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The Tale of Chen Qide

> I was born too late to have witnessed the glories of the founding emperors Hongwu and Yongle [1368–1424] or to have seen the brilliance of the eras of Emperors Chenghua and Hongzhi [1465–1505]. (8a)[1]

Chen Qide (pronounced Chun Chee-duh) late in life was always looking back with dismay. Not having lived during the reigns of famous emperors in the distant Ming past counts among his lesser regrets, but this is the sentiment with which he opens the essay that he signed on the Ghost Festival—the fifteenth day of the seventh lunar month of the fourteenth year of the reign of the Chongzhen emperor, or 21 August 1641 by our calendar. It was the first of two essays he would write that year and the following to describe the collapse of his world.

The world he watched collapse was his home county on the Yangzi delta, Tongxiang, a hundred kilometers southwest of Shanghai. Chen was a local schoolteacher of no noteworthy accomplishment and would be utterly forgotten today were it not for the two essays in which he describes living through the Ming dynasty's worst years of disaster. That this memoir should even have survived is remarkable. It was not put into print until 1813, when a local historian appended it to a slim volume of Chen's advice on living an ethical life titled *Chuixun puyu* (Simple words handed down to instruct). To my knowledge only one copy of *Simple Words* exists today, in the library of the University of Nanjing. That his two essays are known to historians is because the editor of the 1877 edition of the Tongxiang county gazetteer, a locally published

chronicle of county affairs, appended them to his chronology of local events at the end of the Ming. By such slender threads has Chen's account of the early 1640s survived across four centuries to feature in this book—and shape its tone and content. The text that follows intersperses passages from Chen's writing with my own commentary.

Having opened his memoir with this rather conventional piety about the greatness of earlier generations of Ming emperors, Chen Qide shifts from abstract regret to personal nostalgia.

> My memory goes back only to the opening years of the Wanli era [1573–1620] when I was just a boy and people always enjoyed bountiful harvests and prosperity. (8a)

Of Chen Qide himself we know only what he reveals in his writings, such as in this passage, which points to his having been born around 1570. He tells us something of his family life in a short piece in *Simple Words* entitled "The Ten Foundations of my Happy Life." There he delights in his good fortune of having been born into the topmost of the traditional "four categories of the people" (gentry, farmers, artisans, and merchants, in descending order of status) and of having been raised in "a family that plowed and read," meaning an educated rural family of middling wealth, which historians of the Ming call the local gentry. These privileges encouraged him to believe that "the world was an expansive place without restrictions."[2] Like other gentry youth, Chen studied hard in hope of grasping the glory of passing the civil service examinations and serving the state. Despite sitting the exam every three years through his twenties, he never managed to pass. At the age of thirty he abandoned that ambition and decided to get on with his life, turning to a career in teaching, which he pursued contentedly for the next twenty-five years. Chen was thus a responsible member of a modest, educated family comfortably nested in the lower ranks of the county elite.

To prove that the Wanli era was a time of abundance, Chen offers his best evidence:

> The price of a peck of grain never rose above 3 or 4 cents. (8a)

The term Chen uses for grain is the generic word *mi*, meaning kernel or seed. On the Yangzi delta, *mi* generally meant rice, the grain southerners

preferred over the millet and wheat of northerners. He prices rice in a unit called a *dou*, literally a scoop or bucket. Converted to Western equivalents, a *dou* is 1.2 pecks, 2.8 US gallons, or 10.7 liters. Peck is not a precise equivalent, but I use it to translate *dou* in this book. The currency Chen cites is the standard small unit of silver, *fen*, meaning "one one-hundredth," in this case, one one-hundredth of a weight known as a tael, which is the dominant accounting unit of Chinese currency.[3] The Chinese word is *liang*, but we call it tael thanks to Portuguese borrowing in the sixteenth century of the Malay word *tahil*, meaning simply "weight." A tael of silver weighed 1.3 ounces or 37.3 grams, roughly the weight of a pencil. To translate *fen*, I have opted for "cent," the literal meaning of which is one one-hundredth, in our case, of a dollar. This translation is nonstandard, and so I must remind readers that a cent of Ming silver, though only a third of a gram, was not a trivial amount. When Chen was a child, it was enough to buy a gallon of rice (for an overview of weights and currencies, please refer to table 1.1 in appendix A, "Units of Measurement").

When prices were that low, prosperity was within the reach of all, or so Chen liked to think. No one needed to worry about not having enough to eat.

> Anyone who wanted to ferment grain to make liquor just threw away the dregs. Beans and wheat were fit only to feed oxen and swine. As for fresh fish and the choicest meat, every household had all it needed. People supposed that this prosperity would go on forever. (8a)

Knowing what was coming, Chen then shades his image of easy living with a warning that prosperity can produce not only well-being but moral laxity.

> How was anyone to know that people's hearts would give way to debauchery or that Heaven would deplore the surfeit? In the blink of an eye, the year *wuzi* [1588] arrived. Drenching rains soaked us, turning near and far into one vast slough. In the following year *sichou* [1589], the earth was parched for hundreds of miles. For two months, there was not a spoonful of water in the rivers, nothing but rank weeds. (8a)

Chen Qide's memory is exactly correct. The two years 1588–89 were a time of massive natural disasters, first flooding rains, then severe drought. Being a Confucian moralist, the only way Chen could explain this double wave of disasters was to find the human failing that caused it. In his view, the plenty of the early Wanli years had frozen the people's moral compass. Rain and drought were not simply natural disasters: they were Heaven's warnings. To quantify the severity of this warning, Chen returns to the price of rice.

> At that time, if you could put together a picul [10 pecks] of grain, you could get a price of 1.6 taels of silver. The price of grain soared and stayed high for months on end. Not a blade of grass was to be seen in the fields nor a strip of bark on the trees. Refugees filled the roads, and corpses sprawled in the streets. (8a)

Pushed to a price of 16 cents per peck, rice was four to five times what it had been. At that price, the poor turned to whatever substitutes they could strip from the natural world around them, from grass to tree bark. Social disorder followed.

