Buffalo Hunt

International Trade and the Virtual Extinction of the North American Bison

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Buffalo History

• Pre-European contact population of perhaps 20 to 25 million animals.

• Habitat destruction and subsistence hunting slowly removed the populations east of the Mississippi by approximately the 1820s.

• By the 1860s, buffalo only on the Great Plains. West of the the 98th meridian, East of the Rockies.
• Post civil war 1865 population of perhaps 10 million buffalo.

• Completion of Union Pacific Railroad divided the herd into small Northern and large Southern herds.

• Slaughter on the “Great Plains”. Southern herd eliminated from 1871 to 1879. Northern herd eliminated from 1881-1883.

• In a little more than 10 years, population fell from perhaps 10 million to 100.
Who Killed the Buffalo?

- Settlers came, bison habitat was reduced, buffalo numbers fell.
The Army came, wanted the bison dead to “civilize” the Indians, they facilitated hunting, and buffalo numbers fell.

“Kill every buffalo you can... every buffalo dead is an Indian gone.”

Colonel R.I. Dodge
The Railroads came, they created a market for their meat, robes and hides, they facilitated hunting, and buffalo numbers fell.
New rifles came, allowing hunters to shoot from 600 yards away and kill 100 buffalo in a “stand”. The Sharp’s Big 50 facilitated hunting, and buffalo numbers fell.
Whiskey and White traders altered Native hunting practices. Native hunting & drought killed the buffalo.
Hollywood’s interpretation

https://www.youtube.com/watch?v=O9Sz2TGXuiM
What needs to be Explained?

• Why was the slaughter a slaughter?

• Why didn’t prices adjust to limit the slaughter?

• Where did all the buffalo products go?
The Frontier Economy

- Large number of potential hunters
- Hunters differ in hunting skill
- Hunters hunt or work on the railroad, on cattle ranches, or farm.
- Killing is easier if the herd is larger
- No regulation of buffalo kill
- Natural growth of the buffalo plus killing determines the herd size.
Production Possibilities Frontier

Four types of Hunters

Other Goods

Buffalo Products

100
80
60
40
20
600 1200 1800 2500
Slope = rise/run

\[ \text{Slope} = \frac{-20}{1200} = -\frac{1}{60} \]

Slope = \(- \frac{\text{MP}_x}{\text{MP}_b}\)

\[ \text{Slope} = -\frac{20}{600} \]

\[ \text{Slope} = -\frac{1}{30} \]
Many types of Hunters

Slope = \(-\frac{MP_x}{MP_b}\)
To Hunt or Farm

• Let $P_b$ be the value of products you get from a buffalo kill; let $P_x$ be the price you get from selling one day’s output from farming.

• Total Earning if Hunting for one day equals: $P_b \cdot MP_b$

• 60 buffalo hides, 2$ hide = 120 $
• Total earnings if Farming for one day equals: \( P \times MP \)

• 1 bushel of wheat, 25\$ bushel = $25

• Skilled hunters must hunt, since
  \[ P_b \times MP_b > P \times MP \]
  \[ $120 > $25 \]

• Bad hunters must farm, since
  \[ P_b \times MP_b < P \times MP \]
  \[ $20 < $25 \]
• Some hunter must earn the same amount in each occupation, and be indifferent.

\[ P_b \, MP_b = P_x \, MP_x \]

• This implies the marginal hunter is one where:

\[ P_b / P_x = MP_x / MP_b \]

• The marginal hunter is found at the point where the slope of the PPF and price line are the same.
All points above
\[ P_b \, MP_b > P_x \, MP_x \]

All points below
\[ P_b \, MP_b < P_x \, MP_x \]
Summary

• Point of production along PPF is at the tangency of the price line.

• In this model, number of hunters and number of people in X can be read off the PPF.

