada and overseas (notably in Afghanistan) and was still employed by the Directorate at the time of his death.

Jean was a delightful, unassuming and highly respected colleague. His wide-ranging enthusiasm for many aspects of research into the history of military geoscience, especially those connected with the Canadian armed forces, will be greatly missed. His death is indeed a sad loss to our community.