

“Piles of Stuff: Haystacks, Self-Maintenance, and Discipline”

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“Hay-making is represented by poets as a scene of unalloyed pleasure. No doubt lads and lasses are then as merry and chirping as grasshoppers, but, nevertheless, in spite of buoyant spirits, hay-making, in sober truth, is a labor of much heat and great toil – the constant use of the hay-rake and pitch-fork, in hot weather, being no sinecure.”¹

NOTE: This is very drafty; please exercise forgiveness whenever needed.

Short Declarative Sentences about Maintenance and Discipline

The fundamental thing that is maintained is order. Humans (and other creatures) order their world through its manipulation.²

Maintenance is regular, knowledgeable attention to an ordered entity with the main purpose of keeping it reliable (that is, ordered in the desired way). Thus:

We could define maintenance as “disciplined attention to sustaining order.”

Absent disciplined watchfulness, you don’t have maintenance, but merely random attention and action, the effectiveness of which in maintaining order is coincidental if it exists at all.

Discipline is the core organizing principle of maintenance.

Ordering Concepts

Ordering concepts are sets of ideas and practices about and in the world that help impose and sustain order. Andrew Russell has proposed the idea of the ordering concept: “human concepts and strategies to organize and use information” using modularity as applied in several fields as

¹ Henry Stephens, *The Book of the Farm : Detailing the Labours of the Farmer, Farm-Steward, Ploughman, Shepherd, Hedger, Cattle-Man, Field-Worker and Dairy-Maid* (Edinburgh: W. Blackwood, 1844), Vol 1, 248.

²“It is difficult to understand our psychological dependence on objects as long as we hold to the belief that human beings are naturally in control of what happens in their minds. This cozy anthropocentric illusion is a useful prejudice in navigating through the shoals of life, but it does not bear up well under closer examination. The fact is that our hold over mental processes is extremely precarious even in the best of times. . . . Contrary to what we ordinarily believe, consciousness is not a stable, self-regulating entity. When left to itself, deprived of organized sensory input, the mind begins to wander and is soon prey to unbridled hallucinations. Most people require an external order to keep randomness from invading their mind.” Mihaly Csikszentmihalyi, "Why We Need Things," in *History from Things: Essays on Material Culture*, ed. Steven D. Lubar and W. D. Kingery (Washington, D.C.: Smithsonian Institution Press, 1993), 22.

an example. He argues that “Modularity emerged from all of these contexts as a technical, aesthetic, and power-laden concept. In short, for people who needed tools to conceptualize and master complexity, modularity provided an obvious and powerful solution, perhaps even a glimpse of the deep structure of nature itself.”³ I have suggested ideas and practices of purity and cleanliness as an ordering concept, again in several different fields of action and inquiry.⁴ Here, I propose the pile - and piling - in its multiple forms as yet another ordering concept.

Piles and Piling

Piles abet order. Sorting – differentiating one type of material or object from another - more often than not involves pile-making. Moving any other than a tiny quantity of material produces a pile. Materials – including foods - intended for use away from their origins are often stored in piles that are by definition temporary, or at least are intended to be. Some piles, though, are intended for eternity – burial and other ceremonial mounds – and some, though maybe not planned, last a long time anyway – shell middens, for example. Ramparts and other defensive piles are important maintainers of order. Some piles are productive; compost piles, piles of silage. Some piles need to be replenished constantly; piles of coal at power plants, for example, are constantly being both constructed and torn down.⁵

Evidence that piles are essential to ordering the world is found among animals. Animal piles; some octopi construct defensive piles, concealing their lairs; chimpanzees pile leaves to block the flow of water; elephants pile logs to help reach into trees; and several small rodents make and store hay.⁶

Simple piling suggests stacking – a more orderly pile. Stacks have more uniform elements – sometimes modular - and can be quite maintenance free. It is not difficult to imagine that the stones cleared from a field would first be piled (the ground thus being ordered), perhaps in a line to avoid lugging them any distance. Stacking them to form borders and boundaries is a logical step; walls.⁷ Likewise, shaping materials for stacking seems a small step from either simply

³ Andrew L. Russell, "Modularity: An Interdisciplinary History of an Ordering Concept," *Information and Culture: A Journal of History* 47, no. 3 (2012): 257-87.

⁴ “Pure, Clean, and Orderly” Paper presented at the Annual Meeting of the Society for the History of Technology, Albuquerque, NM October 2015.

⁵ I know of no work on the history or piles and piling. Studies of various sorts of piles and stacks certainly exist.

