

## RECONSTRUCTING *RANGEA*: NEW TECHNOLOGY AND PALAEOBIOLOGICAL INTERPRETATIONS

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Digital techniques to study fossils have been gaining popularity in recent years. Surface scanning, computed tomography (CT) and synchrotron scanning can provide insight into the structure, function and ecology of extinct animals in a non-destructive way. *Rangea* is the type genus of the Rangeomorpha, an extinct clade near the base of the evolutionary tree of large, complex organisms which radiated during the late Neoproterozoic. *Rangea* was probably an epibenthic frond that rested upright on the sea bottom, and all known fossil specimens were transported prior to their final burial in storm deposits. *Rangea* specimens are rare and sometimes very fragile making it difficult to produce an accurate reconstruction. The discovery of well preserved specimens from Farm Aar in southern Namibia reveal the internal and external features of these animals, permitting new interpretations of *Rangea* morphology and lifestyle. Several of these specimens were scanned using synchrotron and high definition surface scanning to examine in more detail. Surface scanning allows us to magnify and visualise the external structure of fossils in incredible detail, and from these surface scans we can produce 3D models that can be printed in plastic or resin, replicated, and shared between institutes. In addition, CT and synchrotron scanning provide ways to visualise the internal anatomy of fossils. Faint features can be seen in the synchrotron scans of *Rangea* that may be the boundaries between internal structures such as the vanes that are arranged radially around the hexaradial axial bulb. This may provide further insight into the internal structure of *Rangea* and its palaeobiology.