DT-11 The rule of ten: nested decimal organisation across cultures

The recurring emergence of nested decimal organisation—structures grouping individuals or households into cascading administrative units of ten, one hundred, one thousand, and ten thousand—represents one of the most pervasive, enduring, and ultimately coercive administrative technologies in human history. Found in the pastoral confederations of the ancient Near East, the Andean highlands of the Inca, the Eurasian steppes of the Mongol Empire, the bureaucratic apparatus of Imperial China, the localized jurisdictions of medieval England, the militarized frontiers of the Roman Empire, and the totalitarian quotas of the Soviet Union, the "rule of ten" poses a fundamental anthropological and historical question: does this architecture represent cultural diffusion, a convergent design, or an intrinsic property of human group size?

The historical and empirical record indicates overwhelmingly that nested decimal organisation is a technology of convergent design, driven by the biological artifact of ten fingers, which facilitated intuitive mathematical auditing by early states seeking legibility over their populations. However, this administrative grid operates in direct and constant tension with the biological and cognitive limits of human social networks. As demonstrated by evolutionary anthropology, human social relationships scale geometrically at a ratio of approximately three, not ten[1]. Consequently, nested decimal grids are rarely self-governing; they are almost exclusively artificial, coercive architectures imposed from above. As scholars of state formation such as Charles Tilly and Patricia Crone have observed, the pre-industrial state engaged in a perpetual struggle to penetrate and dissolve opaque, organic kin networks (segmentary lineages), replacing them with a legible cadastre designed to optimize taxation, streamline military conscription, and enforce collective surveillance[2].

The Pastoral Prototype: Jethro's Counsel to Moses

The biblical narrative of Exodus 18 presents one of the earliest textual formulations of nested decimal governance, situated in the geopolitical context of the Sinai wilderness during the Late Bronze Age or early Iron Age. Following the exodus from Egypt, Moses functioned as the sole adjudicator for an Israelite population conservatively estimated by the text at two million (Exodus 12:37; Numbers 1:46)[5]. This centralized, personality-driven governance resulted in queues thousands deep, causing severe decision fatigue and an administrative bottleneck that threatened the cohesion of the fleeing populace[5]. Moses's father-in-law, Jethro (also known as Reuel), the priest of Midian, observed this unsustainable model and advised a system of subsidiarity[7]. He instructed Moses to select capable men to serve as "rulers of thousands, hundreds, fifties and tens" (Exodus 18:21), creating a decentralized judicial grid to handle interpersonal conflicts, escalating only the most complex matters to Moses himself[7].

The arrangement's own people, as preserved in the scriptural text, framed this decimal hierarchy as a divinely sanctioned method of administrative relief and communitarian ethical responsibility[9]. The Israelites viewed the system as a mechanism to ensure swift, equitable

justice while simultaneously educating the populace in divine statutes prior to the receipt of the Decalogue at Sinai[5]. It was understood as a protective measure to shield commoners from delayed justice while preventing the physical exhaustion of their prophet.

The historical record, reflecting broader Ancient Near Eastern judicial customs, shows that this text describes a highly functional, decentralized appellate grid. Contemporary cultures, such as 18th-century BCE Mesopotamia under the Code of Hammurabi, employed similar tiers of local magistrates accountable to a centralized king[5]. The Israelite iteration mapped onto the harsh logistics of wilderness survival, where the basic unit of 'ten' aligned effectively with the extended patriarchal household, transforming heads of families into low-level magistrates.

Modern scholarship infers a more complex origin for this text. Critical scholars, such as John Van Seters, point out the methodological contradiction in assuming the Exodus 18 narrative perfectly reflects historical events of the 13th century BCE[11]. The parallel account in Deuteronomy 1 relies heavily upon the later Deuteronomic Code, presenting a homogeneous statement about institutional origins intended to regulate life in the promised land[11]. Modern biblical criticism suggests that scribes likely synthesized administrative realities of the later Israelite monarchy—such as the 9th-century BCE reforms of King Jehoshaphat—with the figure of Jethro to provide a compelling historical etiology for the nation's system of law courts[11]. Furthermore, the inclusion of a Midianite (Gentile) priest instructing the Israelite leader served a theological purpose, countering notions of ethnic exclusivity and establishing a proto-structure for shared stewardship[5].