⁶ See Richard F. Ambrose, "Midden Formation by Octopuses: The Role of Biotic and Abiotic Factors," *Marine Behaviour and Physiology* 10, no. 2 (1983). Also: Robert W. Shumaker, *Animal Tool Behavior: The Use and Manufacture of Tools by Animals*, ed. Kristina R. Walkup and Benjamin B. Beck, Rev. and updated ed. ed. (Baltimore: Johns Hopkins University Press, 2011). "Not only do living things lessen the disorder in their environments; they are in themselves, their skeletons and their flesh, vesicles and membranes, shells and carapaces, leaves and blossoms, circulatory systems and metabolic pathways - miracles of pattern and structure. It sometimes seems as if curbing entropy is our quixotic purpose in this universe." James Gleick, *The Information: A History, a Theory, a Flood* (New York: Pantheon Books, 2011), 282.

⁷ Though this practice no doubt is ancient, in “New England stone walls evolved first as linear rock piles, the aftermath of clearing land of tree stumps and stones, and until the 1850s worked as fences only when topped with rails split from logs.” John R. Stilgoe, *Outside Lies Magic: Regaining History and Awareness in Everyday Places* (New York: Walker and Co., 1998), 105-06.

amassing materials. Once you have relatively stable shapes, large constructions become possible; certain well-known monumental structures are in essence stacks of stones.⁸ Given a chance, apes will stack boxes to reach high goals.⁹

A Brief History of Hay or, the Underappreciated Ubiquity of Hay

In 2015, hay was the third largest crop harvested in the United States, trailing only corn and soybeans.¹⁰ It is not an exaggeration to say that hay is one of the true essentials of agriculture. In most of the world, raising livestock for meat or dairy would not be possible without hay.¹¹

This has, of course long been true; hay is an ancient crop, acknowledged in portrayals of all sorts going back at least two thousand years or more.¹² In and after the 15th century, hay, as with other elements of agriculture, became the focus of intense interest in England. Most of the books, pamphlets, and other writings focused on spreading knowledge of better, more efficient use of farmland and other agricultural resources.

We can view this as regularizing haymaking – propounding some universal set of knowledge that will improve the process, that is, making hay reliable. Disciplined haymaking, in other words, with as little wasted activity as possible. The result would be increased yields, and better storage and utilization of the hay.

Much of what the English farming manuals relate about haymaking is not newly developed knowledge, but rather traditional understandings and methods.¹³ Mowing the grass at right time, when the plants contained maximum nutrition; perhaps the most famous agriculturalist of the 18th century, Jethro Tull, put it this way: “[grass] must be cut before the flowers appear; for when it stands till full-blown, the most spirituous, volatile, and nourishing parts of its juices are spent on the next generation . . .”¹⁴ Each step in the making of hay was subject to examination and the

⁸ Pyramids, for example.

⁹ See, for example, Shumaker, 201-02.

¹⁰ United States Department of Agriculture, "Crop Values 2015 Summary (February 2016)," ed. USDA (Washington, D.C.2016), "Field and Miscellaneous Crops Price –United States:2013-15" p. 9.

¹¹ "To keep sheep for the fold, horses for the plough and cows for the pail, the husbandman needed grass. But grass stopped growing in the winter months, so that the summer growth had partly to be preserved for the winter, in the form of hay. Without hay there could be no livestock, and therefore little corn, and most people would starve. True, straw could be fed to the stock in the winter, and was, with a bit of luck, enough to keep them just alive, but without the hay there could have been little or no straw crop in the first place." Eric Kerridge, *Farmers of Old England* (Totowa, NJ: Rowman and Littlefield, 1973), 20-21. Note that hay also makes possible wintertime cheese making. Kerridge, *Farmers*, 90.

¹² The database part of the absolutely astounding web site "Hay in Art" (Alan Ritch, "Hay in Art," <http://www.hayinart.com/>.) has the oldest portrayal as Trajan's Column, ca. 113 AD.

¹³ "Only here and there in the general text-books are local methods accurately described, and even these many have been copied from some earlier writer - the methods themselves were, of course, likely to have been traditional, so both earlier writer and copier may have told a true story." G. E. Fussell, *More Old English Farming Books : From Tull to the Board of Agriculture, 1731 to 1793* (London: Crosby Lockwood and Sons, Ltd., 1950), 152.

