

Fodder share of supply tonnage: a published refusal

The ratio cannot be computed. What can be computed instead refutes the source that asked for it.

MEASURE CLASS

1 — corpus diagnostic

REGISTERED

2026-09-09

STATUS

Refusal published · figures pending source verification

FALSIFIER

\$7

Abstract. An army before about 1940 moved forward, every day, a tonnage of things it needed to survive and fight. A common claim is that most of that tonnage was horse food. This paper set out to state that claim as a measured ratio for a named force and could not, and the refusal is the result. Two things are missing and neither is on this machine. There is no *total supply tonnage* anywhere in the estate broken down per man or per horse — ammunition, fuel, ordnance and equipment appear in no per-head row — so the only denominator available is food and fodder, which is a different and much smaller quantity. And there is no named force: the only composition on the machine is two hardcoded cells in a spreadsheet with no army attached, no date and no source. What is published instead is a **class 1 corpus diagnostic** — a complete census of one small, fully enumerated body of rows, making no claim about anything outside it — over all 18 rows of the logistics sheet those cells sit in. It finds that the workbook's two headline claims are both refuted by the workbook's own numbers, and that the point at which the majority claim flips is **278 horses per 1,000 men**, four per cent above the ratio the workbook itself uses. This paper makes no claim about any real army, in any period. All figures are unsourced scaffold and are marked as such.

1 Background

Feeding a horse is expensive in a way that is easy to state and hard to measure. A horse eats several times what a soldier eats, and an army that moves on horses is therefore an army that spends a large part of its daily carrying capacity on hay and grain rather than on bullets. That much is genuinely well established and no serious reader disputes it.

The trouble starts at the second sentence. The claim is almost always made as a *share* — fodder, meaning the hay and grain fed to horses and draught animals, as a fraction of total supply tonnage — and a share needs a denominator. **Supply tonnage** means everything moved forward to sustain a force for one day: rations, fodder, ammunition, fuel, ordnance, engineer stores, medical stores, replacement equipment.

Subsistence tonnage means only the part of that which is eaten. These are not the same number and they are not close. A share computed over the second and reported as the first is not a slightly optimistic figure; it is a different quantity wearing the wrong name.

The strongest argument against publishing this refusal deserves to be stated at full strength before any data appear, because it is a good argument. It runs: *everyone already knows horses dominated pre-mechanised logistics; the qualitative claim is not in doubt; refusing to give a number because the denominator is imperfect is pedantry that leaves the reader with less than they started with, and a rough figure with a caveat serves them better than a lecture about denominators.*

That argument would be right if the gap here were a matter of precision. It is not. The gap is that the quantity in the numerator and the quantity in the denominator would have to come from different measurements, and one of those measurements does not exist anywhere in this estate in any form, at any confidence. The difference between the computable share and the briefed share is not a margin of error — it cannot even be bounded, because no row constrains how much ammunition and fuel a pre-mechanised army moved per head. A number with an unbounded error in a known direction is worse than no number, because it will be quoted without its qualifier.

So this paper does two things. It refuses the briefed ratio and says precisely what would unblock it. Then it publishes the thing that *can* be established from the same rows, which turns out to be sharper than the ratio would have been: the workbook that asserts the majority claim contains, in its own cells, the arithmetic that refutes it.

2 Claim, class and preregistration

Two claims are registered. The first is the one that was briefed; it is registered so that its refusal is on the record rather than quietly dropped. The second is what the rows actually support.

Claim A — registered, and refused

For a named pre-mechanised force, fodder constitutes the majority of daily *supply* tonnage.

Measure class 2 — a comparison across named cases — which is what it would have been. It fails before reaching a decision rule, for two independent reasons given in §5: no total-supply denominator exists, and no named force exists. One unsourced hypothetical force is not a named set, so class 2 cannot be reached either.

Claim B — registered, and tested

The workbook's own two headline assertions about fodder are supported by the workbook's own rate rows.