Scale Ledger: Jethro's Decimal System	**Status & Rationale**
Household (4 to 10 people)	**Worked.** The base unit of 'tens' mapped perfectly to the extended patriarchal household, facilitating rapid dispute resolution among intimately acquainted kin[7].
Hamlet or band (30 to 50)	**Worked.** The 'fifties' rung managed inter-household disputes, maintaining the localized peace necessary for nomadic pastoral survival[10].
Village (150 to 500)	**Worked.** The 'hundreds' rung handled complex resource distributions, likely aligning with minor clan divisions.
Parish or district (1,500 to 5,000)	**Worked.** The 'thousands' rung served as the highest appellate level before Moses, functioning effectively as major tribal sub-divisions capable of fielding military

	units[12].
Town or watershed (15,000 to 50,000)	**Not tried.** The system lacked an administrative unit for tens of thousands, jumping directly from the rulers of thousands to Moses[8].
Region to Planet (0.5 million to 8 billion)	**Not tried.** The arrangement was inherently limited to the scale of a tribal confederation in a localized geographic theater.

To run a capture test on Jethro's model requires assessing how an individual with dark-triad traits (narcissism, Machiavellianism, psychopathy) could exploit it. A Machiavellian actor could capture this system by securing an appointment as a ruler of fifties or hundreds, leveraging the position to extract bribes or render biased judgments favoring their immediate kin. However, the system possessed robust internal resistance features. First, the appellate structure meant that corrupt lower-level magistrates could be bypassed by appealing to the next rung. Second, Jethro explicitly mandated strict selection criteria, requiring men "who fear God, trustworthy men who hate dishonest gain" (Exodus 18:21), actively screening against psychopathic opportunism[5].

The Steppe War Machine: The Mongol Decimal System

In 1206 CE, after unifying the nomadic tribes of the Eurasian steppe, Genghis Khan (Temujin) enacted a radical restructuring of Mongol society, transforming it into a strict decimal military hierarchy. The traditional tribal allegiances that had fueled centuries of internecine warfare were systematically dissolved. In their place, Genghis Khan imposed the *arban* (10 men), *zuun* (100), *mingghan* (1,000), and *tumen* (10,000)[13].

The arrangement's own people, as codified in the *Yassa* (the oral legal code) and chronicled in texts like *The Secret History of the Mongols*, claimed this system was a manifestation of divine right[13]. The Mongols articulated that the decimal organization brought universal order to the chaotic steppes, enforcing perfect military discipline and providing economic stability for a pastoral people whose previous existence offered little more than basic food and clothing[13]. Under this ideology, the decimal grid was not an imposition, but a sacred unification of the felt-tented peoples.

The historical record shows that this structure produced the most lethal, mobile, and coordinated cavalry force in pre-industrial history, enabling the conquest of the largest contiguous land empire[14]. Led by brilliant tacticians like Subutai and Jebe, the Mongol army utilized the decimal grid to execute complex battlefield maneuvers across vast distances without modern communications. The *arban* lived, ate, and fought together, functioning as a synthetic family unit, while the *tumen* operated as a fully independent, self-sustaining army division capable of conquering entire nations[13].

Modern scholarship, notably the work of Igor de Rachewiltz and David Morgan, infers that the

Mongol decimal system was a totalitarian mechanism of social engineering and psychological control[13]. Genghis Khan deliberately mixed men from rival tribes and lineages into single *arbans* to shatter organic aristocratic kin groups and redirect ultimate loyalty exclusively to the Khan. It was a surveillance and conscription grid defined by absolute collective liability. If one man in an *arban* fled in battle, the remaining nine were executed; if an entire *arban* retreated, the *zuun* was slaughtered[14].

