error is used [9], [135, Chap. 12]. UMFPACK relies on the theory and some of the algorithms presented in nearly the whole book.

9. If A is square and full, LAPACK is used.

10. If A is sparse and not square, a sparse QR factorization based on Givens rotations is used (Section 5.5).

11. If A is full and not square, a QR factorization based on Householder reflections is used (in LAPACK).

The x=b/A statement in MATLAB is called the forward slash, or matrix right-division (mrdivide). It is translated immediately into x=(A'\b')', and the above algorithm for backslash is used. Type doc mldivide in MATLAB for more details.

Even with all its host of supporting solvers, the backslash operator in MAT-LAB 7.2 has its limitations. It does not attempt to use iterative methods. It makes no use of ordering methods based on graph partitioning methods, and so its fill-in can be higher than it might be otherwise. It does not use the Dulmage–Mendelsohn decomposition. It uses LU factorization for symmetric indefinite matrices, rather than methods that exploit symmetry.

Gilbert, Moler, and Schreiber [105] developed the original sparse backslash for MATLAB 4.0.