Measure class 1 — a corpus diagnostic. The population is the complete set of 18 rate rows in one sheet, enumerated in full, and no claim is made about any army, any period, or any body of rows outside that sheet. It is not class 2, because the units of analysis are spreadsheet rows and not named historical forces. It is not class 3, because no population claim of any kind is made.

Decision rule for Claim B, stated before counting

Claim B stands if **both** hold. (i) The multiple asserted in the workbook's read-me — that a horse eats roughly ten times a man — is reachable at some corner of the sheet's own food and fodder bands. (ii) The majority claim holds at **both** ends of the resulting share band for the only force composition the workbook supplies. Claim B is refuted if either fails. A band straddling one half is a failure of (ii), not a partial success: a quantity that is above a half at one end of its range and below it at the other has not established which side of the half it is on.

Scale type of every variable

Each rate band is **ratio scale** — a scale with a true zero, on which division is meaningful — but only within its own unit. No arithmetic is performed across units: kilograms per day, litres per day, kilometres per day, tons per day, tons per sortie and rounds per gun are six incommensurable quantities and are never summed. `rate_key` is nominal. The row that reads 0–0 is not on any scale at all; it is a not-applicable, and is handled in §4 rather than averaged.

The decision rule above was written before the two tests were run, but not before the sheet had been read — the rows were read while establishing that the denominator was absent. That ordering is a real threat and is recorded as such at §6.4 rather than glossed.

3 Admission rule

Class 1 is only honest when the population is small enough to enumerate completely, so the admission rule below is a completeness rule rather than a selection rule. It is stated as numbered criteria and then applied.

1. The row lies in the sheet named `logistics_rates` of `command-and-tactics.xlsx`, below the header row.
2. The row carries a non-empty `rate_key`. A row with data and no key would be a defect and is checked for; none was found.
3. **Every** qualifying row is admitted. No row is excluded for being inconvenient, ill-defined or unusable; a row that cannot be used is admitted and then marked unusable in the table, where the reader can see it.
4. Completeness is verified against the sheet's own count and not against the reader's trust: the summary sheet holds `=COUNTA(logistics_rates!$A$2:$A$400)`, a formula that counts non-empty keys, and it returns 18. The count returns 18, with zero wholly-empty rows skipped and zero rows carrying data but no key.
5. The two rows entering the arithmetic were named in advance and are `man-food` and `horse-fodder`. No third row was substituted after the result was seen.

How the set was actually found, stated plainly. It was not found by search and it was not selected. The sheet *is* the population, which is the only reason a class 1 design is available here at all. One warning belongs with that, and it is the reason this paragraph exists rather than a line in a footnote: the same workbook is present at two paths on this machine, and reading both would look like corroboration. It is not. The two files are byte-identical — sha256 beginning `d8af5fdf365ff1ac` for both — so they are one extraction path in two coats, and are counted here as one.

RECOMPUTE

```
python ops/command_supply.py python ops/command_supply.py --drill # 27/27
```

4 Data

Table 1 is the complete admitted set: all 18 rows, in the sheet's own order, so that the enumeration can be checked against the source line by line. Every quantity carries the unit it is measured in, the basis it is measured over, and a confidence.

Confidence is uniform and low for a stated reason. The workbook's own read-me says of these rows: *"Logistics figures are order-of-magnitude bands drawn from general knowledge and need a named source before publication."* Every row is therefore **T0** — the estate's lowest evidence tier, meaning a figure asserted by a source rather than observed, replicated or derived. The bands are published as bands, low to high, because that is how the source gives them.

Table 1. The complete `logistics_rates` sheet, 18 rows, none excluded. Row count verified against the sheet's own `COUNTA` formula, which returns 18. Units are never combined: the six unit families in this table are incommensurable and no total is taken across them. Confidence is T0 throughout, on the workbook's own statement about itself.

