siltstone and claystone, is dominated by even, uniformly-thick bedding, rhythmic lamination, oscillation ripple marks, graded bedding and disturbed bedding. Such features in combination suggest that the Del Haven Facies represents lacustrine deposition below wave base. In contrast, the Digby Facies of the basal Blomidon Formation is characterized by the same 5 primary structures and lithologies in combination with groove casts, lenticular cross-stratification, ripple stratification, current ripple marks, groove casts, flute casts, raindrop imprints, salt casts and oriented plant fragments. The Digby Facies is inferred to represent a periodically-exposed plain of coalescing deltas near the shores of "Lake Blomidon."

Modal analyses of 85 thin sections of sandstones from the Wolfville Formation indicates that orthoquartzite, low-rank graywacke, high-rank graywacke, impure arkose and arkose are present. Low-rank graywacke is limited to those areas where the Wolfville overlaps Lower Paleozoic metamorphic rocks and Mississippian sediments. High-rank graywacke, impure arkose and arkose occur where the Wolfville overlaps Devonian granites and their associated contact aureoles. Orthoquartzites are found where the Wolfville overlaps or is in fault contact with Pennsylvanian sandstones.

Mapping of 2443 cross-bedding directions at 67 localities suggests that the different sandstone types were derived from the pre-Triassic rocks surrounding the depositional basin and that lateral variation in sandstone composition is controlled by lateral changes in source-area rock composition.

Comparison of the sandstone composition of the Wolfville Formation with ancient sandstones and modern marine sands supports the conclusion that source-area composition, rather than tectonics, controls the composition of ancient and modern sandstones.

GEOLOGICAL HISTORY OF OKLAHOMA'S VEGETATION

L. R. WILSON[1]

The recorded history of Oklahoma's vegetation begins in the Cambrian Period some 750 million years ago and is traceable to the present. The earliest known fossil plants in the State are marine algae extensively exposed in the Arbuckle Mountains. Presently Oklahoma's oldest reported land vegetation is Devonian and one of the largest known Devonian tree fossils was found near Ada. During Carboniferous time coal-forming swamps were numerous and the ancient vegetation, now coal, has contributed much to the wealth of the State. Permian time was arid but a rich fossil flora indicates that the State was not entirely a desert as might be supposed from the redbed nature of most of the Permian rocks. In the latter part of the Mesozoic Era the vegetation evolved into modern types. Fossils of these are present in the Cretaceous rocks of northwestern Oklahoma. The early Tertiary vegetation was subtropical but toward the end of that time became more like that of the modern prairies. During the Glacial Period northern forests migrated southward and remained until the ice in the north was melted. The present vegetation is a complex of southern, western, eastern and northern floral elements. The accompanying chart is a summary of Oklahoma's vegetation through geological time.

---

[1] Prof. of Geology, Univ. of Okla.

SUMMARY OF OKLAHOMA'S VEGETATIONAL HISTORY

	Geological Time	Physical Conditions	Nature of Paleobotanical Records	Vegetation
Cenozoic	Pleistocene	Cool to warm Erosion north of Oklahoma	Peat, silt, volcanic ash Relict communities	Prairie types Oak-hickory Beech (?)-maple Pine-hemlock (?) Spruce-pine
	Pliocene	Cool Erosion	River deposits, volcanic ash Seeds	Conifers, dicots, monocots (prairie types)
	Miocene	Cool to warm Erosion	Inferred from adjacent states	Ferns, conifers, dicots, monocots
	Oligocene	Cool to warm Erosion	Inferred from adjacent states	Ferns, cycads, conifers, dicots, monocots
	Eocene	Warm Erosion	Inferred from adjacent states	Ferns, cycads, conifers, dicots, monocots
	Paleocene	Cool to warm Erosion	Inferred from adjacent states	Ferns, cycads, conifers, dicots, monocots
Mesozoic	Cretaceous	Warm Marine and coal swamps	Coal, shale, limestone Wood, leaves, spores, reefs	Algae, ferns, cycads, conifers, dicots, monocots
	Jurassic	Erosion, continental deposition	Inferred from adjacent states	Algae, ferns, cycads, conifers,
	Triassic	Erosion	Inferred from adjacent states	Ferns, cycads, conifers
Paleozoic	Permian	Cool to warm Marine in west, deltaic in central	Redbeds, shale, sandstone Leaves, spores, pollen, reefs	Algae, lycopods, ferns, *Calamites,* pteridosperms *Cordaites,* conifers
	Pennsylvanian	Warm Marine and coal swamps	Coal, shale Leaves, seeds, wood, spores, pollen, reefs	Algae, lycopods, ferns *Calamites,* pteridosperms, *Cordaites,* conifers
	Mississippian	Warm Marine and coal swamps	Coal, shale Leaves, seeds, wood, spores, pollen, reefs	Algae, lycopods, ferns *Calamites*
	Devonian	Warm Marine	Shale Wood, leaf tissue, spores	Algae, ferns, *Callixylon, Tasmanites*
	Silurian	Warm Marine	Shale, limestone	Algae
	Ordovician	Warm Marine	Shales Reefs, spores (?)	Algae
	Cambrian	Warm Marine	Shale	Algae
	Precambrian		Inferred	Algae