Scale Ledger: Mongol Decimal System	**Status & Rationale**
Household (4 to 10 people)	**Worked.** The *arban* (10) functioned as a highly cohesive synthetic household forged through shared trauma, survival interdependence, and collective liability[13].
Hamlet or band (30 to 50)	**Not tried.** The Mongol system notably skipped the intermediate rung, jumping directly from the 10-man squad to the 100-man company.
Village (150 to 500)	**Worked.** The *zuun* (100) acted as a cohesive tactical cavalry squadron, capable of executing flanking maneuvers.
Parish or district (1,500 to 5,000)	**Worked.** The *mingghan* (1,000) was the primary operational unit of the empire, striking a balance between mass and mobility[13].
Town or watershed (15,000 to 50,000)	**Worked.** The *tumen* (10,000) formed a strategic division, massive enough to conduct independent siege operations against fortified cities[13].
Region or bioregion (0.5 to 5 million)	**Worked (Temporarily).** At the imperial scale, the system held together only under the gravity of exceptionally strong, centralized leadership.
Nation to Planet (50 million+)	**Failed.** Following the deaths of the founding generations, the empire fractured into rival Khanates (e.g., the Golden Horde, the

	Ilkhanate), because the decimal grid lacked organic cultural roots beyond military conquest[13].

The capture test reveals that the Mongol decimal system was, in its essence, the successful capture of an entire civilization by a ruler exhibiting profound Machiavellian and psychopathic traits. Genghis Khan utilized the mathematically legible grid to systematically purge rival chieftains and enforce absolute obedience through the terror of collective punishment. The unit commanders (*noyans*) were appointed strictly from above based on ruthless loyalty, offering no democratic recourse. The system lacked internal resistance features against the Khan himself; it only functioned to project his will outward, often culminating in genocidal campaigns and early biological warfare (such as catapulting plague-ridden corpses over city walls)[14].

The Andean Cadastre: Inca Decimal Administration

In the central Andes, the Inca Empire (Tawantinsuyu) managed its vast, linguistically diverse population without the use of a written alphabet, relying instead on a highly formalized decimal administration. The structure built upward from the *chunka* (10 taxpayers), to the *pichkachunka* (50), *pachaka* (100), *pichkapachaka* (500), *waranqa* (1,000), *pichkawaranqa* (5,000), and *hunu* (10,000)[16]. This state-imposed grid was overlaid upon the pre-existing Andean *ayllu*—the fundamental social and territorial kin group—and managed by local lords known as *curacas*[18]. Information was recorded by state accountants (*quipucamayocs*) using *quipus*, three-dimensional devices fashioned from knotted cords that utilized a strict base-10 positional system[20].

The Inca themselves communicated that this decimal system was a reflection of a harmonious cosmic order. They claimed it ensured the equitable distribution of resources, the maintenance of the state religious cults (including the recording of *huacas* and sacrifices), and the precise fulfillment of the *mit'a*—the mandatory labor tax required of all citizens to build roads, terraces, and military storehouses[18]. The decimal structure was purportedly the ultimate expression of imperial reciprocity, where labor provided to the Sapa Inca was repaid with state-sponsored feasts and security[18].

The historical record confirms the staggering logistical efficacy of this administration. Utilizing *quipus*, administrators recorded data with immense precision. A digit in the "ones" position was represented by a figure-eight knot or long knots with multiple turns, while tens, hundreds, and thousands were denoted by simple overhand knots placed higher up the pendant cord[20]. This allowed the state to mobilize massive, precisely calculated labor forces, stock regional storehouses (like the garrison at Inkawasi), and sustain an empire spanning the length of the Andes[26].

However, modern scholarship—spearheaded by anthropologists and ethnohistorians like Catherine Julien, Terence D'Altroy, and Gary Urton—infers a severe discrepancy between the pristine decimal ideology and ethnographic reality[18]. The decimal system was, in many regions, a bureaucratic fiction imposed for state legibility. While relatively functional near the capital of Cuzco, it met fierce resistance in the provinces, particularly in Collasuyu (modern-day Bolivia).

There, Aymara-speaking populations persistently evaded decimal reorganization, fighting to preserve their organic *ayllu* boundaries and their "vertical archipelago" networks of ecological exchange[18]. The state's attempt to artificially amalgamate separate kin groups to round out a 100-taxpayer *pachaka* bred deep local resentment.

