



Aeromagnetics, Geology and the Geoscience Database for Africa

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The process of systematic geological mapping of Africa, as established in the first half of the twentieth century, involved heroic periods of field mapping by individuals on single map sheets, supported eventually by interpretation of aerial photography, with the publication of colour maps and reports on paper as the ultimate aim. Despite the advent of satellite imagery in the 1970s, this activity trailed off in the final decades of the century. This was partly due to political changes in Africa but also due to the growing realization that the amount of outcrop available for examination is little to none over great swathes of the continent. Estimates indicate that less than half the sheets that cover the continent had been mapped by about the year 2000, and only half of those mapped had actually reached publication stage. Even then, 'publication' often meant only that paper copies could be purchased from the sales office of a national geological survey, of which there are more than 50.

The second half of the century saw the growing realization that aeromagnetic surveys (that effectively 'saw through' weathering and widespread sedimentary veneers) could accelerate the geological mapping process and provide useful geological reconnaissance of large areas – typically whole African countries – in years rather than decades. With, in some cases, the support of international aid agencies, airborne geophysical programmes have been launched across Africa and, in some countries, re-launched with greater detail as airborne survey technology continuously improved with time. The advent of gamma-ray spectrometry of high resolution delivered a powerful additional tool after about 1990. It is certain that several hundred million dollars have now been invested in programmes of this type across Africa.

It is argued that much of the value of this work has still to be realized. The extraction of geological information from airborne geophysical surveys involves the application of human intellect to the data. That, in turn, requires that the data be easily accessible to all those concerned with the geological reconnaissance of Africa. It is now almost 20 years since the first attempt was made to catalogue, compile and digitize aeromagnetic data across all of Africa (AMMP, 1989-1992). While excellent software tools now exist widely for individuals to work with such data sets, there are still unnecessary obstacles to accessing data on an Africa-wide basis. Africa itself, meanwhile, trails well behind the rest of the world in terms of its connectivity to internet. As a result, the use of current information and communication technology (ICT) as the most effective method of data publication to earth science professionals worldwide is unnecessarily difficult and African geoscientists are increasingly isolated from the global professional community.

This talk pleads for a new, well financed initiative to collate information on African geology, continent-wide, that transcends national boundaries so that the mapping of the geology of Africa and its resources can reach a state of sophistication and understanding that is comparable with the rest of the world. Not least, this is necessary to realize the full value of expensive public sector investments that have already been made. The upturn in geological understanding and sustainable development of resources that would undoubtedly follow should realize tangible benefits to all inhabitants of the continent.