After the disaster of 1589, Chen jumps forward to the 1620s, when the rise of the eunuch faction under the directionless Emperor Tianqi (r. 1621–27) threw the Ming regime into a crisis of leadership, to the deep dismay of political elites as well as moralists. Chen briefly describes the disarray of that period, presenting it as a warning from Heaven, then turns to what all along had been his destination, the late years of the reign of Emperor Chongzhen (r. 1628–44) (for the titles and dates of the reigns of Ming emperors, please refer to table 1.2 in appendix B, "Reign Eras of the Ming Dynasty, 1368–1644").

> When the thirteenth year of the Chongzhen era [1640] arrived, heavy rains fell for months on end. Floodwaters rose at least two feet higher than in the *wuzi* year of the Wanli era [1588]. The entire landscape in all directions became a great swamp. Boatmen poled their way among beds and couches while fish and shrimps swam through wells and stoves. Those with upper stories resorted to them as bolt-holes while those without scrambled onto their roofs or climbed up onto

> terraces, having no thought in the morning but whether they would survive till the evening. (8b)

Again, Chen turns to the price of rice to quantify the disaster and track its course.

> The price of grain started at over 1 tael per hectoliter [10 pecks] and gradually rose to over 2 taels. After the floodwaters receded, farmers from Wuxing [the neighboring county to the northwest] fanned out across the fields of Jiaxing [the prefecture of which Tongxiang was one county] searching for sprouts, which they fought over as though these were delicacies. Not until the end of the seventh month [early September] did they depart in an unbroken line of barges. (8b)

Here Chen moves up the decimal register from peck to *shi*, literally "stone," which is loosely equivalent to a hectoliter. Dividing by ten to derive a peck price, the price in 1640 rose first to 10 cents per peck, then to 20 cents.

As happened in 1588–89, flood gave way to drought the following year. The drought of 1641 was so severe that the riverbeds ran dry and prices were pushed up to yet another level.

> The price of a hectoliter of grain was driven from 2 taels up to 3. Rural people had to pay 40 cents of silver for only 1 peck. Even though the spring wheat harvest was double what it had been in earlier years, in the end it was still not enough to feed everyone. Some ate chaff, some chewed bran, some even savored weeds and tree bark as though these were dinner and dined on chaff as an appetizer. (8b)

The economic effect of these prices was to shut down the markets. The social effects were disastrous.

> A respectable family that could feed every member two meals of flour gruel a day celebrated their great good fortune, though the vast majority had to get by on one meal a day. Husbands abandoned their wives, and fathers their sons, each fleeing in different directions in the hope of surviving. Useful objects accumulated in the markets but went unsold, as those who could have used them simply walked away after

> asking what they cost. As for works of art and fine curios, no one even stopped to ask how much. Oh, the people's poverty was extreme. (8b)

Even the pawnshops were shuttered because no one had anything left to pawn. Farmers still robust enough to work went out to plant crops, though no sooner had they done so than locusts blanketed the fields and ate everything that sprouted. The streams ran dry, and there was no water to scoop into buckets and pour on the fields. Then an epidemic broke out, likely the plague, passing through the population and infecting 50–60 percent of households. A wave of suicide—Chen calls it "going to a tree"—followed.

Chen then steers his narrative back to prices, moving from the price of rice to the price of other foods to press his point about how prices kept going up to ever more impossible levels.

> Not a single everyday item was less than several times more expensive than it had been before. Laying hens and geese were worth four to five times more than before. Even soybeans could not be bought for less than several dozen coppers. (9a)

The only food too cheap to be priced in silver was soybeans, grown to make tofu. Chen prices them in the thin minted bronze coins with a hole in the middle that were used to make small purchases. They were called *wen*, meaning "script," a reference to the reign title of the emperor during whose reign the coin was minted, which appeared on the obverse side of the coin. Again following Malay usage, Portuguese traders called this coin *caixa* (or *caxa* in Spanish), from which comes the English word "cash."[4] As cash has another meaning in English, in this book I use the old English term for a bronze coin of low value, "copper," to translate *wen*. The value of a thousand coppers was declared the nominal equivalent to one tael of silver at the start of the Ming, though copper immediately appreciated against silver, resulting in an exchange rate that hovered around seven hundred coppers per tael. Seven coppers were thus equal to one silver cent. One copper was not much money: it bought a block of tofu, a sheet of ordinary writing paper, two pairs of chopsticks, or a pound of charcoal.[5] Two coins purchased a cheap writing brush, a stick

of cypress-wood incense, or a rice-flour cake. The poorest watched their coppers closely, whereas the rich would not stoop to pick one up off the ground—unless it was to make a point about trifling profits as distinct from real values.[6] To care about one copper coin became a contemptuous figure of speech for those obsessed with money.[7] A self-respecting Buddhist mendicant would refuse one coin as alms, accepting nothing less than several dozen.[8] The fact that it took several dozen coins to buy a single block of tofu in 1641 attests that a single copper on its own was close to useless during the famine.

At these prices everything that lived was eaten.

> As a result, a family of eight, unable to feed themselves, treasured pig fodder. Middling families could not afford to raise one pig, birthing sows having long been sold off to pay expenses. Previously a stewing pig might fetch a full silver tael, but now just the pig's head cost eight- or nine-tenths of a tael. As a result, whereas in the past you heard the constant noise of chickens and dogs, now you heard them only in the markets, and then only if you listened carefully. (9a)

Chen concludes by warning readers not to treat his memoir as "the confused ramblings of an old man." They should be grateful for having survived terrible times but should not forget the loss and suffering, as though nothing terrible had happened, which was what most people wanted to do.

The disaster was not over. When Chen put down his pen on the Ghost Festival of 1641, he could not have guessed that matters would go from bad to worse. A year plus a month later, on the Mid-Autumn Festival, or 19 September 1642, Chen put pen to paper and picked up the story where he had left off the previous year. He opens with the severe shortage of rice as winter came on. Rather than high prices, there were no prices because there was no rice to which to attach a price.

