

August 18, 2011

James Watt And The Revolution Of Horsepower

By: Abby Gibbon



The Whitbread Brewery in Chiswell Street, London, 1792.

[MORE PHOTOS](#)

PRINT

SHARE

Stand beside the finish line of any racetrack in the world and dare yourself to remain unflapped. I've tried; it's futile. The pack rounds the turn, and involuntarily your pulse quickens, eyes darting from hooves to outstretched necks to flying manes and tails as the hijinks of the bettors beside you intensify, the final moments igniting in a blaze of speed so fast it almost takes your breath away. You ask yourself: horsepower? Have I just felt the physical effects?

U.S. Equestrian Federation Technical Advisor and Between Rounds columnist Anne Gribbons

recently compared her passion for dressage to her husband's classic car fascination, and it got me wondering about the definition of a term I've always found mystifying.

Horsepower.

Riders know a racetrack isn't necessary for the experience. Swing into any saddle, anywhere, and there you are: A captain at the helm—and mercy—of galloping, volatile, impregnable horsepower.

And yet horses under car hoods have always seemed an abstract, incongruous concept. Just how does a stampede translate to cylindrical explosions, firing pistons? Where do you draw the line from harnessed power to mechanical speed?

London Breweries

Anyone who's visited London's Hyde Park knows that horses are an essential part of the city's history. Fabled [Rotten Row](#), established as a carriageway along the park's south side in the 17th century, is maintained today as a bridleway and used daily by the Household Cavalry and Hyde Park Stables to exercise horses.

But anyone who's seen the tired eyes and too-long toes of overworked carriage horses knows that city life isn't always so glamorous.

In 1750, [Samuel Whitbread](#), forefather of the U.K.-based Whitbread hospitality company, built up a booming enterprise: A porter, strong and dark, brewed at his "Goat Brewhouse" had gained such popularity that he'd been forced to relocate to larger headquarters in Chiswell Street, where he established the first mass-production brewery in England.

The driving force behind breakneck production at Whitbread's brewery?

Horsepower.

With porter in demand, horses had succeeded wind, water and oxen as the most effective, highest-yielding power source for Whitbread's brewery mill, the product of which was the porter's key ingredient: malt powder.

At the Chiswell Street headquarters, six horses were harnessed to spokes radiating from a central mill shaft and prodded to walk the ceaseless circles that powered the grindstones and reduced malt to its powdered state. Large London breweries like Whitbread's are estimated to have employed an average of [20 horses](#) for the mill at once, cheaply acquired and cheaply cared for, with even the aged, blind and infirm expected to earn their keep.

Watt's Initiative

Day in and day out, mill horses circled the shaft, revolving approximately 144 times per hour (2.4 times per minute) if you were to believe the observations of one [James Watt](#), an onlooker of dubious intent.

For Watt, like Whitbread, had a booming enterprise: He'd adapted and marketed a steam engine used to pump water from underground mines and was currently scouting the territory for his latest adaptation—a "rotative" steam engine that he believed could outpace horses as the power source

[VIDEO STREAMING](#)

The CHRONICLE of the HORSE

THE MOST TRUSTED NEWS SOURCE FOR TOP RIDERS SINCE 1937.

[CLICK HERE TO SUBSCRIBE TODAY](#)

PHOTOS

[VIEW MORE](#)


Reach For The Finish Line!

JANUARY 11 – APRIL 2, 2017
www.pbic.com

[JOIN OUR COMMUNITY](#)


for brewery mills.

The hitch? Marketing. Whitbread and his contemporaries had a good thing going with their cheap and laborious workhorses, but Watt knew he had the means to drastically improve production rates. How could he bring them to his side?

An idea struck him. If he couldn't convince them outright, he'd have to put the steam engine's specifications into a context that the brewers understood. Watt had already determined that the horses lapped the mill's 24-foot diameter circle 144 times per hour. For reasons less clear, he estimated that the horses pushed the shafts with a force of 180 pounds. Using a [complicated mathematical equation](#), Watt deduced that a mill horse could push 32,572 pounds one foot in a minute, which he rounded up to an even 33,000 pounds.

33,000 pounds pushed one foot in a minute. The power of one horse. One horsepower! Watt, whose name is synonymous with the unit of power you'll find on your light bulbs—named after him due to his contributions to steam power—had derived a unit of measurement that would stand the test of time. To this day, horsepower is used to describe the output of cars, lawn mowers and even household vacuum cleaners.

