Lysates of human peripheral blood leukocytes that contained acid hydrolases solubilized 65% of the total radioactivity from ^{14}C-labeled *Staphylococcus albus* after incubation for 18 hr at 37 C in acetate buffer, *p*H 5. Under similar conditions only 28%, 5.0%, and 2.5% of the total radioactivity was released from *Staphylococcus aureus*, group A *Streptococcus*, and A-variant streptococci, respectively. While the solubilization of radioactivity from *S. albus* was accompanied by the release of most of the glucosamine and by extensive cellular breakdown, the release of glucosamine and cellular breakdown of *S. aureus* were more moderate. However, no substantial degradation of streptococci was evident. Treatment with trypsin and lysozyme before addition of leukocyte lysates did not increase the solubilization and cellular breakdown of streptococci. However, such treatment greatly enhanced lysis of *S. albus*. Solubilization of radioactivity from staphylococci was accompanied by release of normal constituents of bacterial cell walls, e.g., glucosamine, muramic acid, alanine, lysine, glutamic acid, and ribitol (as revealed by paper chromatography). Under similar conditions, only alanine and a small portion of glucosamine were released from streptococci after treatment with leukocyte lysates. The use of radiochromatography and electron microscopy for study of the interaction of leukocyte enzymes with bacteria may contribute to our understanding of the interrelationship of leukocytes and bacteria.