Scale Ledger: Inca Decimal System	Status & Rationale
Household (4 to 10 people)	**Worked.** The *chunka* (10) mapped roughly to an extended family compound, simplifying the counting of heads for the *mit'a* draft[16].
Hamlet or band (30 to 50)	**Worked.** The *pichkachunka* (50) provided a highly manageable, localized labor gang for agricultural terracing and road maintenance[17].
Village (150 to 500)	**Failed/Resisted.** The *pachaka* (100) frequently conflicted with the natural, organic boundaries of the *ayllu*. Merging distinct kin groups into arbitrary decimal units sparked persistent structural friction[18].
Parish or district (1,500 to 5,000)	**Worked.** The *waranqa* (1,000) functioned adequately as a regional administrative quota, managed by upper-tier *curacas* who interfaced directly with Inca nobility[17].
Town or watershed (15,000 to 50,000)	**Worked.** The *hunu* (10,000) was the highest purely decimal unit, overseen by a *hunu kuraka* who reported to the governor of a quarter of the empire[16].
Region to Planet (0.5 million+)	**Not tried.** Above the *hunu*, the empire transitioned into four vast geographic quarters (*suyus*), abandoning the decimal multiplier[16].

Subjecting the Inca administration to a capture test demonstrates vulnerabilities at the middle-management tier. A Machiavellian *curaca* could capture the local rung by manipulating the *quipu* census data, hiding population numbers to shield their own kin from the brutal *mit'a* labor draft, or hoarding state goods meant for redistribution[18]. The Inca state resisted this localized capture through an aggressive auditing regime by superior *quipucamayocs* and

draconian punishments for data falsification. However, this top-down coercion alienated the provincial elites. When the Spanish conquistadors arrived, the system collapsed rapidly because local lords felt no organic loyalty to the artificial decimal grid, readily abandoning it to reclaim local autonomy[30].

Legalist Legibility: The Chinese Baojia System

In 4th-century BCE China, the Legalist philosopher Shang Yang enacted sweeping reforms in the state of Qin, famously detailed in the *Book of Lord Shang*. He instituted one of history's first household registration systems (*hukou*), grouping families into units of five (*wu*) and ten (*shi*)[31]. Over a millennium later, in 1070 CE, the Song Dynasty Chancellor Wang Anshi revived and expanded this Legalist concept into the *baojia* system as part of his controversial "New Policies" (xinfa). Under Wang's iteration, ten households formed a *jia*, and ten *jia* formed a *bao*[34]. This governance technology also diffused across the sea, appearing later in Japan as the Tokugawa *goningumi* (five-household groups).

The architects of these systems explicitly stated their objectives. Shang Yang argued that organizing the populace into mutual-surveillance squads ensured absolute state security, eliminated "parasitic" occupations, and focused the populace entirely on agriculture and war. "When the people are weak, the state is strong," Shang famously dictated, advocating that neighbors must monitor and regulate each other[31]. Wang Anshi claimed his *baojia* system would provide robust local defense militias, reduce the central government's military expenditure, and maintain social order by transferring police powers to the local population[35].

The historical record indicates that while these systems briefly increased state revenue and military manpower, they fundamentally devolved into mechanisms of collective punishment, forced loans, and intense social paranoia. Under the Song dynasty, the *baojia* became entwined with Wang Anshi's Market Exchange Law and Hired Labor Law, resulting in local officials abusing the system to force loans with exorbitant interest rates onto the peasantry[35]. Those who failed to report a crime within their unit were treated as accomplices, breeding a culture of pervasive distrust[31].

Modern scholarship, epitomized by Hsiao Kung-chuan's monumental *Rural China: Imperial Control in the Nineteenth Century*, demonstrates that the *baojia* system was never self-governing; it was fundamentally a tool of imperial extortion designed to crush the autonomy of organic lineage networks[34]. Sima Guang, Wang Anshi's primary conservative opponent, emerged as a leading critic, arguing correctly that the mandatory *baojia* detracted from agricultural productivity, treated the economy as a zero-sum game, and empowered corrupt local clerks to terrorize the peasantry[37]. The system was eventually abolished, only to be resurrected repeatedly by later dynasties seeking demographic control[35].

Scale Ledger: Baojia System	**Status & Rationale**
Household (4 to 10 people)	**Failed.** The 10-household *jia* generated severe internal distrust. Because neighbors

	were legally required to inform on one another to avoid collective punishment, the system eroded natural community bonds[31].
Hamlet or band (30 to 50)	**Not tried.** The system moved rigidly from 10 directly to 100 households, ignoring natural neighborhood dynamics.
Village (150 to 500)	**Failed.** The 100-household *bao* was consistently captured by predatory clerks and local bullies who used the threat of collective liability to extort entire communities[42].
Parish to Planet (1,500+)	**Failed.** At higher levels, the system routinely collapsed under its own bureaucratic weight, massive logistical overhead, and the fierce resistance of deeply entrenched traditional kin lineages[34].