¹⁴ Jethro Tull, *Horse-Hoeing Husbandry: Or, an Essay on the Principles of Vegetation and Tillage : Designed to Introduce a New Method of Culture, Whereby the Produce of Land Will Be Increased, and the Usual Expence Lessened : Together with Accurate Descriptions and Cuts of the Instruments Employed in It*, 3rd ed. (London: A. Millar, 1751), 173.

laying out of specific times and methods for performance; dewy mornings, when the grass “stands best to the scythe,” were for mowing; when the sun was high, “the mower will employ his time more usefully in making the hay already cut, than in continuing to mow.”¹⁵ Likewise for constructing windrows, and turning the not-yet-hay so it can dry (called “tedding”), gathering the somewhat dried hay into small sheaves, then into larger stooks, left in the field to dry to the correct level, then, at last, gathering the stooks into hay stacks, or cocks, to be left in the field until needed.

The problems were many: rain at the wrong time could keep the harvest from happening, or wet newly-mown hay, causing it to mold. Disciplined eyes needed to watch and disciplined backs needed to work to prevent such things from happening. Drying too much, or not enough, were equally problematic. Dried too much in the field, valuable leaves and buds dropped off the hay in handling and transport. Too much moisture left in the hay could induce fermentation, and the heat thus produced could set the stack afire. In the field, this only causes a loss of hay; if in the barn, however, losses could be large.¹⁶

18th century innovations in hay mostly consisted of acknowledging the usefulness of and nutrition in “artificial grasses,” that is, grasses grown in pastures for hay on purpose, rather than relying solely on those already there. As one 1790 author put it, “That much of our meadow and pasture land may be rendered infinitely more valuable than it is at present, by the introduction of some of our best grasses, is an opinion which has long prevailed among many of the more enlightened agriculturists of the present age . . .”¹⁷

Hay played a considerable role in agriculture’s mechanization in the 18th and 19th centuries. Jethro Tull devised his famous seed drill “because he found that his plan for sowing the farm with sainfoin [one of the “artificial grasses”] in a new manner was hindered by his labourers’

¹⁵ A Society of Gentlemen, *The Complete Farmer, or, a General Dictionary of Husbandry, in All Its Branches; Containing the Various Methods of Cultivating and Improving Every Species of Land, According to the Precepts of Both the Old and New Husbandry*. (London: Society for the Encouragement of Arts, Manufactures, and Commerce, 1776), 315.

¹⁶ This was known from the earliest days of haymaking, no doubt from cruel experience. From Pliny the Elder, 1st c. CE: “When the grass is cut it should be turned towards the sun and must never be stacked until it is quite dry. If this last precaution is not carefully taken, a kind of vapor will be seen arising from the rick in the morning, and as soon as the sun is up it will ignite to a certainty and so be consumed.” Charles A. Browne, *The Spontaneous Combustion of Hay*, Technical Bulletin No. 141 (Washington, D.C.: United States Department of Agriculture, 1929), 3.

¹⁷ William Curtis, *Practical Observations on the British Grasses Best Adapted to the Laying Down, or Improving of, Meadows and Pastures: To Which Is Added, an Enumeration of the British Grasses*, 2nd ed. (London: Printed by Couchman and Fry, and published by the author, 1790), 1. Quoting from an earlier work, he continued: “It is wonderful to see how long mankind has neglected to make a proper advantage of plants of such importance, and which in almost every country are the chief food of cattle. The farmer, for want of distinguishing and selecting grasses for seed, fills his pastures either with weeds, or bad or improper grasses; when, by making a right choice, after some trials, he might be sure of the best grass, and in the greatest abundance that his land admits of. At present, if a farmer wants to lay down his land to grass, what does he do? He either takes his seeds indiscriminately from his own foul hay-rick, or send to his next neighbour for a supply. By this means (besides a certain mixture of all sorts of rubbish, which must necessarily happen), if he chances to have a large proportion of good seeds, it is not unlikely but that what he intends for dry land may come from moist, where it grew naturally, and the contrary.” Benjamin Stillingfleet, *Miscellaneous Tracts Relating to Natural History, Husbandry, and Physick: To Which Is Added the Calendar of Flora*, 3rd ed. (London 1765), 365.

distaste for his methods.”¹⁸ Clarence Danhof places hay right at the beginning of 19th century mechanization:

The history of the shift from human to animal labor, which characterized the half century, begins with the hay rake. The harvesting of grass was one of the great bottlenecks in the applied technology of husbandry; the labor required setting firm limits on the number of animals that could be wintered and the quality of the care that they could be given. The problem also set limits on the direct income of many farms since, in an age of horse transportation, hay was an important cash crop on farms located close to urban centers or on waterways down which the heavy and bulky product could be economically moved to market.¹⁹

None of these innovations changed the essence of haymaking; it still required skilled, and disciplined labor to make good hay – sun shining or not – and good hay was essential to piles of hay that lasted without further care – that is, self-maintaining haystacks.²⁰

Haystacks as an Illustration of a Self-Maintaining Pile

Very little has been written on the actual process of stacking hay to make it last. Many of the older farm manuals contain some brief descriptions, but not the sort of extensive writing about how to do, even as with making the hay. Perhaps it was assumed that people knew how to do it – traditional knowledge that did not need improvement, and thus did not need explication. Nonetheless, what can be pieced together is that, once again, care and disciplined knowledge and action were required to stack hay well and reliably.