RATE KEY	MEASURE	BAND	UNIT	BASIS — WHAT ONE UNIT IS MEASURED OVER	CONFIDENCE
man-food	Food, one soldier	1.5–2.5	kg per day	One man-day. Rations only; water excluded. Strength basis undeclared by the source.	T0 scaffold
man-water-temperate	Water, one soldier, temperate	3–5	litres per day	One man-day, drinking and cooking. Wet, not dry tonnage.	T0 scaffold

RATE KEY	MEASURE	BAND	UNIT	BASIS — WHAT ONE UNIT IS MEASURED OVER	CONFIDENCE
man-water-hot	Water, one soldier, hot climate	8–15	litres per day	One man-day in hot climate. Climate threshold undefined.	T0 scaffold
horse-fodder	Fodder, one horse	9–14	kg per day	One horse-day, hay and grain. One band over draught, cavalry and pack animals undivided , which do not eat alike.	T0 scaffold
horse-water	Water, one horse	20–40	litres per day	One horse-day. Wet, not dry tonnage.	T0 scaffold
march-foot	March rate, foot, sustained	20–30	km per day	One formation-day, sustained. Distance, not tonnage.	T0 scaffold
march-foot-forced	March rate, foot, forced	40–60	km per day	One formation-day, forced; source states not sustainable beyond a few days.	T0 scaffold
march-cavalry	March rate, mounted, sustained	30–50	km per day	One formation-day, mounted; limited by the horse, not the rider.	T0 scaffold
march-motor	March rate, motorised road	150–300	km per day	One formation-day on road, unopposed.	T0 scaffold
march-armour	Advance rate, armoured, opposed	15–40	km per day	One formation-day, opposed advance.	T0 scaffold
rail-throughput	Rail line throughput	1,000–3,000	tons per day	One line-day, single track. Capacity of a route, not consumption of a force.	T0 scaffold
truck-road	Road throughput, one route	500–2,000	tons per day	One route-day. Capacity, not consumption.	T0 scaffold
division-ww2-us ►	Supply, US infantry division in combat	500–650	tons per day	One division-day, all classes of supply . NO MEN COUNT, NO HORSE COUNT — cannot be decomposed into a fodder share.	T0 scaffold
division-ww2-ger ►	Supply, German infantry division	200–300	tons per day	One division-day, all classes; source notes substantially horse-drawn. NO MEN COUNT, NO HORSE COUNT .	T0 scaffold

RATE KEY	MEASURE	BAND	UNIT	BASIS — WHAT ONE UNIT IS MEASURED OVER	CONFIDENCE
division-napoleonic ▶	Supply, Napoleonic corps	0–0	tons per day	NOT APPLICABLE, WRITTEN AS A NUMBER. The corps lived off the country; the zero encodes "no supply column", not "zero tons". Blocked from summing, averaging and ranking.	Unusable
airlift-ju52	Airlift capacity, one Ju 52	1.5–2	tons per sortie	One sortie. Per-aircraft capacity, not a daily rate.	T0 scaffold
ammo-artillery ▶	Artillery expenditure, active day	20–100	rounds per gun	One gun-day. ROUNDS, NOT TONNAGE — no shell weight and no gun count anywhere, so it cannot be converted to weight. This is the estate's only ammunition rate.	T0 scaffold
port-throughput	Deep-water berth	1,000–3,000	tons per day	One berth-day; source states cranes and clearance are the limit, not depth. Capacity, not consumption.	T0 scaffold

Four rows are marked. Together they are the whole of the refusal in §5, and they can be read off the table without any argument from me. Three rows carry total supply tonnage and none of them carries a population to divide it by. The only ammunition row in the estate is in rounds per gun, with neither a shell weight nor a gun count, so it cannot be turned into weight and cannot enter a tonnage denominator. And one row writes a not-applicable as a zero, which will average and rank as though it were a measurement.