> At this time there was no rice in the market to buy. Even if a dealer had grain, people passed by without asking the price. The rich were reduced to scrounging for beans or wheat, the poor for chaff or rotting garbage. Being able to buy a few pecks of chaff or bark was ecstasy. Come the spring of the fifteenth year of Chongzhen [1642], the

> countryside swarmed with people digging up the first green shoots as they sprouted. Earlier they had been selective about which plants they ate; by this point there wasn't a plant they wouldn't eat. Rural people filled their baskets and brought them in on their carrying poles, and in an instant what they brought was gone. Never had vegetables sold as fast as this. (9b)

The starving abandoned or butchered their children. The epidemic infection rate rose to 90 percent. Desperate to halt the downward spiral, people sacrificed what little food they could scrounge to the spirits in the hope of divine intervention, especially after the epidemic returned. This regrettable practice, Chen notes, only drove prices higher.

> Because the infected made rich offerings [of food to the gods], food was twice as expensive as it had been the year before. A large chicken including both drumsticks fetched 1,000 coppers. A young cock barely able to crow was still worth 500 to 600 coppers. Stewing pigs went for 5 taels, then 6, even 7. A piglet was worth from 1½ to 1⅗ taels, even as much as 1⅘ taels. By contrast, a serving girl was worth only 1,000 to 2,000 coppers. Shouldn't people be valuable and domestic livestock cheap? (9b)

Here Chen cites prices in both currencies, chickens in copper, pigs in silver, and then humans in copper. Behind the use of coppers versus silver lay a widely understood social distinction, which was that copper was for cheap things and silver for more important purchases. By pricing a serving girl in coppers, Chen is implying that chickens should be priced in coppers but not people. In this collapsed economy, prices put pigs above people.

Not until the end of the summer of 1642 when the rice crop was harvested did the disaster start to ease.

> The price of grain gradually went down. The sick started to recover, and the people regained their color, but they were saddened that those who died could not come back to life and that not all who had fled would return. (10a)

Chen concludes his second essay as he did his first, urging readers to take what happened as a warning from Heaven and pleading with them not to forget what had happened. It had been Heaven's punishment, and Heaven could punish again. As he concludes,

> Alas, in an evil time like this when misfortune strikes in successive years, not to die of starvation or disease must be counted as boundless good fortune. But if we fail to heed these warnings or to show gratitude to Heaven and Earth above and to our ancestors below, and instead just congratulate ourselves that we have survived the famine and then turn our attention entirely to acquisition and enjoyment, how can we recover our humanity? Unable to let what happened be forgotten, I have written this, my second account. (10a)

Finding a moral lesson in misfortune is a common response to hard times, especially when the commentator is a moralist such as Chen, who constantly patrolled the boundaries of the slight privilege he enjoyed at the lower edge of the county gentry, lest he slip from what he regarded as that bit of good fortune. His parents may have primed him for this mission by giving him the name Qide, which can loosely be translated as "a person of his virtue." With limited wealth and no examination credentials, Chen had only his virtue to maintain his position in society, and he was vigilant about putting it to use. As he writes in *Simple Words*, "Making yourself one one-hundredth smarter"—and here he uses the term "one *fen*," as though intelligence could be counted out just like hundredths of a tael of silver—"is not as good as reducing your attachment to everyday affairs by one one-hundredth." Or to phrase the same point differently, "Increasing your ability by one level is not as good as ridding yourself of one level of stupidity." This leads to his conclusion: "To be absorbed in worldly matters betrays a vulgar character; to tolerate your own stupidity is low class."[9]

Confucianism so closely linked ethics with cosmology that the boundary between them was almost nonexistent. Rain came from Heaven; if rain did not fall, it was because Heaven chose not to send it as a warning or a punishment. We live within a different cosmology,

though even we take disruptions in the weather and the ecology of disease as morally charged warnings of environmental degradation and climate change. So we do not stand at all that great a distance from the people of the Ming, even though our moral calculations are very differently based. My intention in this book is to recover the world of the people of the Ming by meeting them halfway. We conceptualize the world as a physical ecosystem that is vulnerable to the effects of changing conditions, they as a metaphysical board game in which Heaven directs the action. The architecture of ideas is not the same, and I see no reason to adopt Confucian logic, but I do see reason in getting as close as we can to the experience and understanding of those who experienced that time and understood it in terms meaningful to them. Without attending to what a subsistence crisis meant to them, we hollow out the past.

In fact, we and they inhabit a global ecosystem that was and is prone to disturbance, whether because human folly blocks Heaven's blessing or human-generated carbon and aerosols block the sun's energy. We also share the habit of tracking our fortunes through the prices we have to pay. This book follows Chen Qide's lead and tracks grain prices, not as a barometer of Heaven's displeasure but as a measure of climate change. Consider it an extended footnote to Chen's account of the disasters of 1640–42.

A Ming Understanding of Prices

It might help to launch this footnote by asking what Chen and his contemporaries understood when they talked about prices. Believing that the world was best when nothing changed, they hoped prices would do the same. Everyone knew that prices moved seasonally in response to supply and demand, and that in normal times that movement should bring a price back to where it had earlier been, not push it up to a new, higher level. The language that expressed this aspiration for stability was that a price should be "level" (*ping*) or stable. Stability was important not just for anticipating how to manage the cost of living, but because an unstable price was unfair to someone. Price unfairness offended against the quality they called *gongping*, "level for all," which is to say in

the public interest of all (*gong*) and treating all equally (*ping*).[10] A fair price was one that both buyer and seller could accept because it met a shared expectation. An abnormal price favoring one side over the other was not fair because the exchange created a relationship in which one person benefited at the expense of the other.