Stacks were built on layers of brush, or platforms resting on rocks, so that the hay itself had no contact with the ground. Thorny branches used thus could provide some protection from rodents. The shape of the stack was key, although variations worked. Hay is “pile[d] up, widening as the come towards the middle, and afterwards narrowing the stack, till it is brought to a point; the whole, in some measure, resembling the figure of a cone; the outsides are well raked, and the top is capped with some good straw, tied fast to the pole.” This assured that the hay “is not only secured from the depredations of the rats, which cannot enter it, but from damage by the weather.”²¹ Sometimes a central pole was used to stabilize the stack; sometimes not.²² The hay,

¹⁸ Fussell, *More Old English Farming Books*, 4.

¹⁹ Clarence Danhof, "Gathering the Grass," *Agricultural History* 30, no. 4 (1956): 169.

²⁰ The work and discipline required to make hay successfully over generations, as well as an outline of the history of haymaking, is traced in very moving ways in Steven R. Hoffbeck, *The Haymakers : A Chronicle of Five Farm Families* (St. Paul, Minn.2000).

²¹ *Foreign Essays on Agriculture and Arts : Consisting Chiefly of the Most Curious Discoveries Made in the Several Provinces of France, Germany, Flanders, Sweden, Italy, Switzerland, &C. And Communicated by the Learned in Those Countries for the Improvement of British Husbandry*, (London: J. Lister, 1765), 25.

²² A possible answer to the origins of pairing needles with haystacks is found in David Ward Tresemer, *The Scythe Book : Mowing Hay, Cutting Weeds, and Harvesting Small Grains, with Hand Tools* (Brattleboro, Vt.1981), 59. He identifies “hay pins” as “. long, thin metal rods which, like hairpins, were stuck down into the hay to hold the top of the load fixed to the grass beneath it.”

passed up to the stackers by a raft of rake-wielding workers, was placed carefully, and pressed down with their feet, both because a denser stack was more stable, and it blocked wind and rain from penetrating the interior of the stack. When it reached its full height, it might be formally thatched, that is, a thick layer of tightly bundled straw placed on top, securely fastened. The exterior was raked; loose hanging straw removed, and the outer layer aligned so as to shed water.

Geographic and cultural differences in the details and shapes of haystacks are common. Indeed, even within cultures, “men argued about technique.”²³ Those differences notwithstanding, the stacking of hay remained an essential skill until well into the 19th century, and even longer in areas of the world that remained un-mechanized. Several developments, including cheap siding, readily available lumber for framing, and mechanized bailing, made outdoor stacking of hay increasingly obsolete.²⁴

Conclusion

If well-built, a haystack requires little to no maintenance, that is, it will retain the order imposed on it without further inputs. Even when the maintenance is built into the haystack system, though, discipline remains central. Discipline in making the hay itself is central to making sure the haystack survives by itself; the stack’s function is to preserve the properly made hay. Knowledge about how to make hay and its storage reliable is certainly important, and considerable resources have been devoted over time to gathering and disseminating that knowledge. But executing the hay-making process requires disciplined effort.²⁵

Discipline is the core organizing principle of maintenance. That discipline, though, can be effected at any point in the production; it is, we might say, transportable or transposable between process and product. A more reliable final product can be had by imposing discipline on the production process, and then by, well, maintaining that discipline.

²³ John R. Stilgoe, *Common Landscape of America, 1580 to 1845* (New Haven: Yale University Press, 1982), 184.

²⁴ Stilgoe credits the lightning rod with at least partially killing the outdoor haystack. It greatly reduced the chances that a barn full of hay would light if struck, burning not only the hay and the barn, but most likely “their entire crop.” Stilgoe, *Common Landscape*, 184.

²⁵ It is worth noting here another source of the maintenance that gets built in to the stack; the tools used for the process must be kept in top shape. For example, the blade of the scythe, long the main tool for mowing hay, had to be honed and/or whetted regularly during mowing, and occasionally peened if the mower inadvertently hit a rock. Tool maintenance is thus a part of constructing a proper haystack. Tresemer, 24-29. Tresemer makes the point as well that disciplining the body to mow with the minimum effort, and the mind to focus on doing the job right are critical parts of making hay: ““The Zen paradox is that if I give up the hurried intention of “getting the hay in,” I will in fact cut better” 47.

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