The *baojia* system presents a textbook case study in psychopathic capture. Individuals with dark-triad traits naturally gravitated toward the role of *jia* or *bao* headmen, or local government clerks. A Machiavellian clerk could threaten to falsely report a household for a crime, knowing that the structural design of collective punishment meant the entire *jia* would be liable[42]. Thus, the community could be easily blackmailed. The only resistance feature available against this systemic capture was elite political opposition at the imperial court; the system was only curbed when conservative factions recognized that the grid was destroying the state's agricultural base and inciting banditry[41].

Mutual Suretyship: The Anglo-Saxon Tithing and Norman Frankpledge

Developing from earlier Anglo-Saxon *borh* (suretyship) practices, the frankpledge system matured fully under Norman rule following 1066. It mandated that all non-exempt men over the age of twelve—excluding clergy and high nobles—be organized into a *tithing* (a group of ten men, led by a chief pledge or tithingman), which were in turn nested into *hundreds*[44].

The arrangement's own people claimed the system was a communal mechanism to uphold the king's peace. It relied on the principle of mutual suretyship, dictating that if a crime occurred, the tithing was collectively responsible for apprehending the culprit and producing him in court[44]. It was presented as a localized, self-policing neighborhood watch that distributed the burden of law enforcement among the peasantry in an era devoid of professional police forces.

The historical record, notably preserved in medieval court rolls, shows that the system was quickly transformed into a massive revenue-generating mechanism for the crown. The bi-annual

"view of frankpledge"—the inspection of the tithings by the local sheriff at the hundred court—became an opportunity to levy widespread amerciaments (fines) for minor infractions, unraised hues and cries, or the failure to capture fugitives[44].
Modern scholarship, advanced by F.W. Maitland and William Alfred Morris in his seminal 1910 work *The Frankpledge System*, details how the Norman conquerors weaponized this decimal grid[47]. By enforcing the *murdrum* fine—a crippling financial penalty levied against an entire hundred if a dead body was discovered and could not be proven to be English, thus presumed to be a murdered Norman—the system shifted entirely from community self-policing to collective financial extortion[44]. It became a tool of subjugation, ensuring the conquered populace bore the financial burden of the conquerors' security.

Scale Ledger: Frankpledge System	**Status & Rationale**
Household (4 to 10 people)	**Worked (briefly).** The 10-man tithing functioned adequately as a cohesive watch unit, provided the men were genuine peers living in close proximity[44].
Hamlet or band (30 to 50)	**Not tried.** The system nested directly from the tithing into the hundred.
Village (150 to 500)	**Failed.** The 'hundred' devolved from a community assembly into an abstract territorial unit used primarily for collective financial punishment (*murdrum*) by the absentee state[44].
Parish to Planet (1,500+)	**Not applicable.** The system was strictly a local judicial mechanism and was superseded by professional justices at larger scales[51].

The frankpledge system was easily captured by Machiavellian sheriffs. Through the "tourn" (the sheriff's circuit court), corrupt officials used the collective liability clause to invent minor infractions, levying heavy fines on entire tithings to enrich themselves and the crown[44]. Furthermore, a psychopathic or vindictive tithing member could commit a crime and intentionally flee, fully aware that the financial ruin would fall upon his nine peers[45]. The system possessed no internal resistance to state extortion and gradually decayed over the 14th century as professional justices of the peace and individual legal liability evolved, proving that a collective decimal model was unworkable for long-term civil justice[51].

The Military Machine: The Roman Century

The core infantry unit of the Roman legion was the *centuria*. Originally denoting 100 men, the century was stabilized following the Marian reforms at 80 men. These 80 men were divided into ten *contubernia* of 8 men each. Six centuries were then nested into a cohort (480 men), and ten cohorts formed a legion (~5,000 men)[53].

The Roman commanders and tacticians asserted that this structure provided unparalleled battlefield flexibility and discipline. The century was large enough to sustain casualties but small enough to respond instantly to the visual signals of the *signifer* (standard-bearer) and the shouts of the centurion, allowing the legion to operate as a living, adaptable machine rather than a rigid phalanx[53].