5 Results

5.1 Claim A: refused, on two independent grounds

VERDICT — CLAIM A IS REFUSED

The denominator does not exist. The briefed ratio requires total supply tonnage. The only denominator computable from anything on this machine is rations plus fodder, which is *subsistence* tonnage. The workbook's own cell is mislabelled: `summary!B25` reads `=ROUND(B17*B19/(B16*B18+B17*B19),3)`, whose denominator is `men × food plus horses × fodder`, and it is captioned "Share of the tonnage that is fodder". Ammunition, fuel, ordnance and equipment appear in no per-head row anywhere in the estate. Two genuine total-supply rows exist — the US and German divisional figures in Table 1 — and neither carries a men count or a horse count, so neither can be decomposed. Writing "supply tonnage" over a subsistence denominator would produce a number that is too high by an amount nobody can bound, since no row constrains the non-subsistence classes at all.

The force composition is a demonstration cell. The only composition on this machine is `summary!B16 = 15,000` men and `summary!B17 = 4,000` horses: hardcoded spreadsheet inputs with no army, no date, no source and no declared strength basis. A search across every workbook in the reference directory for horse, fodder, mule, wagon, forage and remount returns no other animal count — every other mention is a rate or a qualitative remark. The atlas database cannot supply one either: across its 163 tables there is no supply, logistics or animal table, and the 29 strength rows mentioning cavalry, horses, mules or wagons are all `parse_status = 'unparsed'`, all `scale = 'structural'`, all with `unit null` — the database itself declines to treat them as numbers. Cavalry troopers would in any case be a floor on horses of unknown looseness, since it omits draught, pack, remounts and the baggage train.

Neither ground can be closed by finding one citation. The second needs one good source; the first needs an entire tonnage column that does not exist. Both are itemised as unblocking conditions in §7.

5.2 Claim B: the decision rule's outcome

Both limbs of the decision rule fail. Claim B is refuted.

Limb (i) fails. The read-me asserts, in prose, that "a horse consumes roughly ten times a man, so in any pre-1940 army the majority of the supply tonnage feeds animals, not soldiers." Divide the sheet's own fodder band by its own food band and the achievable multiple runs from $9 \div 2.5 = 3.6$ at the least favourable corner to $14 \div 1.5 = 9.333$ at the most favourable. **Ten is not reachable at any corner of the workbook's own bands.** The assertion is not merely unsourced; it is contradicted by the rows printed four tabs away from it. This was parsed from the read-me cell by the instrument, not transcribed by hand.

Limb (ii) fails. On the workbook's own composition, the animal share of subsistence tonnage is **0.4898 to 0.7134**. That band straddles one half. At the low end fodder is a minority of even the subsistence tonnage; at the high end it is a clear majority. The workbook's own summary cell reports a single point, 0.595, and names no end of any band it came from — so the reader is handed a number that appears settled from a range that is not.

Table 2. Derived quantities. The arithmetic is exact; the inputs are T0 scaffold, and a derived figure can be no stronger than its weakest operand. The last row is the quantity the paper was asked for and is reported as refused rather than estimated.

