Bristol Naturalists' Society

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BNS Geology Section

The next meeting will be held on January 23rd at 7.30pm in the Wills Memorial Building,

Speaker
Dr. Philip S. L. Anderson

Title
An exploration of paleobiomechanical methods: Cranial mechanics, tooth function and ecological diversity in Late Devonian arthrodire placoderms.

Synopsis
Paleobiomechanics is a growing field in paleontology. Understanding the mechanics and function in fossil organisms is becoming more important as scientists grapple with questions of what underpins patterns of diversity in the fossil record, and how large scale events such as mass extinctions have affected the global fauna over time. In this talk, I explore several analytical biomechanical techniques as they relate to a group of early jawed vertebrate: the arthrodire placoderms. Computer modeling of cranial mechanics in arthrodires shows a linked system of cranial lift and jaw depression which combine both a fast opening and a powerful bite, amongst the largest ever calculated. Actualistic experiments on tooth design indicate that certain arthodire dental shapes were ideal for cutting through almost anything in their environment. Finally, a large scale functional diversity analysis suggests that the ecology of fossil fish faunas may not have been that different from modern ones.

Biography
Dr. Philip S. L. Anderson received his B. A. in Geology with honours from Carleton College and his Ph. D. in Geophysical Sciences from the University of Chicago. Studying under the tutelage of Michael LaBarbera, Michael Coates and Mark Westneat, he completed his thesis entitled: "Biomechanics and Functional Diversity in the Feeding System of Late Devonian Arthrodire Placoderms." He is currently a Post-Doctoral researcher at the University of Bristol working with Emily Rayfield on the diversity of tooth design in early vertebrates.