Steam Revolution

For Whitbread's purposes, Watt boasted that one of his steam engines could harness the power of 200 horses at once. 200 horses in a single unit, without so much as a stable to house them? Whitbread was sold, and within a year, production had nearly doubled from 90,000 to 143,000 barrels of brew.

Mill horses were kept on briefly should the machines falter, but soon enough Whitbread and his contemporaries had dispensed their teams in favor of Watt's industrious engines. London's breweries had never produced more beer.

In fact, the dispensed mill horses were only a harbinger of what was to come, for the fates of horses and steam power have since been invariably intertwined. Can you imagine, 100 years later, a team of those long-toed carriage horses drinking lazily from a sidewalk trough, blissfully unaware of what was coming around the corner for them? Imagine their eyes at first sight of that jolting, popping, exploding automobile, technology at its most advanced, as it rolled fitfully down the avenue to change their lives—and the future.

And under the hood?

You guessed it.

Horsepower.

As a youngster, Chronicle of the Horse staffer Abby Gibbon was mystified by a black-and-white photo of her grandfather competing in a jumper class in the 1960s. He wasn't wearing a helmet! His saddle pad was non-existent! The wall he was jumping looked like it would knock you down, too, if you happened to knock it! In the past 50 years, the world of equestrianism has evolved, but one thing is still for certain: History is something we all share as horse enthusiasts, and we've got to explore it to learn from it. Armed with nearly 75 years of Chronicle archives, Abby plans to unearth articles we haven't examined for too many years, shedding light on how far we've come – and how far we still have to go – as modern horsemen.

Have ideas for historical topics? Questions or curiosities? Please [e-mail Abby](#) – she'd love to hear from you!

tagged in:
[History Blog](#)



CONTRIBUTORS

[Blogger Lindsey Long](#)

[Blogger Elizabeth Grubbs](#)

[Blogger Lauren Donahoo](#)

[Blogger Lauren Sprieser](#)

[Blogger Erin Rose](#)

[Blogger Chad Oldfather](#)

[Blogger Carleigh Fedorka](#)

[Blogger Kristin Carpenter](#)

[Blogger Susan Glover](#)

[COTH Staff Blog - Molly Sorge](#)

[Blogger Paige Cade](#)

[Blogger Steven Wilde](#)

[Blogger Meghan Holland](#)

[COTH Staff Blog - Ann Glavan](#)

[Blogger Jessica Marie Nemzoff](#)

[Blogger Piper Johnson](#)

[Blogger Jennifer McFall](#)

[Blogger Michelle Craig](#)

[Blogger Camilla Mortensen](#)

[Blogger Taylor Flury](#)

[Blogger Natalie Voss](#)

[« Back On Track](#)

[Confessions Of A Success Junkie »](#)

0 Comments

Sort by [Oldest ▼](#)

Add a comment...

[Facebook Comments Plugin](#)

VOICES

[ASK THE EXPERT](#)

[COLUMNS](#)

[CLINIC REPORTS](#)

[HUNT REPORTS](#)



- [What's In Your Ring? With Shachine Belle](#)
- [Guy McLean In Action](#)



- [We All Need To Make Good Choices For Our Sport](#)
- [You Might Be Able To Dress Us Up, But Can You Take Us Out?](#)
- [Jitterbug's 2016 Letter To Santa](#)
- [The Judge's Card: The Original Emojis](#)



- [Make The Young Horse Proud Of Himself: Wisdom From The USDF Trainers Conference](#)
- [Never Giving Up: Laura Kraut Pushes Riders To Persevere At Horsemastership Clinic](#)
- [Don't Be Afraid To Break: Final Day Of Robert Dover Horsemastership Clinic](#)
- ["Don't Pull, Fix," Says George Morris On Day 2 Of Oregon](#)



- [Hunt Report: Gumbo Flats Gold Cup Stake](#)
- [Tally Slo: The Leisure Field Debuts At Ridgecrest Joint Meet](#)
- [Bull Run Hunt Holds Onto Fox Hunters' Challenge Cup Title](#)
- [Snickersville Hounds Final Hunt Report Of The Season](#)

[◀ PREV](#)



[NEXT ▶](#)