QUANTITY	VALUE	BASIS — NUMERATOR OVER DENOMINATOR	CONFIDENCE
Subsistence tonnage	58.5–93.5 t/day	(men × rations) + (horses × fodder), on 15,000 ration-strength men and 4,000 undivided horses. Ration strength — every mouth drawing a ration, sick, attached and non-combatant included — is declared by the instrument and by nothing in the workbook.	Exact on T0 inputs
— single point	76.0 t/day	Midpoint of both input bands. Coincides with the midpoint of the output band, because the quantity is linear in its inputs.	Exact, linear
Animal share of <i>subsistence</i>	0.4898–0.7134	Horse-days of fodder, over horse-days of fodder plus man-days of rations. Horse count undivided between draught, cavalry and pack; man count carries no declared strength basis.	Exact on T0 inputs
— single point	0.6053	Ratio of the input midpoints. The midpoint of the output band is 0.6016; they differ by 0.0037 because a ratio of midpoints is not the midpoint of a ratio band. The gap travels with the figure.	Exact, non-linear — carries a warning
Fodder-to-food per head	3.6–9.333	kg per horse-day over kg per man-day, dimensionless. Like-for-like midpoint 5.75; the midpoint of the band itself is 6.4665, and the two differ for the same reason as above.	Exact on T0 inputs
Multiple asserted in prose ▶	10	Read-me assertion, no source, no derivation. OUTSIDE THE BAND ABOVE AT BOTH CORNERS.	T0, refuted by its own rows
Water	125–235 m ³ /day	Same composition. Held separate from dry tonnage and never added to it.	Exact on T0 inputs
Flip threshold, both corners	277.8 horses / 1,000 men	Exact rational arithmetic on the two rate bands only: share exceeds one half at every corner when $H/M > 2.5 \div 9 = 5/18$. Needs no force composition.	Structural — exact
Flip threshold, best corner	107.1 horses / 1,000 men	Same arithmetic at the most favourable corner: $H/M > 1.5 \div 14 = 3/28$.	Structural — exact
The workbook's composition ▶	266.7 horses / 1,000 men	Cells B17 ÷ B16. NO ARMY, NO DATE, NO SOURCE Sits 4% below the 277.8 threshold.	None — demonstration cell
Fodder share of <i>total supply</i> ▶	—	Refused. No total-supply denominator exists per man or per horse. Lower than the subsistence share by an amount no row on this machine can bound.	Not computable

5.3 Where the claim flips, and why that is the useful result

The threshold in Table 2 is the one figure in this paper that survives every objection raised against the rest of it, because it is a property of the two rate bands alone and needs no force composition whatsoever. Write the share as fodder tonnage over fodder plus ration tonnage. It exceeds one half at *both* ends of the band exactly when the horses-per-man ratio exceeds $2.5 \div 9$ — the worst case, where horses eat least and men eat most — which is $5/18$, or **278 horses per 1,000 men**. Below about **107 per 1,000** it fails even at the most generous corner. Between those two figures lies a region where the workbook's headline claim is neither true nor false but undetermined by the workbook's own numbers.

Figure 1. The animal share of subsistence tonnage, as a function of horses per 1,000 men, bounded by the two corners of the workbook's own rate bands. The shaded region is everything the sheet's numbers permit; the dotted horizontal line is one half. The region first touches one half at 107 horses per 1,000 and lies wholly above it from 278 onward; between the two markers the majority claim is undetermined by the source's own rows. The heavy vertical rule is the workbook's own composition at 267 per 1,000 — inside the undetermined band, four per cent short of the threshold at which its headline claim would hold at both corners. *No trend line is fitted and none may be: this is a class 1 corpus diagnostic over 18 rows, and a fitted line would assert a relationship estimated from observations that do not exist here.* The two boundaries are not fits. They are the exact algebraic locus of $\text{fodder} \div (\text{fodder} + \text{rations})$ evaluated at the band corners — deterministic arithmetic on two published bands, with nothing estimated and no residual. Figures pending source verification.

5.4 The row that fits worst

It is the force composition, and it belongs here in the body rather than in a note, because it is the row that most damages the paper's own source. **The workbook asserts the majority claim, and then supplies a composition that does not satisfy it.** Its own 267 horses per 1,000 men sits four per cent below the 278 at which the claim would hold at both corners. Push the horse count from 4,000 to 5,000 and the band becomes 0.5455 to 0.7568, entirely above one half, and the claim is settled. At 4,000 it is not. The workbook's headline claim therefore flips inside a region that nobody sourced — neither the composition nor the rate bands has a citation — and it lands, by whatever accident produced a round 4,000, on the wrong side.

Two further rows fit badly enough to name. `division-napoleonic` carries 0–0 tons per day, which is a not-applicable written as a number: the corps lived off the country and had no supply column to measure, and a zero standing in for that will sum, average and rank as a real measurement in any downstream use. And `summary!B19`, the fodder constant, is 11.0 while declaring itself the midpoint of its own 9–14 row, which is 11.5. That is a constant asserting a derivation it does not satisfy, and it is precisely the operand the headline share rests on. Both were caught by the instrument's audit pass rather than by reading.

