infection **(Chap. 224)**. All species are transmitted in tropical and subtropical areas by female *Anopheles* mosquitoes. *Plasmodium falciparum* is most common in sub-Saharan Africa, where it causes more than 80% of malaria infections and 90% of malarial deaths. Infection with *P. falciparum* may be particularly severe because the organism can invade any erythrocyte, reaches very high parasite loads, damages organs by adhering to vascular epithelium, and is the most likely *Plasmodium* species to be resistant to antimalarial drugs. *Plasmodium vivax*, the dominant cause of malaria outside sub-Saharan Africa, reaches lower levels of parasitemia and exhibits less drug resistance because it invades only reticulocytes with Duffy antigen. Many Africans, especially in the western part of the continent, lack the Duffy blood group; consequently, *Plasmodium ovale*, another cause of milder malaria, can compete successfully with *P. vivax*. Both *P. vivax* and *P. ovale* produce persistent liver forms, which must be treated with primaquine **(Chap. 222)**. Because malaria can cause a variety of symptoms ranging from acute fever to coma, this diagnosis must be considered in any traveler or immigrant from a malarial area. *Babesia* also infects erythrocytes and may cause a nonspecific febrile illness or, in asplenic patients, severe infection. This parasite is carried by ixodid ticks and is geographically limited to the northeastern and midwestern United States, with only sporadic cases in Europe and other temperate areas.

Trypanosomes The three species of trypanosomes all have flagellated bloodstream forms, but they cause very different diseases. *T. cruzi*, the cause of Chagas disease, is transmitted in South and Central America in the feces of blood-sucking reduviid bugs **(Chap. 227)**. After initial parasitemia, patients are often asymptomatic for years while the parasite multiplies intracellularly in muscle and ganglion cells. Although only a minority of patients go on to develop organ damage (megaesophagus and cardiomyopathy), all infected patients can spread the disease through transfusions, mother-to-child transmission, and organ transplants.

African trypanosomiasis is limited to sub-Saharan Africa, where it is transmitted by the bite of a tsetse fly. A history of a tsetse bite and the presence of a painful chancre are strong diagnostic clues **(Chap.**