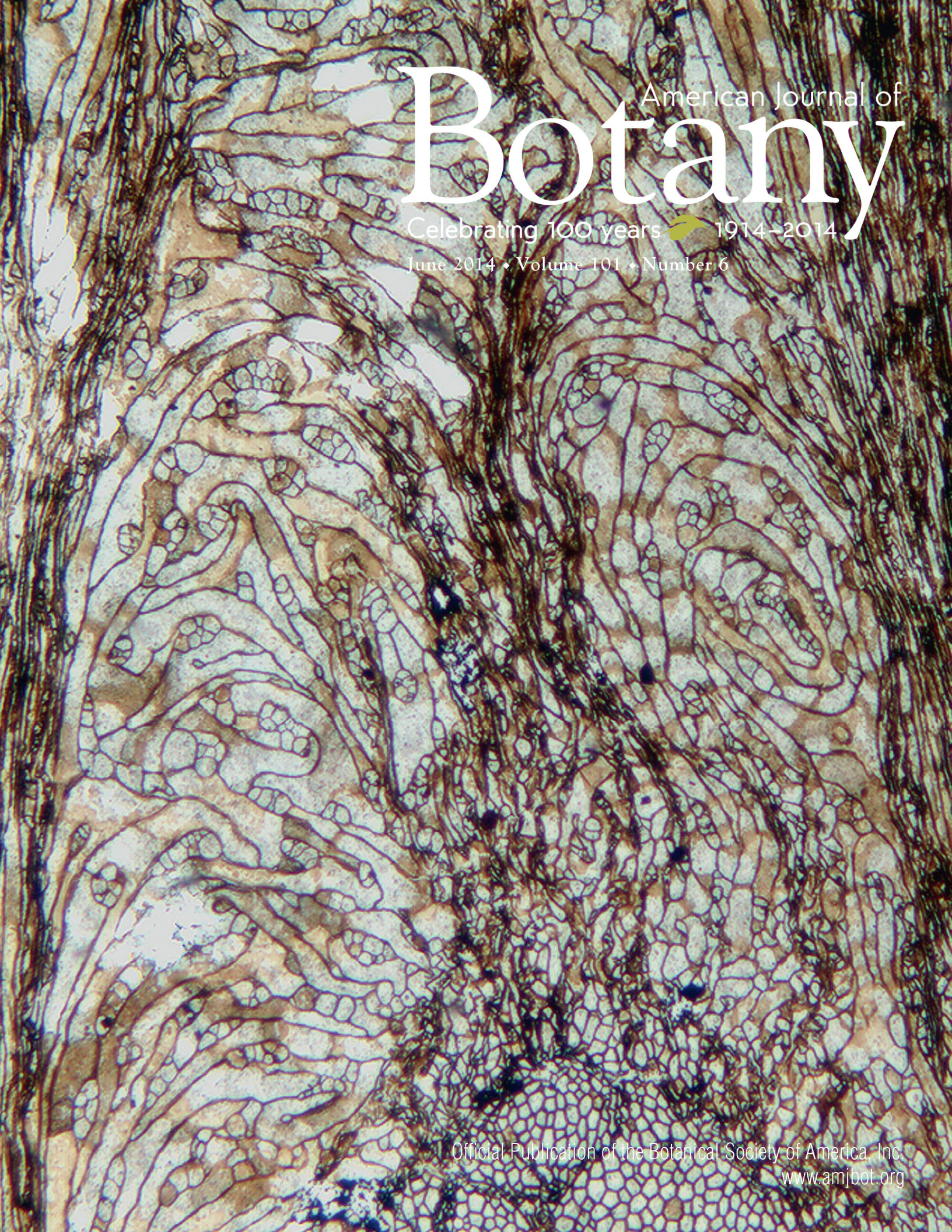

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Celebrating 100 years 1914–2014

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Cover Illustration: Tangential longitudinal section of fossil wood from an Upper Devonian progymnosperm tree, *Archaeopteris* sp. Although *Archaeopteris* and other extinct progymnosperms reproduced by spores, they also developed secondary vascular tissues from a bifacial vascular cambium like that of seed plants. This and other similarities of vegetative growth place progymnosperms and seed plants within the lignophyte clade. Isodiametric cells at the base of the light micrograph are primary xylem tracheids of a branch that is extending through the wood of this 375 million year old tree trunk. In living plants, such branches form an obstacle that disrupts basal (polar) flow of the growth regulator indole-3-acetic acid (auxin) within the vascular cambium, causing auxin to pool;as a result, circular patterns of cells form during wood development. In contrast to the straight tracheids at the sides of the micrograph, cells above the branch of this fossil show the same characteristic circular patterns that reveal disruption of polar auxin flow during wood formationin living plants. This circular pattern is, thus, an anatomical fingerprint of the regulatory genetics of wood development in extinct plants. The common polar auxin regulation of secondary xylem development supports a common origin of wood in progymnosperms and seed plants and further strengthens the lignophyte hypothesis. See the *AJB* Centennial Review by Rothwell et al.—Plant evolution at the interface of paleontology and developmental biology: An organism-centered paradigm, pp. 899–913 in this issue. *Photo credit:* Gar Rothwell. (Note: this image appeared previously in the *American Journal of Botany* [92: 903–906, 2005].)

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Abbreviations

Miscellaneous: AFLP, amplified fragment length polymorphisms; a.s.l., above sea level; bp, base pair; BP, before present; BSA, bovine serum albumin; cpDNA, chloroplast DNA; CTAB, hexadecyltrimethylammonium bromide; cv., cultivar; ddH_2O, double-distilled water; dNTP, deoxyribonucleotide E.C., Enzyme Commission; EDTA, ethylene diamine tetra-acetic acid; f. sp., forma specialis; indels, insertions and deletions; ITS, internal transcribed spacer; LM, light microscopy; mya, million years ago; PAGE, polyacrylamide gel electrophoresis; PCR, polymerase chain reaction; RAPD, random amplified polymorphic dimorphism; SDS, sodium dodecyl sulfate; SEM, scanning electron microscopy; s.l., sensu lato; s.s., sensu stricto; subsp., subspecies; TEM, transmission electron microscopy

Genetics: A, mean number of alleles per locus; D, mean genetic distance; CI, consistency index; F, fixation index; F_{IT}, total deviation from Hardy-Weinberg expectations; F_{ST}, genetic diversity among populations; F_{IS}, inbreeding within populations; G_{ST}, the proportion of genetic diversity among populations; H_e, Hardy–Weinberg expected heterozygosity; H_o, observed heterozygosity; MP, most parsimonious tree; n, individual chromosome number; Nm, mean number of migrants per generation; P_p, percentage of polymorphic loci; RI, retention index; x, base chromosome number

Statistics and math: ANOVA, analysis of variance; CV, coefficient of variation; df, degrees of freedom; N, number of individuals; p, probability; P, level of significance; PCA, principal components analysis; r, coefficient of correlation; SE, standard error; SD, standard deviation