• As prices change, the marginal hunter changes.
All other Goods

X*

B*

Buffalo Products

X*/B*

Pb/Px
Equilibrium

Equilibrium

\[ \frac{P_b}{P_x} \]

\[ B^*/X^* \]
Equilibrium

$X^*$

$P_b/P_x$

$B^*$

Buffalo Products
Summary

• Frontier Economy represented in a PPF
• Two activities: Hunting or everything else
• Price of buffalo products determines how much effort is expended hunting
• Equilibrium price is where supply equals demand
• We operate somewhere along the PPF.
1870

- Hunting is not excessive. It is just for meat and in the winter for robes.

- The equilibrium shown may have just repeated itself year in and year out.

- The Buffalo herd was shrinking but very slowly.
What happened in 1871?
The Innovation

- Tanners in England, Germany and perhaps France discovered how to tan buffalo hides into useful leather.

- Buffalo leather could then be used for industrial belting and for sole leather.

- This new use for buffalo, raised the value of a kill tremendously. Pb/Px Rises. Demand must now include demand by Europe.
BUFFALO HIDES.—Some eight or ten months ago a few enterprising New Yorkers conceived the idea that the buffalo hides might be tanned for leather, so they went to the West and procured all the hides they could, and sent them to this city and Baltimore to have their exact value ascertained. These hides were sent to several of the more prominent tanners, who experimented upon them in various ways, but they met with no success. Either from want of knowledge or a lack of proper materials, they were unable to render the hides soft or pliable, and therefore they were of no use to them. Under these circumstances several bales of these hides were sent to England, where they were readily taken up, and orders were immediately sent to this country for 10,000 additional hides. These orders were fulfilled, and since then the trade has continued. The first lots that were sent out were bought upon this market at 10c. per lb., and readily brought in England 10d. sterling. The great difference between the price of these and other hides will undoubtedly account for the manner in which they were taken up; but as far as their practical value is concerned the matter is different. The American tanners were unable to make anything out of them, and it is not positively known now to what use these hides are put in England. It is supposed, however, that when tanned they are split and used for carriage tops or for patent leather. However this may be, the English dealers are coming to the conclusion that the hides are not so valuable as they at first supposed, for the price has declined materially, and now these hides sell in the English market at only 6d. per lb. Notwithstanding this decline, the trade continued good. The hides are collected in the West by the agents of Eastern houses; they are simply dried, and then forwarded to either New York or Baltimore for export. The dealer realizes but a small profit, for the excessive cost of railroad transportation, and the cost of hauling; them in many instances to the railroad for shipment, reduces the margin materially. The low price that these goods have reached on the English market, and the prospect of a still further decline, may in time put an end to this trade, but at present the hides are hunted for vigorously, and, if it continues, it will take but a few years to wipe the herds out of existence.—New York Bulletin.
What does Economic Theory predict?

- Two time frames.

- Short run: when hunters adjust to new profit opportunities.

- Long run: when the buffalo population adjusts to reflect the greater killing.
As I came back in camp, I told the other fellers it was getting too warm too get the meat to market without spoiling. They says, "Why don’t you just skin them and let the meat lay". I says, "What the devil would I do with the hide"? So they said, "Ship it to W.C. Lobenstein in Leavenworth and he will send me a check". So next day, Burdett and I went a skinning.
New Equilibrium
Demand equals Supply

\[
P_b/P_x
\]

\[
B_d/X_d
\]

\[
B_s/X_s
\]
Trade in Buffalo Hides

Exports

$P_b/P_x$

$B_d/X_d$ $B/X$ $B_s/X_s$
Short Run Predictions

• Huge Increase in Buffalo kill

• Large movement of people from other occupations to Buffalo Hunting.

• Movement up the buffalo supply curve.
Trade in Buffalo Hides

Exports

\[ \frac{P_b}{P_X} \]

\[ \frac{B_d}{X_d} \quad \frac{B}{X} \quad \frac{B_s}{X_s} \]
Predictions

• Higher price for Buffalo products raises the supply of Buffalo products – hides.

• The gap between Demand and Supply represents Exports of Buffalo hides.

• Total demand is local demand for meat and robes plus hide exports = total supply.
Long Run Predictions

• As the herd is killed off, less buffalo could be harvested.

• A smaller herd means the economy’s production possibilities frontier shifts inward.