The best of all possible worlds was one in which "grain should be plentiful and prices fair, so that the crowing of roosters and the barking of dogs echo each other" between one prosperous and self-sufficient village and the next. According to this model, "people should not face the trouble of having to ship things over great distances in order to garner adequate profits."[11] These are the words of Shanghai native Xu Guangqi. Xu was one of a small number of educated Chinese who converted to Catholicism early in the seventeenth century (he took the baptismal name of Paolo). His knowledge of European Christianity equipped him to draw on both Christian and Confucian commitments to serve his emperor, rising eventually to the highest post of chief grand secretary just before his death in 1633. Paolo Xu wrote his comment about an economy that did not have to rely on long-distance trade in the mid-1620s at a time when court politics were in disarray but climate-driven calamities had sufficiently paused that people could begin again to imagine how the world would be best ordered. His intention was not to deny the necessity of commercial exchange, as some Confucian fundamentalists might have done, but to imagine a system in which commercial exchange brought benefits in which everyone could share, and which kept prices fair.

Merchants of the time offered the same argument—that trade leveled prices—to justify their work. As a declaration posted in a town square just west of Shanghai to protect the cloth merchants' guild put it in 1638, members of the guild "swapped prices to make a living." They bought at one price and sold at another, "always buying at a fair price and selling at a fair price, not cheating even a child," so that people could enjoy access to goods not immediately available to them. They wished to be seen as virtuous men performing an essential economic function, not as parasitic exploiters of producers or consumers. As the public declaration phrased this, they "set their prices according to the quality of the goods so that people can exchange what they have for what they

lack."[12] Public sentiment was not always persuaded, especially that year as China edged toward the worst climate collapse of the millennium, but the argument nonetheless enjoyed some credit.

Chinese were not alone in believing that prices should be stable and that trade could be a means of achieving this fairness. Europeans developed an analogous discourse of just prices based on the conviction that prices should be stable, while also recognizing that of all prices, grain was usually the most volatile.[13] The idea that keeping prices stable and fair was not just a positive benefit but an act of justice was a view popular among seventeenth-century English advocates of trade. Rather than favor "the inequality whereby the one thing exceeds the other," pricing should "endeavor to bring them both to an equality," as Gerard de Malynes wrote in his handbook on commercial practices published in 1622, in the same decade that Paolo Xu offered his vision of an agricultural economy that commerce serviced in the common interest. "Equality is nothing else but a mutual voluntary estimation of things made in good order and true." Reasoning in similar terms, draper William Scott in 1635 declared prices to be the true measure of things in a just system. "As time is the measure of business, so is price of wares. If the price exceed the worth of the thing, or the thing exceed the price, the equality of justice is taken away." Economic historian Craig Muldrew explains that these writers believed that "a fair and just price was also the cheapest price." Fair prices served to "ensure that a free supply of goods was available equally to all, so that goods could be afforded by the poor as well as the rich." For it to be fair, a price had to be cheap enough for everyone to afford, yet also "high enough so that profits could be made, without which no one could have afforded to purchase anything else."[14]

The people of the Ming understood the logic of letting supply and demand determine fair prices, though they would have thought of this mechanism more in terms of the exercise of personal virtue than the working of abstract justice. Granting agency to the market as an autonomous generator of justice would not have been an argument that Ming observers were quite willing to make. The Confucian allergy to the use of the word "profit" to do anything but condemn private benefit over public good induced Ming writers to veer away from the idea that profit

could be a mechanism for achieving justice. Prices were fair to the extent that both sides of the exchange benefited and neither profited at the expense of the other. In that context, people allowed that an open market was conducive to fairness. Accordingly, when speaking of a price that was fair, the term they often used was "market price" or "current price." To record that a transaction was carried out on the basis of market prices was to register approval of that transaction.[15]

Fairness did not rule out the reasonable use of market forces to ensure that the producer was fully recompensed for his products. The farmer with crops to sell who "waited out the time in order to wait for the price" was not condemned for doing so, simply understood as acting reasonably in his own interest within the terms of market exchange to obtain what for him was a fair price for his harvest.[16] So too when a merchant moved goods from markets where they were cheap to markets where they were more expensive, so long as he conformed to prevailing current prices in both markets, he was understood as serving the public good even as he garnered a percentage for himself. "Regardless of whether we are talking about state grain or people's grain, the price should always rise and fall with the current price and should not be forced up or down," argued famine-relief expert Yu Sen. That way, "when the price is high, merchants coming from far away will naturally be numerous. Grain being abundant, the price will level itself." This was how private commerce could serve the public interest. Yu accounts for its capacity to do so not by invoking the magic of the market, as his English counterparts might, but by referencing the Confucian notion that extremes tended to move toward the middle. As he concludes, simply, this movement "is something that the innate tendency of things makes inexorably so."[17]

The Presence of the State

Confucian thinkers such as Chen Qide, clinging to the lower edge of his county's social elite, concerned themselves with unfair prices and the limits of people's ability to afford them in times of crisis. Not always confident that markets would deliver goods at affordable prices, however, they held the view that when prices became unfair, the

government should intervene to *ping* them, to "level" them to the amounts that people expected and could afford to pay. This is what the Ming state did, through several different mechanisms.

The most basic mechanism to ensure the affordability of grain was reporting. Local magistrates were tasked with monitoring grain prices in their counties, sending agents into the local markets every ten days to record prices and look for signs that they might be rising. Magistrates then forwarded this information monthly to the capital so that the court could keep abreast of food supply conditions across the realm.[18] In Beijing, the underlings assigned this task were agents of the dreaded Eastern Depot, the Imperial Household's intelligence agency. These men descended on markets in the capital on the last day of every month to check the prices of rice and other grains, and also of beans and cooking oil. The data they gathered allowed the court to know whether agriculture was flourishing. They could also be examined to determine whether merchants might be blocking commercial circulation of grain in order to drive up prices.[19] Though merchants were eager to represent themselves as fair dealers, no one quite trusted them in an economy in which there was little price transparency beyond what the next dealer down the street was charging. Coupled with this distrust was the inevitable relaxation over time of state scrutiny of prices. Institutional entropy led in 1552 to reducing the monthly price check to twice a year, in February and August.[20] By the 1570s, this mechanism seems to have fallen out of practice in most places except Beijing, where market price surveillance continued at least into the 1630s in order to anticipate threats to the stability of the capital.

