

# A quick demonstration of Newton's third law

Virginia F. Walters and David D. Dreyfuss  
*Western Reserve Academy, Hudson, Ohio 44236*

With an air track, one can devise a very simple but effective demonstration of Newton's third law (preparation time: five minutes).

Take a small air track glider, a plastic ruler with a groove down the center (the kind used in the PSSC experiment "Collision in Two Dimensions"), appropriate shims, tape, or whatever is lying around. Attach the ruler so that it

becomes an inclined slope on top of the glider with a stop at the lower end. When the glider is on the air track, roll a ball down the groove: the glider will start and stop most satisfactorily as the ball starts and stops.

This demonstration may lead to fruitful discussion of conservation of momentum, vectorial property of momentum, and conservation of energy.

## RESCUING A MYTH

In most movie and TV portrayals, such American heroes as Franklin, Jefferson, and Washington move across the screen like scarecrows, uttering their antiseptic lines with such embalmed dignity that one wonders — as Aldous Huxley once wondered about the characters in Henry James novels — "whether they could ever bring themselves to go to the bathroom." After exhaustive research that involved examining more than 300,000 items of memorabilia in the Smithsonian and elsewhere, as well as interviewing three nieces and a nephew of the Wright Brothers, Arthur Barron and National Educational Television tried to put some flesh back on two American legends with their June 1971 production, *NET Playhouse Biography: Orville and Wilbur*.

The Wrights deserve this recreation and reappraisal, for their probable corporate image among most Americans — especially among the academic community — is that of two clever tinkerers who bought their way into the history books by hooking an engine onto a pair of wings about 15 minutes before some other bicycle mechanics would have done so.

Yet Wilbur and Orville were genuine adventurers in both the intellectual and practical realms, students of aerodynamic principles ("The pigeon certainly twists its wing tips so that the wind strikes one wing on top and the other on its lower side," observed Wilbur, "thus by force changing the bird's lateral position") and builders of the first wind-tunnel in which they tested more than 200 wing-surfaces before their first flight. Though neither completed high school, they proved on December 17, 1903, that they had solved the basic problems of motorized flight — lift, power, and control — precisely three weeks after Harvard physicist Simon Newcomb "proved conclusively" to a press conference that it was "flatly impossible for man to fly."

They were, moreover, interesting case-histories in genius; prim bachelors who worked in derby hats and brought 100 starched collars with them from their shop in Dayton to Kitty Hawk, an odd couple who maintained a joint bank account, quarreled over each other's cooking,

and sacrificed every other human comfort to the doctrine — preached by their father, a United Brethren Church bishop — that man found fulfillment only in work. Neither smoked, drank, worked (or flew) on Sunday, nor had much to say; Orville's entire speech at an honorary banquet consisted of two sentences: "Of all the birds, the parrot talks the most and flies the worst. Thank you very much."

### Authentic Heroes

In exhuming these authentic heroes and restoring the blush of life to their mummified memories, two-time Emmy winner Barron and NET hoped to produce an intellectual history that would "get inside the Wright Brothers myth and make a statement about American myths in general."

NET's account — financed in part by NEH and the Andrew Mellon Foundation — drew both raves and raspberries. "The final result," wrote John J. O'Connor in *The New York Times*, "is almost painfully dull. . . a good idea that fails to be realized." Among the many enthusiastic reviews were personal letters sent to NET affiliates, asking how soon the local ETV station would run the program again.

"Although you folks examine, debate, and probe man in all his seasons," wrote a California subscriber, "— crawling in the morning on four legs, upright at noon on two, and supported by a cane on three in the evening — I like the 'Orville and Wilbur' posture the best: man walking tall, standing proud. Although we need long, hard, painful looks at ourselves once in a while, a positive, wind-swept exuberance is allowed too small a fraction of our 1971 day."

The Wrights' dominating, driving, duty-preaching father would have liked that — and he may have supplied the best accounting for his sons' audacity. The bishop once made a flight, holding white-knuckled to the fragile craft while one of his boys navigated the wind. His only recorded words were, "Higher, Higher."

— Humanities, January 1972.