• A smaller herd means the economy’s relative supply curve shifts inward as well.
Buffalo Products
Trade in Buffalo Hides

Exports

$P_b/P_x$

$B_d/X_d$  $B_s/X_s$
Trade in Buffalo Hides

Exports

$P_b/P_x$

$B_d/X_d$  $B_s/X_s$
Trade in Buffalo Hides

Exports

$\frac{P_b}{P_x}$

$\frac{B_d}{X_d}$ $\frac{B_s}{X_s}$
Prediction

• Over time exports should fall as the buffalo are wiped out.

• Hide prices should remain constant even as the herds are extinguished.
My Answers

• Why was the slaughter a slaughter?
  Tanning innovation

• Why didn’t prices adjust to limit the slaughter?
  US was price taker on world market

• Where did all the buffalo products go?
  France, Germany & the U.K.
The Evidence
“Had there been a deliberate plan for the suppression of all statistics relating to the slaughter of buffalo in the United States, and what it yielded, the result could not have been more complete barrenness than exists to-day in regard to this subject. There is only one railway company which kept its books in such a manner as to show the kind and quantity of its business at that time. Excepting this, nothing is known definitely.”

William Temple Hornaday, Smithsonian National Museum Washington, 1889
Existing Empirical Evidence
Colonel Dodge’s 3 Numbers

- Some numbers from Northern shipping points.
The Construction of Buffalo Hide Exports

- **Texas, Oklahoma, New Mexico Slaughter**
- **Montana Slaughter**
- **Kansas Slaughter**
- **Southern Herd Gone**
  - 5,000,000 exported
- **Northern Herd Gone**
  - 1,000,000 exported
- **Tanning Innovation**
Evidence from Exports

• Relative size of Northern versus Southern herd accords with other accounts.

• Approximate kill for exports is 9 million over the entire period.

• Export data shows exports to U.K. boom first, followed by Germany and then France.
Evidence from Prices
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<th>H.P.</th>
<th>Year</th>
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Notes: W.P. is hide prices found using the Warren and Pearson price index. N.Y. is hide prices found using data drawn from the Annual NY Chamber of Commerce reports. H.P. is the price-to-hunters series.
Evidence from Business Records
HEPBURN & GALE, MANUFACTURERS OF
WIRE-SEWN AND OTHER MACHINE BANDS,
LEATHER HOSE PIPES, CUP & HYDRAULIC LEATHERS.

Prepared HIDE LACES, Strap Butts, Sole Butts, Pipe Butts, Walrus and Hippopotamus Hides, and Leather Goods for all Mechanical purposes, and for Ships' use.

Their "Composite" Double Band of LEATHER and Prepared HIDE will bear more strain than any other Band, and will stretch much less.

SINGLE, DOUBLE, AND COMPOSITE WIRE-SEWN LEATHER BANDS FOR PORTABLE ENGINES.
INDIA RUBBER BELTS, AND RUBBER GOODS FOR ALL MECHANICAL PURPOSES.

Their WATERPROOF LEATHER for PUMP BUCKERS retains its shape, and remains perfectly solid in water. It is in general use in Mines and Collieries, and may be had of all Dealers in Leather. Each Butt bears the above stamp. EXCELSIOR COMPOUND, FOR PRESERVING LEATHER BELTS AND INCREASING THEIR GRIPPING POWER. "Effects a large saving of Power." "Were the uselessness known, the use of it would become general in all Manufactories."—Trade Testimonials.

LONG LANE, SOUTHWARK, LONDON, S.E.

85 M—l-a
JOHN TULLIS & SON,
TANNERS, CURRIERS, AND
LEATHER BELT MANUFACTURERS.

SPECIAL MACHINERY FOR MANUFACTURING MAIN DRIVING BELTS. ALL STRAPS INDIVIDUALLY STRETCHED & TRIMMED BEFORE FITTING UP

The Leather we use is all Oak Bark Tanned, and being from the primest of Native Fresh Hides, is necessarily of the best selection and description possible, well grown and well seasoned.