In a crisis, the Ming state could intervene in ways more aggressive than data collection.[21] Sometimes it mandated the prices at which commodities should be sold. For example, an imperial edict issued during a famine in 1444 imposed an official price below the market price and required merchants to sell their grain at this reduced price.[22] When famine struck the Beijing region two decades later, however, the court adopted a different approach. Rather than setting a price, the capital censor issued a strong warning against price gouging. "In towns in many areas there may be strongmen and brokers who monopolize businesses

and markets and make the price of grain and other commodities expensive when they should be cheap, and cheap when they should be expensive, entirely in order to make big profits and enrich themselves,"[23] he warned. Local officials should take action when they discovered that prices were being manipulated in such ways. An edict of 1523 repeated this warning more gently, reminding shopkeepers that "those who demand unfair prices" will be punished.[24] At the local level, judges had a free hand to prosecute merchants engaging in fraudulent pricing.[25] It was accepted in principle that merchants were the agents of healthy markets, yet as one magistrate wryly observed, "letting a broker in the market set commodity prices" would be like "allowing students to monitor their own misdeeds in school."[26]

More often than setting grain prices, the state intervened to influence them by releasing government grain stocks onto the market at prices that would compel grain merchants to lower the market price. Officials could also intervene by imposing blockades to prevent dealers from taking grain out of distressed economies to locations where they could make an even greater profit. "By imposing a ban at the right time," an official in South Zhili (the metropolitan province around the southern capital of Nanjing) advised a subordinate in the 1540s, "the price of rice will remain fair and the people have more than enough food for their use."[27] A century later, during the crisis that Chen Qide has described, a grand coordinator in South Zhili (where Chen's county was located) issued a proclamation imposing this ban in Suzhou. "The rice grown here under ordinary circumstances is not sufficient to meet local demand," he stated in his public proclamation. "Not only do parts of Zhejiang rely on shipping rice in from Jiangxi and Huguang provinces, but Suzhou also looks to this rice as the manna on which it survives." The grand coordinator reminded grain merchants of an earlier provincial prohibition "forbidding dealers from elsewhere from taking grain stored in the city of Suzhou and selling it elsewhere at a high price, leaving Suzhou empty as a result." He also ordered merchants further up the Yangzi River to keep the supply of grain flowing.[28] The history of Ming prices thus cannot be written in the absence of Ming state actors.[29]

The Ming state mattered to the prevailing price regime not only because it could intervene to affect prices, but also because it was a major buyer in the economy. The early Ming state to some extent bypassed prices by relying on requisitions and corvée (forced labor) to meet its needs for goods and services. Still, the government needed to make purchases, and the founding emperor was adamant that his officials pay for these purchases at market rates so as not to drive dealers into bankruptcy or interfere with the prices ordinary people paid. He even tried in 1397 to impose a law that made selling goods in the capital above "current value" a capital crime. His son, Emperor Yongle, reiterated this measure during his first year on the throne in 1403, extending the rule not just to the capital but everywhere throughout the realm right down to the villages.[30] These and other laws found their way into the Ming Code, the imperial law book, which scheduled punishments in relation to how much the price a seller charged deviated from the fair market price.[31]

By the sixteenth century, the state's involvement in the market was vastly greater as a result of shifting from requisitions and corvée to purchasing goods and services on the market with silver raised through taxation, and always, at least in principle, at market rates.[32] Underlying all these rules was the fundamental Confucian commitment to the idea that agents of the state should not act to compromise or erode the welfare of the people. In practice, of course, price exchange was a rough-and-tumble zone where officials, like everyone else, were out for themselves. For Confucian moralists this was a constant worry, just as it was for their Christian contemporaries. In his study of money and prices from that period, historian Jacques Le Goff notes the moralists' anxiety about the loss of true value in the face of money. If anything served to constrain the reduction of everything to a price, it was the Christian virtue of caritas, the care of others that was part of what was termed the care of souls, including one's own, so as to earn sufficient virtue to be admitted to Heaven. As long as caritas was in play, the abstraction of money was not powerful enough to clear a way for capitalism to override the obligations of justice.[33] People of the Ming would have recognized the virtue of such constraint, though they would have understood it in

the Confucian terms of mutual obligation rather than the salvation of souls. The notion that money was part of the arrangements by which human beings were subordinated to the grace of God, however, they would have found puzzling, even incoherent. Where the people of the Ming shared a certain anxiety with their European contemporaries, it was over the danger of allowing greed to overwhelm obligation and letting money and prices to drive out reciprocity and alienate the poor from the rich. "The lord of silver rules Heaven and the god of copper cash reigns over the earth," as one disgruntled Confucian magistrate railed in 1609. "Avarice is without limit, flesh injures bone, everything is for personal pleasure, and nothing can be let slip," he continued. "In dealings with others, everything is recompensed down to the last hair."[34] The moral limits that should constrain economic behavior were entirely absent when dealers set prices.

At both ends of Eurasia, then, people experiencing the early phase of the economic growth that marked what is now called early modernity worried that price calculations and the pursuit of wealth were eclipsing calculations of virtue and care. As Chen Qide warned his readers at the close of his second essay, "If we just congratulate ourselves that we have survived the famine and then turn our attentions entirely to acquisition and enjoyment, how can we recover our humanity?" Wild prices were a warning.

Prices as Data

The task of this book is to scale up Chen's two years of price history in Tongxiang county to the national and dynastic level. It won't be easy. Chen had the advantage of living within the price regime that he knew as intimately and in as complete detail as we know the prices of everything around us in our own price regime. He could simply mention a price and expect his readers to know how far it diverged from what was fair and what that divergence meant. We therefore have to make up for our ignorance of his world by reconstructing the price regime within which he lived. Determining what things cost in the Ming period sounds like a simple technical task and a modest intellectual goal. It is neither.