5.5 What this does not overturn

The qualitative proposition — that animals consumed a large share of a pre-mechanised army's daily tonnage — is not touched by any of this. Nothing here shows it to be false. What is shown is narrower and, for the estate's purposes, more useful: the specific quantitative form of it that circulates in this workbook is not supported by this workbook, and the arithmetic needed to settle the question has never been done here, on any army, with any source. Three separate cells across two workbooks restate the same assertion — the read-me, the `resources` sheet's "a horse eats roughly ten times a man; fodder dominates tonnage", and the material-layer workbook's "an army's horses eat more tonnage than its men". Those are three coats on one recollection, not three attestations. Counting them as corroboration would be the same error as reading the two byte-identical workbook files as two sources.

6 Threats to validity

1. **Selection.** The corpus is one sheet in one workbook, chosen because it is the only place on this machine holding per-head consumption rates. That makes the enumeration complete but the corpus itself entirely unrepresentative of military logistics literature. Nothing here generalises past the 18 rows, and the class 1 label exists to make that impossible to forget.
2. **The source is scaffold, and so is everything derived from it.** All 18 rows are T0 by the workbook's own admission. Exact arithmetic on unsourced inputs produces an exactly computed unsourced output. The precision of 0.4898 is arithmetic precision, not evidential precision, and the two are routinely confused by readers of tables like Table 2.

3. **The instrument and the paper share an author.** The audit findings in §5.4 come from `ops/command_supply.py`, whose gate passes 16 checks with zero violations and whose drill is 27 of 27 with 9 positive controls and 18 red-team cases that each prove a specific guard can fail. That is a real defence and it is not sufficient. Its guards test the shapes actually present in this workbook; a defect of a shape nobody imagined passes all of them silently, and every catalogued failure is one that was *caught*, so the catalogue understates by an unknown amount. The source checks test structure, never truth: a plausible fabrication passes every one of them.
4. **The rows were read before the decision rule was written.** The absence of a denominator was established by reading the sheet, and the decision rule for Claim B was written afterwards. A rule written after the data is a rule shaped by the data. It is stated here rather than presented as a preregistration it is not, and the strongest defence available — that both limbs failed, so the rule was not shaped toward a pass — is a weak defence and is offered as one.
5. **The horse count is a weighted mean with unknown weights.** Draught, cavalry and pack animals do not eat alike, and 9–14 kg is a single band over all three. Any share computed from an undivided horse count inherits a weighting nobody declared.
6. **The man count has no strength basis.** "Men" admits effectives, present-for-duty, aggregate-present and engaged, which can run up to thirty per cent apart for one army on one day. The instrument declares ration strength for its own derivation; the workbook declares nothing, and the choice moves the denominator directly.
7. **The absence is not itself recorded.** The atlas holds nine `attested_absent` rows, and rows six and seven record exactly analogous quantity-absences — Arrian giving no army total for Alexander at the Hydaspes, Chavannes giving no army size at Changping. No row records the absence of a logistics or animal-count layer. Until one exists, the next reader of the atlas has nothing to tell them this gap was ever looked for, which is how an absence gets rediscovered instead of remembered.

7 What would refute this, and what would unblock it

Stated so that a reader without access to this machine can check each one.

7.1 What would refute the findings

- A `logistics_rates` sheet whose `COUNTA` returns a number other than 18, or a count returning a different number of rows from the same file, would break the completeness on which the class 1 design rests.
- A fodder or food band in that sheet whose corners admit a multiple of ten would reinstate limb (i) of the decision rule.
- A demonstration that $\text{fodder} \div (\text{fodder} + \text{rations})$ exceeds one half at both corners for a composition below 278 horses per 1,000 men would break the threshold arithmetic. The threshold is exact rational arithmetic, so this would mean an error in the algebra, not a difference of judgement, and it is the easiest claim in the paper to check independently.
- A per-head tonnage row for ammunition, fuel, ordnance or equipment found anywhere in the estate would defeat §5.1's first ground and put Claim A back in play.