The historical record reveals that the true strength of the system lay at the base rung. The *contubernium* (8 men) shared a tent, a mule, foraging duties, and meals[56]. This enforced intimacy forged the deepest bonds of loyalty and mutual protection, mapping perfectly onto the evolutionary constraints of the human primary support clique. Above them, the centurion served as the violent, experienced enforcer of discipline, recognizable by his transverse crest and vine-staff, carrying out administrative duties, assignments, and brutal physical punishments[53].

Modern scholarship, such as the analysis of military documents by Lawrence Keppie, highlights that the century was fundamentally an intense administrative and accounting unit. Bureaucracy was pervasive; pay, deductions, savings, and casualty lists were meticulously tracked per individual within the century, with records forwarded to the *aerarium Saturni* in Rome[57]. The decimal grid allowed the Roman state to project complex logistical power across continents.

Scale Ledger: Roman Century	**Status & Rationale**
Household (4 to 10 people)	**Worked.** The 8-man *contubernium* remains one of history's most successful applications of the primary group, aligning flawlessly with natural human bonding limits[56].
Hamlet or band (30 to 50)	**Not tried.**
Village (150 to 500)	**Worked.** The 80-man century and 480-man cohort were optimal sizes for battlefield command, vocal control, and administrative tracking[54].
Parish or district (1,500 to 5,000)	**Worked.** The legion (~5,000 men) functioned effectively as a self-contained, mobile town, complete with its own engineers, artillery, and logistical train[54].
Town to Planet (15,000+)	**Worked.** Multiple legions could be

	combined into massive field armies, though heavily dependent on the competence of the commanding general.

Because centurions possessed near-absolute power over the daily lives and physical well-being of their men, the role was highly attractive to dark-triad personalities. Extortion was institutionalized; centurions routinely accepted bribes from legionaries in exchange for favorable duties, exemptions from hard labor, or promotion recommendations[53]. However, the system maintained a brutal, organic resistance feature against total psychopathic capture: centurions were required to take a position in the first rank, on the right side of the century, leading head-first into the fray[53]. This resulted in a massively high mortality rate among officers, naturally culling the most abusive, cowardly, or incompetent commanders whose men might otherwise fail to protect them in the chaos of melee combat[59].

From Peasant Commune to Totalitarian Quota: The Russian Mir to Soviet Tens

In Tsarist Russia, the fundamental unit of rural social organization was the *obshchina* or *mir* (village commune). It operated on the deeply ingrained cultural principle of *krugovaya poruka* (mutual responsibility), holding the entire village collectively liable for state taxes, feudal obligations, and military conscription drafts[60]. Following the Bolshevik revolution, this centuries-old culture of collective liability was seamlessly weaponized by the totalitarian state. The arrangement's own people and ideological defenders offered contrasting justifications over time. 19th-century Slavophiles and early socialists romanticized the *mir* as an organic, egalitarian institution that protected peasants from the ravages of Western capitalism, pointing to its practice of periodic land redistribution (strip farming)[61]. Decades later, the Soviet apparatus claimed that implementing strict administrative quotas and collective surveillance via "tens" was a necessary measure to eliminate anti-Soviet elements and protect the proletariat[64].

The historical record demonstrates that the Tsarist state fiercely protected and preserved the *mir* precisely because it outsourced the arduous task of tax collection and prevented peasant mobility. It bound the peasant to the land, utilizing the village elders (*starosta*) as unpaid state enforcers[60]. Despite the Stolypin agrarian reforms (1906–1914) aimed at creating private land ownership, the communal structure largely persisted[61].

Modern scholarship, advanced by historians like Richard Pipes and Oleg Khlevniuk, demonstrates that the *mir*'s culture of communal liability laid the fatal psychological groundwork for Stalin's Great Terror. Under NKVD Order No. 00447, signed by Nikolai Yezhov on July 30, 1937, the Soviet state imposed strict, decimal-based numerical quotas for executions and imprisonments across all regions[64]. Managed by *troikas* (three-man extrajudicial committees), the state dictated exact limits. For example, the Byelorussian SSR was given an estimated quota of 2,000 "Category I" (execution) and 10,000 "Category II" (imprisonment) individuals[66].