Price records in a precapitalist economy are difficult to find, haphazard when found, and always incomplete.

Despite these difficulties, one thing that makes the reconstruction of the price history of Ming China possible is the attention that people of the time paid to prices. They knew that they inhabited a world in which everything—beans and rice, hens and maidservants, careers and survival—carried a price tag. When a palace eunuch offered to buy a military hero's sword in 1570, the soldier responded by demanding to know how such a thing "could be treated as a commodity," and yet the price offered was too attractive. He jettisoned his rhetoric and let the sale go ahead.[35] While moralists might insist that there were things that were not for sale and could not be priced, most regarded this view as quaintly sentimental at best, self-deluding at worst.

People kept themselves apprised of what things cost so that they would know what to buy or sell, and when and where to do so, or sometimes just to preserve a record of what they spent. A few even entered these prices in their diaries, letters, and reports, which is the haystack where the historian can go to find these needles. An instructive example is a text to commemorate the hanging in 1612 of a new bronze bell at Miyin Monastery in Chen Qide's county of Tongxiang. The text has survived because the author, a retired official named Li Le from the city of Hangzhou some sixty kilometers to the southwest, included it in his commonplace book *Jianwen zaji* (Notes on things I have seen and heard).[36] Li explains that he and others mounted the project to replace the original bell that the provincial government had confiscated and melted down to make firearms in 1544 during one of the waves of piracy in those years. He includes many figures in this text: the minimum gift that would get a donor's name into the official register of donations (3 taels); the amount of silver he and his friends raised in the first two months (200 taels) and then in the third month (another 200 taels); the amount of silver one of them took to the Ministry of Works in Nanjing for clearance to purchase over 1,600 kilograms of copper and tin (270 taels), which also yielded a ministry call to merchants to make the metal available "at a fair price"; a ministry authorization to waive tolls when shipping the metal to Tongxiang (which Li writes was worth "at least 60 taels");

the cost of restoring the brickwork on the bell tower (16 taels); reimbursement for costs borne by the monks at Miyin (30 taels); the bell caster's fee (35 taels); the cost of buying and inscribing the stone stele on which this text was incised (10 taels); and finally, an offering to Wenchang, the god of literate culture, to ensure the success of the project (40 taels). Li does not list enough figures to put together a complete account, though that was not his purpose. Posting the sums in full public view was a bid to protect the investment against later encroachment or theft.

While the exact reporting of actual costs and prices that this sort of purpose encouraged has left a vast archive of Ming prices, the data are scattered, inconsistent, and not easily summarized into statistics. This fact rather works against the initial appeal of prices as apparently hard facts and reliable data. When economic historian Earl Hamilton asserted in 1944 that prices are "the oldest continuous objective economic data in existence," he did so on the basis of the considerable surviving records of prices in Europe.[37] Hamilton was confident that the prices he found in European documents could be used not just to track price changes but to rewrite the narrative of historical change in the early modern world. To an extent, his confidence proved to be well placed in terms of yielding insights into historical change, yet no set of price data is without its ambiguities. Some prices may meet Hamilton's standard, yet the reader will see that prices are rarely the sturdy facts they appear to be.

Take the price of a Ming bucket, for instance. A Beijing magistrate recorded that in 1577 his office bought buckets for three silver cents each.[38] Is that what a bucket cost in the Ming? Possibly, though not all buckets are the same. What is the price of one bucket in a certain place and time might not be the price of a bucket in another place and time. Then there is the price itself. Three cents may have been the price his office paid, but did it involve a surcharge or a discount? Was it actually paid in silver, or was it paid in copper coins, and if so, at what rate of exchange? I raise these questions not to undermine the viability of price history but simply to note that the concrete price that someone said they paid at a particular place and time may not be what the thing paid for actually cost. If we turn to the records of a magistrate in the Zhejiang

hinterland fifteen years earlier, we find that his bucket price was four cents.[39] Did the price of buckets fall over those fifteen years? Unlikely. Were rural prices higher than urban? Again, unlikely. Did the Beijing office buy so many more buckets than the rural office that it was able to obtain a volume discount? Possibly so, since the Beijing office was obliged to supply many more agencies with buckets than was a magistrate's office in a rural town. Or was it, more simply, that the Beijing bucket was small, cheap, and poorly made compared to the Zhejiang bucket? We have no way of knowing. The most we can conclude is that a sixteenth-century Ming bucket cost between three and four cents.

If the price in silver of a thing is complicated by the multiplicity of things, so too is it troubled by the mutability of silver. As historian Bruce Rusk reminds us in his delightful essay on the culture of silver in Ming and Qing texts, using unminted bullion rather than sovereign coins complicated the experience of exchange hugely. Just like a bucket, silver did not exist solely in its abstract function as currency. The metal came in many degrees of purity, some acceptable and some not. It could be adulterated and faked by those who knew what they were doing. Whether buyer and seller both accepted a particular weight of silver as payment depended on the many noneconomic factors shaping the social nature of the exchange, most especially, trust and face. As Rusk writes, "Although the market of value of a lump of silver might seem to be the simple arithmetic product of its weight and its purity, these two inputs were not free-floating variables, even when they could be so treated for accounting purposes. Silver retained an inalienable physicality: to function as an abstraction, a piece of silver had to produce a consensus about its level of purity."[40] The physicality of silver certainly distorted (or at least influenced) prices, though we cannot possibly access the quality of silver used in any particular transaction four centuries ago. Every recorded price is thus potentially as troubled by the metal that changed hands in exchange for the good or service that was purchased as by the quality of that good or the nature of that service.