Our Manufactory embraces:—Benting, both Single and Double, with Lace Sewing, Wax Thread Sewing, Copper Wire Sewing, Copper Riveted, or Cemented only, just as may be required; Hose Piping, light and heavy, for Brigade and other purposes; Pump Butts; Press Butts; Picking Bands (Oak Tanned and Green); Skips; Crown, Antelope, Cordovan, Cowhides and White Laces; Leather and Buffalo Pickers of all kinds and dimensions, with every variety of Mechanical Leathers generally.

We are the largest Makers in the Trade. Our Works, in extent and thorough completeness and efficiency of productive facilities, are unsurpassed.

* * Manufacturing Mechanical Leather has been our Sole Business for Forty Years. * *

PRICE LISTS AND SAMPLES ON APPLICATION.

ST. ANN'S LEATHER WORKS, GLASGOW.
Manchester Office, 6 New Market Lane—EDWARD ASHWORTH, Manager
On Thursday next, the 29th instant, at Twelve,
At the PUBLIC SALE ROOM, 14, Cook-street,

750 Dry River Plate HORSE
520 Dry West India
3180 Dry East India BUFFALO
9500 North American BISON
1850 Salted River Plate OX and COW
1000 Salted West Coast
860 Salted North American OX and COW
1200 East India KIPS,
288 Sides Oporto LEATHER.

Apply to GOAD, RIGG & CO. Brokers.
28, Exchange-street East.

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On Thursday next, the 29th instant, at Twelve,
At the PUBLIC SALE ROOM, 14, Cook-street,

1700 Dry River Plate HORSE, &c.
5000 Dry Mexican OX and COW
100 Dry West Coast COW
600 Dry Salted Brazil COW
3000 Dry Singapore BUFFALO
1000 Dry Singapore COW
3000 Dry BISON
8000 Salted American OX and COW
1000 Salted American PIG
1000 Dry American CALF

Apply to JAMES GORDON & CO. Brokers.
Hamburg, Sept. 7.

Hides.—Imports during the past two weeks 29,368, and 353 bales kids. Sales, 12,162; hides, 24 bales kips; stock, 47,000 hides and 46 bales kips. Latest quotations $1 2-10 American lbs (1 lb German): Dry Buenos Ayres and Montevideo heavy, 21@26c; do light, 19@33c; do Rio Grande and Rio Janeiro heavy, 20@21c; do light, 19@20c; green salted Buenos Ayres heavy bull, saladero, 16@17c; do cow, 13@14c; do horse $2 60@$3 08 $ hide; green salted Montevideo and Uruguay heavy bull, saladero, 15@16c; do cow, 12@13c; do Rio Grande, heavy bull, saladero, 12@13c; do cow, 11@12c; do horse, $2 37 @$2 60 $ hide; dry North American and Texas, 15@17c; do bison, 7@9c; green salted do, 7@9c.

—J. & M. Popert's Price Current.
1 Coffee Pot
2 Card Powder
2 2 Pots

To bush Oates Hooky

8 8 for salt Walton

To 8 45 1/2 Meat-

By 10 80 Corn
Palo Pinto, Texas.

Keeps none but the best of Wines, Liquors and Cigars.

W. C. Lobenstein,
J. L. Hickey Agent.

Fort Worth, Texas,

Pays the highest prices in cash for Bison and Beef Hides, Pelttries, Furs and Wool.

Henry Warren.

J. L. Kane,
Cashier.

Henry Warren & Co.
Who killed the Buffalo?

• Tanning Innovation created in Europe

• Robust demand comes from Europe

• Are Europeans responsible for the most shameful event in US Environmental history?
Not quite!

- US policymakers are complicit but not causal.
- Railroads were helpful but probably not critical.
- New rifles helped, but hunt led to new rifles not the reverse.
- Little evidence that environmental change or native over hunting did much at all.
Conclusion

• Standard accounts of the “Slaughter on the Plains” are incomplete.

• Empirical evidence strongly in favor of the export driven slaughter explanation.

• Economics is a powerful tool for understanding the world.
STILL-HUNTING BUFFALOES ON THE NORTHERN RANGE.

From a painting by J. H. Moser, in the National Museum.