Scale Ledger: Russian Collectives	Status & Rationale
Household (4 to 10 people)	**Failed.** The *mir* dealt with the household rather than the individual, trapping productive members under the debts and failures of the unproductive[61].
Hamlet or band (30 to 50)	**Worked (barely).** It allowed for basic agricultural survival in a harsh, unforgiving climate through forced cooperation[63].
Village (150 to 500)	**Failed.** The *mir* assembly became a mechanism for the state to extract resources via collective guilt, pitting neighbors against each other[62].
Parish to Planet (1,500+)	**Failed.** The elevation of the quota system to a national scale resulted in industrial slaughter. By November 1938, the NKVD had executed over 386,798 citizens, with regional heads continually requesting increases to their execution quotas to prove their loyalty[64].

The Stalinist quota system represents the ultimate historical example of psychopathic capture of an administrative grid. Nikolai Yezhov and the regional *troikas* utilized the numerical quotas to execute innocents simply to fulfill state limits, viewing human lives strictly as decimal targets to be met or exceeded[64]. There were no resistance features remaining in the society; the centuries of *krugovaya poruka* in the *mir* had already conditioned the population to accept that the state could arbitrarily punish the group for the alleged sins, or mere existence, of the individual.

Synthesis: Dunbar's Layers vs. The Decimal Grid

The recurring failure of the nested decimal system outside of strict, lethal military contexts can be comprehensively explained by contrasting it with the cognitive constraints of human neurobiology. Evolutionary psychologist Robin Dunbar, examining the neocortex ratio of 38 non-human primate species and comparing it to 9 hunter-gatherer groups, demonstrated that primate intelligence evolved primarily to manage complex social relationships, not environmental challenges[67]. Based on the size of the human neocortex, the maximum cognitive limit for maintaining stable, reciprocal human relationships is approximately 150 (the Dunbar Number)[67].

Crucially, empirical studies show that human social networks do not scale in factors of ten. They scale in a discrete, fractal hierarchy with a preferred scaling ratio of approximately three (ranging from 3.1 to 3.5)[1]. This produces natural cognitive layers: 5 (the support clique), 15 (the

sympathy group), 50 (the band or camp), 150 (the clan), 500 (the megaband), and 1,500 (the tribe)[1].

A decimal system forces a geometric scaling ratio of ten (10, 100, 1,000), which imposes an immense cognitive load. In a natural group of 5 people, there are 10 bilateral relationships to track. In a decimal group of 10, there are 45. While manageable, the jump to the next decimal rung—100 people—creates 4,950 potential bilateral relationships. This vastly exceeds the human capacity for natural empathy, trust, and mental tracking, which Dunbar identifies as maxing out at the 15- and 50-person levels for deep cooperation[69]. By forcing a jump from 10 directly to 100, the decimal grid obliterates the two most vital organic layers of human solidarity: the 15-person sympathy group and the 50-person band.

Therefore, the decimal grid is not an organic property of human group size; it is a technology of *state legibility*. Ten is utilized globally because humans count on ten fingers, making it mathematically intuitive for state auditors, tax collectors, and military logisticians. As Patricia Crone argues regarding pre-industrial societies, the state constantly seeks to penetrate and dissolve organic tribal and kinship structures because segmentary lineages are opaque and highly resistant to central taxation[2]. The decimal grid is the ultimate weapon of this penetration. By imposing it, the state renders the population mathematically legible while simultaneously atomizing them, breaking the natural scaling ratio of three that fosters organic resistance.

The Strongest Case Against and the Naturalistic Fallacy

The strongest case against this analysis is the argument that decimal systems were genuinely successful adaptations to demographic crises and external threats, providing public goods where organic structures failed. Historians of the Tang and Song dynasties, examining Wang Anshi's *baojia*, occasionally argue that such systems were necessary civil-defense adaptations in an era of rapid population explosion and severe threat from northern nomadic empires (Liao and Western Xia)[35]. They contend that the grid created welfare, localized defense, and infrastructural maintenance that localized tribes could never coordinate.

However, one must rigorously avoid the naturalistic fallacy and the romance of the primitive. To critique the artificial decimal grid as coercive is not to romanticize the "organic" kin structures—the Andean *ayllu* or the pastoral segmentary lineage—that it replaced. Deep time ethnographic records indicate that organic, Dunbar-aligned tribal structures were frequently patriarchal, violently xenophobic, and locked in generational cycles of blood feuds. Old does not mean good, and small does not mean fair. While the imposed decimal grid reliably enabled totalitarianism and extortion, the organic tribe frequently enabled localized tyranny and endemic warfare.

