

Physics & the History of Bicycles: An example of the interaction of science, industry and society

Dean Zollman
Department of Physics
116 Cardwell Hall
Kansas State Universit
Manhattan, KS 66506-2601
dzollman@phys.ksu.edu
<http://web.phys.ksu.edu>

The forerunner of the bicycle, the Draisienne, was patented in 1818. For about 75 years a variety of frames, drives, wheels, and suspensions were developed for human powered vehicles. Yet by 1897 when a group of 20 African-American soldiers tested the military value of the bicycle in a 3700-kilometer trip, their bicycles looked remarkably like today's mountain bikes. The applications of physics are evident in the evolution from the Draisienne to the diamond-shaped frame which has been the standard from the late 19th Century to today. One might conclude that the diamond frame is the ideal scientific design. Archibald Sharp said as much in 1896. Yet, aerodynamic considerations caused some designers to place the rider in a reclining position. This type of bicycle is called the recumbent. However, the application of physics to technological advances is seldom independent of social political interactions. In 1934 the Union Cycliste Internationale banned recumbent bicycles from competition. This action limited bicycle design for 50 years. Thus, the history of the bicycle makes an excellent vehicle for teaching physics, its application to an industry and the effect of the social situation on that application.