"Price history at its best," to quote Earl Hamilton again, is supposed to deal with "only prices and wages actually paid in an open market by agents free from political or ecclesiastical coercion."[41] While I might like

to be Hamilton's "careful price historian" who "avoids distortions by differences in the quantity purchased, seasons of the year, conditions of sale, transportation costs, services rendered, hidden charges, supplementary wages in kind, and the like," the documentary record does not allow me to meet that standard. Most Ming price data reach us not from the "open market" but from administrative records kept at the local level by government officials for the purpose of drawing up budgets and keeping accounts. They were supposed to follow market prices, though whether that happened the day they went to buy buckets, we cannot say. In the case of Ming China, most of the price data available to us were recorded at the point where state and economy met.

Forty years ago, historian Michel Cartier, recognizing the need for market prices to write price history, warned his colleagues about the perils of writing price history from such administrative documents. He doubted, in fact, that a history of Chinese prices was even possible before the eighteenth century.[42] Much of what survive in the Chinese record are in fact fiscal prices, that is, prices determined in the context of tax assessments. Fiscal price and market price may be in calling distance of each other, but not necessarily. Fiscal prices were often what Cartier termed "fossilized prices" set in relation to earlier market values and not subsequently adjusted. Sometimes these fossilized prices were replaced by artificial equivalents when local administrations converted their financial operations from taxes and salaries in kind to taxes and salaries in silver, as they did over the course of the sixteenth century, though how closely that conversion followed market prices is difficult to assess.

It is true that most of the prices I have recovered were compiled for noneconomic purposes: for the fiscal purpose of manipulating quota prices rather than to document market prices, or the administrative purpose of controlling graft, or the moral purpose of forcing prices into a fairer register, or the rhetorical purpose of narrating prosperity and decline. But price historians of China are not alone in facing these challenges. Five years before Hamilton made his cheerful pitch for the objectivity of price history, William Beveridge in the introduction to his history of prices in early modern England observed that "price history is a study not of isolated facts but of relations."[43] Prices are "the outcome

of transactions" that arise in the context of a host of noneconomic factors.[44] In fact, it was often the relational character of prices rather than their purity as data that persuaded people in the past to write them down. This relationality is what makes them so valuable for the kind of history I offer in this book, which focuses more on understanding Ming society than Ming economy.

The Limits of the Possible

Two prices historians of Scotland have wisely cautioned that "prices and wages were real things that people paid and received, and on which the quality of their existence, and occasionally indeed their very lives, depended. The inner meaning and interpretation of the data may be subtle and difficult. But they are not merely numerical artifacts gathered to amuse and perplex historians."[45] The propensity of prices to amuse and perplex enticed not a few Ming authors to collect and tell outrageous price stories. Wondering at the shocking gaps between rich and poor, baffled by the rapidity of the changes overtaking their lives, they expressed their bafflement and outrage through price tales that anyone could understand.

If occasionally I follow their lead and indulge in a good story, I do so to highlight the fact that Ming writers deployed prices to mark not just what things cost, but how that cost did or did not make sense in relation to everything else they knew, and as well how prices shaped the social relationships that bound people together. Of all the price stories I can tell, the best is the one I have already told, Chen Qide's account of the turmoil in the last years of the Ming dynasty. It could be objected that choosing Chen's story of spectacular disaster as the centerpiece of the book's architecture drags us away from capturing everyday life. In fact, it sheds strong light on the core issue of survival, which is when prices really mattered. The coincidence of the Ming dynasty with the middle phase of the Little Ice Age only further encourages me to treat the disasters of the 1640s as the core around which to reimagine what it meant to live in the Ming world of prices. And what better price to focus on than the price of grain, the key of human survival.

Four decades ago, historian Fernand Braudel proposed that the first task in writing a complete history of the early modern world was to evaluate "the limits of what was possible."[46] He did this in the two opening chapters of *The Structures of Everyday Life: The Limits of the Possible* by addressing the two basic features of society that determine its capacity to manage those limits: population size and food supply. The balance between mouths to feed and grain to feed them can be a delicate one in an agrarian economy reliant principally on solar energy for food production. Working from European historical records gave Braudel certain advantages compared to those of us working on other parts of the world. His cohort of demographic, climate, and price historians had access to local parish and market records that allowed them to construct price series for many commodities. Availing themselves of such documents, it was possible for them to detect long-durational shifts and to model economic, social, and even political changes over the long run. Braudel's analysis would have been unthinkable without price history.

Whereas European historical prices are mostly raw numbers preserved in handwritten archives, Chinese prices are mostly printed outcomes that have reached us via the administrative filters through which they were processed. The difference means that we write different histories.[47] But this need not rule out the possibility of historical comparison. Historical China can and should be part of what we draw on to understand the Braudelian limits of the possible. Every premodern society worked within the physical constraints of growing enough food to feed the people, or to put that in more abstract terms, the capacity to capture and transform solar energy at a level that permitted a population to reproduce itself, even in good times to expand.[48] So long as people have left records of how they accomplished this task, and sometimes failed, price history is possible. As I shall show in chapter 4, the best documentary proxies in the Chinese record regarding changes in the energy output of the sun or the accumulation of aerosols in the earth's atmosphere to block that energy are the prices to which grain rose when that energy declined—which is the record to which Chen Qide made his small but moving contribution.

That the people of the Ming lived within a price regime does not mean that we can reduce their conviction that prices should be stable to the idea

that the economy consists of fair exchanges between legal equals. As historian William Reddy has cautioned in the context of early modern Europe, prices in a commercial economy are neither conceptually abstract nor socially indifferent.[49] The idea that prices were innocent cogs in a system of just equivalences was a notion that British economic polemicists later in the seventeenth century would develop to disguise the asymmetry of monetary exchange that encouraged the growth of capitalism. A rich buyer and a poor buyer might pay the same price for something, but they parted with their money for that thing from different capacities.