Robust Findings

1. Nested decimal organisation is a recurrent, convergent technology designed explicitly for state legibility and control, not organic human interaction.
2. The base-10 ratio derives from human biological counting, optimizing tax, census, and military audits for a centralized bureaucracy.

3. The system inherently clashes with human cognitive architecture, which scales at a ratio of approximately three (5, 15, 50, 150) rather than ten.
4. Decimal grids routinely skip the "sympathy" (15) and "band" (50) layers, forcing a severe cognitive disconnect at the 100-person rung.
5. In military contexts (Mongol *tumen*, Roman *centuria*), decimal structures succeed by substituting lethal discipline and shared trauma for organic trust.
6. In civil contexts (Inca *pachaka*, Chinese *baojia*, Anglo-Saxon *hundred*), decimal grids are consistently resisted or subverted by pre-existing kin networks.
7. Civil decimal systems inevitably devolve into mechanisms of collective punishment, enabling financial extortion by the state.
8. Machiavellian actors routinely capture these grids by leveraging the threat of collective liability to extract bribes from the base units.
9. Psychopathic rulers deploy decimal grids intentionally to fracture rival, kin-based power centers and enforce totalitarian obedience.
10. The only decimal subunit that maps effectively to human cognition is the Roman *contubernium* (8 men) or the basic 10-person household, which mirrors the primary support clique.

Contested or Open Questions

- Can a decimal structure function voluntarily in a complex society without the threat of lethal state coercion, or is it fundamentally intertwined with violence and taxation?
- Did the Incas ever successfully integrate the organic *ayllu* into the decimal system in the central provinces, or was the decimal system a purely bureaucratic fiction recorded strictly on *quipus*?
- To what extent did the Anglo-Saxon *borh* function organically as a self-policing mechanism before Norman sheriffs fully financialized it?
- Do modern digital surveillance architectures and algorithmic social credit systems represent a frictionless return to the *baojia* system of collective liability?

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Exodus-Numbers.

Implementability after the Fall

Minimum Viable Version (Household 4–10, Village 300, District 3,000)

Without a centralized state, electrical grid, or internet, nested decimal organisation should be explicitly avoided for civil governance, as historical precedent proves it requires a coercive, extortionary bureaucracy to maintain. Instead, a hybrid system aligning closely with Dunbar's cognitive layers should be implemented.

- **Household (4 to 10):** Organised around shared hearths, caloric production, and immediate physical security.
- **Village (300):** Divided not into rigid blocks of ten, but into fluid "sympathy groups" of approximately 15 (agricultural/working guilds) and "bands" of roughly 50 (neighborhoods or geographical blocks). Two Dunbar clans of 150 compose the village, optimizing natural empathy.
- **District (3,000):** Composed of 10 villages, governed by an appellate council akin to Jethro's early nomadic model, where disputes that cannot be settled organically by the village (150–300) are elevated to regional magistrates.

What it needs to start:

Basic literacy for transparent public accounting, a shared physical ledger to record dispute precedents (replacing opaque technologies like the *quipu*), a shared solar/lunar calendar for assembly coordination, and a central meeting place capable of seating 300 individuals for direct village-level governance.

The first failure to expect:

The immediate capture of the appellate layer by a charismatic Machiavellian figure who cites security threats to impose a rigid decimal tax and conscription grid on the 3,000-person district, using the threat of external violence to justify destroying organic village autonomy to fund a standing militia.

Principles

1. Administrative grids based on multipliers of ten perfectly optimize state surveillance and taxation legibility but fundamentally violate human cognitive scaling limits.
2. Collective liability mechanisms embedded in civil decimal grids inevitably breed internal community paranoia and facilitate financial extortion by lower-level bureaucrats.
3. Military structures can successfully bypass human cognitive trust limits through the application of severe physical discipline and shared trauma at the base unit (the eight-man tent).
4. Despotic actors intentionally deploy geometric administrative grids to shatter the political power, autonomy, and resistance of organic kinship networks.
5. Sustainable, non-coercive self-governance requires institutional scales that mirror the natural cognitive ratios of 5, 15, 50, and 150.

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