7.2 What would unblock Claim A, in order of difficulty

1. **A total-supply decomposition.** Ammunition, fuel, ordnance and equipment tonnage per man or per formation-day. This is the fatal gap and no single citation closes it; it needs a whole tonnage column that does not exist here. Without it the denominator can only be subsistence, and the fodder share of *total* supply is lower than the computed figure by an amount that cannot even be bounded.
2. **A named, sourced force composition.** An army, a date, and its horses per 1,000 men with a published basis. This is the one item a single good source could supply.
3. **A strength basis for the man count**, declared: effectives, present-for-duty, aggregate-present or engaged.
4. **A horse breakdown** into draught, cavalry and pack, with a fodder band for each rather than one band over all three.
5. **Named sources for every rate band**, which the workbook's own read-me states are required before publication.

7.3 Retirement state and reinstatement condition

Claim A is retired to `refused_for_want_of_denominator`. It is reinstated only when item 1 *and* item 2 above are both satisfied — not one of them, because either alone leaves a computable-looking number with an uncomputable error. Claim B is retired to `refuted_by_its_own_source`, and would be reinstated by a corrected sheet in which the asserted multiple falls inside the published bands and the supplied composition exceeds 278 horses per 1,000 men.

Neither claim is to be softened into a hedged version of itself. A retitled quantity is acceptable and is what §5.2 publishes: *fodder share of subsistence tonnage*, which is a real quantity honestly named. A share over a subsistence denominator described as a share of supply is not a rougher answer to the same question. It is an answer to a different one.

8 Data availability and status

The 18 admitted rows live in the sheet `logistics_rates` of `command-and-tactics.xlsx`, present at two byte-identical paths on this machine and counted as one source. The force composition and the audited calculator cells are in the `summary` sheet of the same file, at B16 to B27. The absence findings are from `war-atlas/db/atlas.db`: 163 tables holding no supply, logistics or animal table, and 29 strength rows mentioning cavalry, horses, mules or wagons, every one of them `parse_status = 'unparsed'`, `scale = 'structural'` and `unit null`.

RECOMPUTE — EVERY FIGURE IN THIS PAPER

```
python ops/command_supply.py # bands, shares, gate: 16 checks, 0 violations, 3 declared warnings python ops/command_supply.py --drill # 27/27, 9 positive controls, 18 red-team cases # thresholds, exact rational arithmetic on the two rate bands alone python -c "from fractions import Fraction as F; print(F(5,2)/9, F(3,2)/14)" # 5/18 = 0.2778 -> 278 per 1,000 | 3/28 = 0.1071 -> 107 per 1,000
```

Status: refusal published, figures pending source verification. Every band in Table 1 and every input to Table 2 is T0 scaffold on the workbook's own statement about itself, and none of it should be cited as a fact about any army. What can be cited is the structure: that the sheet contains 18 rows, that its asserted multiple of ten lies outside its own bands, that its majority claim is undetermined at its own composition, and that the threshold at which the claim becomes determinate is 278 horses per 1,000 men. Those four statements survive the sourcing problem entirely, because each is a property of the arithmetic rather than of the world.

One outstanding item is owed to the atlas and is recorded here so it is not lost: no `attested_absent` row exists for the missing logistics and animal-count layer, though the mechanism for recording exactly that kind of absence is already in use for army totals at the Hydaspes and Changping. The absence has been noted to the ledger; it has not yet been written to the atlas, and until it is, this paper is the only thing on the machine that knows the gap was looked for.

War Atlas method series, paper 03 · dylanvir.com/war · Registered 2026-09-09 · **Class 1** — a corpus diagnostic over 18 enumerated rows. This paper makes no claim about any army, any period, or any population of forces. Claim A is refused; Claim B is refuted by its own source. Figures pending source verification.