Blogger Sean McQuillan

Blogger Mark Bellissimo

Blogger Jennifer Bliss

Blogger Jennie Brannigan

COTH Staff Blog - Jennifer Calder

Blogger Leah Lang-Gluscic

COTH Staff Blog - Sara Lieser

Blogger Emily Pope

Blogger Laurie Pitts

COTH Staff Blog Mollie Bailey

COTH Staff Blog - Mollie Bailey

Blogger Matt Brown

Blogger Lisa Goldman

COTH Staff Blog - Catie Staszak

Blogger Deloise Noble-Strong

COTH Staff Blog - Lisa Slade

Blogger Catherine Haddad Staller

Blogger Allie Conrad

Blogger Michael Dignelli

Blogger Liz Arbittier

Blogger Ransome Rombauer

Blogger Sinead Halpin

Blogger Anna Corley

Blogger Alex Ambelang

Blogger Tik Maynard

Blogger Erin Gilmore

Blogger Kimberly Kitson

Blogger Priscilla Godsoe

Blogger Lynn Symansky

Blogger Ashley Stannard

Blogger Rebecca Young

Blogger Christiane Campbell

COTH Staff Blog - Kimberly Loushin

Blogger Charlotte Stillfried

Blogger Sydney Collier

Blogger Emily Wagner Miles

Blogger Katy Groesbeck

Blogger Kristin Alexander

Blogger Jennifer Barker St. John

Blogger Octavia Pollock

Blogger Marina Royston

Blogger Kali Francois

Mollie Bailey

Blogger Doug Payne

Blogger Susanna Thomas

Chronicle Staff

COTH Staff Blog - Beth Rasin

COTH Staff Blog - Lindsay Berreth

Blogger Jennifer Whitelaw Shepherd

Blogger Megan Kepferle

Blogger Jamie Krauss Hess

Bloggers Alex Warriner and Janus Marquis

Blogger Alex Warriner

Blogger Laura Graves

Blogger Amanda Steege

Blogger Jesse Richardson

Blogger Devon Kane

Blogger Krista Dietrich

Blogger Haylie Jayne Rolfe

Blogger Peter Atkins

Blogger Ryan Lefkowitz

Blogger Julie Norman

Jesse Richardson

Sara Gonzalez-Rothi

Coree Reuter

Blogger Grace Powers

Blogger Meagan Nusz

Blogger Anna Easton

COTH Staff Blog - Kat Netzler

Blogger Reed Kessler

Jacqueline Brooks

Blogger Jennifer Alfano

COTH Staff Blog - Megan Brinks

Blogger Lauren Billys

Michael Pollard

Blogger Callie Schott

Alex G. Emerson DVM

Beezie Madden

Devon D'Angelo

Brian Murphy

Erica McKeever

Blogger Morgan Geller

Abby Gibbon

Verena Sonstenes-Mahin

Blogger Nat Varcoe-Cocks

Elly Schobel

Elizabeth Howell

Meghan Blackburn

Blogger Kirsten Coe

Emma Ford

Blogger Julie Welles

Jessica Marie Nemzoff

Amy Brown

Barbra A. Reis

Kristen Mohr

Katie Christiansen

Theodore Boris

Emma Johnson

MOST POPULAR

- **Dubai Endurance Remains Problematic As DIEC Venue Reports Five Recent Deaths**
- **Groom Spotlight: Wayne Robertson Is A Horse's Best Friend**
- **Behind The Stall Door With: High Times**
- **Amateurs Like Us: Green Plus Green Equals Black and Blue?**
- **Amateurs Like Us: Life Happens And Ribbons Are A Bonus**

MAGAZINE

Subscribe
Give a Gift
Change of Address
Advertise
Archives
This Week's Issue
Report A Missing Issue
Careers
Meet the Chronicle Staff

NEWS

Press Releases

HORSE SPORTS

ChronicleTV
Horse Shows
Eventing
Dressage
Hunting
Juniors
Intercollegiate
Other Disciplines
2012 Olympic Games
2014 World Games
2016 Olympic Games

HORSE CARE

Veterinary
Tack
Grooming
Breeding
Farm Management
Controversy
Nutrition

COTH STORE

VOICES

Columns
Clinic Reports
Hunt Reports
Blogs
Chronicle Forums
Horse Radio Network

THE CHRONICLE UNTACKED

Current Issue
Archives

DIRECTORIES

Charities
MARKETPLACE

Horses & Ponies
Real Estate
Stallions
Tack & Other
My Classified Ads
Chronicle Store