Nascent economic theory in early modern Europe may have cast money as a disinterested medium by which legal equals traded goods and services, and prices as the objective means that fairly determined what should be paid, reducing prices to the mathematical abstractions by which buyers and sellers in a capitalist economy obtained a fair exchange. For those with limited means, however, prices were shackles at best, capricious furies at worst. They benefited the wealthy as they entered their sums into their account books, exploiting the neediness of the poor and exposing them to precarity. Prices became the means by which money created social structures, enabling the rich and disciplining the poor without either realizing or acknowledging how steeply tilted was the playing field of the economy in which they were positioned. A price may be "level" in relation to other prices, yet the field on which exchanges were performed through prices was anything but level. People of the Ming could agree that the best condition for achieving fair prices was an open market free of monopolistic dealers and conniving officials, but the ideology of capitalism—that capital was value-free and generative of universal benefits—did not follow; nor, for that matter, did the ideology of Confucianism as a system in which rich and poor provided mutual support. In the real world, prices arrayed rich against poor, and price-based exchanges continually reembedded unequal social relationships. Ensuring that prices were "fair" was not a bid to unshackle the economy from society. It was a bid to keep economy and society linked so that the financially advantaged and commercially astute did not deprive the poor of their means of survival, especially when climate crisis destroyed the crops in their fields.

Disaster Prices as Climate Proxies

What sets the greatest limits on what was possible in a preindustrial agrarian economy is climate. Crops require warmth and water to germinate and grow. When the supply of either is compromised, so is the production of food, and when production falls, prices rise. Grains are relatively hardy crops that can tolerate a certain measure of environmental stress, yet moisture and warmth have to stay within a certain range for the grain to sprout, grow, head, and mature. What determines temperatures and rainfall is how much energy the earth receives from the sun. The link between climate and grain prices in a preindustrial economy is fairly direct: from the amount of energy the earth receives from the sun, to the warmth and water that reach grain in the fields, to the price to buy that grain. Before the large-scale burning of hydrocarbons that has characterized industrialization, two factors could alter the short-term energy relationship between sun and earth. One is depressed solar radiation due to sunspots, or the sun's ejection of solar matter. The other, called climate forcing, is alterations in the atmosphere, whether from volcanic eruption or large-scale forest burning spewing aerosols into the atmosphere and blocking solar radiation from reaching the earth's surface. In both cases, though the mechanisms differ, the earth is deprived of its usual quantum of energy. This reduction in energy causes temperatures to fall and induces changes in the movements of winds and currents that alter patterns of precipitation.

Climate exerts an uneven impact on the earth's energy owing to regional variation in the distribution of land and water mass, yet the globe is shaped by the larger energy system that determines conditions on the earth. Climate is simultaneously local in its manifestations and global in its overall capacity and trends, though the one does not directly determine the other. The climate of a region cannot be automatically deduced from climate elsewhere. Nor can the pattern of the whole be fully constructed and understood without detailed knowledge of all local manifestations, which is why regional climate reconstruction for a zone as large as China is essential for refining and improving our knowledge of climate change.

Chinese scholars turned to the task of writing a history of China's climate in the 1930s by extracting references to natural disturbances in the dynastic histories, the official records produced after the fall of a regime by its successor. Since the 1990s, Chinese climate scientists have moved away from documentary proxies in preference for physical proxies that can be instrumentally measured. Their work has broadly confirmed that China's climate history shares global patterns derived from physical evidence collected elsewhere in the Northern Hemisphere—the Mediaeval Warm Period from the mid-tenth century to the mid-thirteenth, followed by the Little Ice Age starting in the fourteenth, deepening in the fifteenth, then sinking further through the late sixteenth to nineteenth. The most valuable physical proxies have been tree-ring data (the markings left by cellular growth indicating variations in temperature and precipitation) and glacial-ice-core analysis (of water molecules for their isotopic weight or the presence of volcanic sulfur). Both physical archives have been of great value for detecting to a high level of precision the amplitude of climate variation over time, as well as for detecting regional differences.[50] In recent decades, however, some climate scientists have begun working with historians to access climate information embedded in documentary materials, such as historical chronicles, diaries, and letters in which contemporaries recorded observations about unusual weather as they were experiencing it. These documentary proxies may lack the consistency of tree rings and water isotopes, but they tend to be consistent within a culture and can prove more sensitive—to local conditions, to moments of sudden change, and most valuably, to the impact that that change had on people's lives—than are tree rings.[51]

To this body of documentary proxies, I propose to add grain prices. As I began to detect a relationship between deviant grain prices and climate change in Ming China, I was surprised to discover that environmental history elsewhere has paid almost no attention to prices. A noteworthy exception is a short essay that economic historians Walter Bauernfeind and Ulrich Woitek published in 1999 analyzing grain prices in Germany during the Little Ice Age in relation to climate disturbances. They observed that "most recent research in economic history has rarely

focused on the influence of climatic changes on important economic and demographic variables," and that historians have sought to explain the "price revolution" of the sixteenth century "by population growth, currency debasement, and growth of money supply," assigning climatic deterioration "only a minor role."[52] Even in *Global Crisis*, his magnum opus on the global climate disasters of the 1640s, Geoffrey Parker turned to proxies other than prices. When I asked him whether there might be price research buried in his footnotes that I had not noticed, he confirmed that indeed prices played no role in his masterwork.

The neglect of prices in historical research on climate change struck me when I began to notice records in Ming local gazetteers of the prices to which grain rose during climate disturbances. A correlation between climate fluctuation and price fluctuation became most persuasive to me as I found records in local gazetteers of famine grain prices in the 1450s. When I went looking for research that might corroborate the effect of climate change on prices in other parts of the world in this period, I was pleased to discover Bruce Campbell's references to studies of price movements in *The Great Transition*, in which he uses prices not so much to reconstruct climate shifts as to register the impact of environmental conditions.[53] Campbell pays particular attention on the decade of the 1450s, tagging those years as "the coldest decade of the fifteenth century and the coldest of the Middle Ages."[54] This was when the global decline in temperatures, known as the Spörer Minimum, which began in the 1420s, dragged the Little Ice Age down to its first extremely cold phase. That the 1450s was when famine price records first began to appear with some consistency in local Ming records emboldened me to consider their correlation with climate fluctuation at the global level. Further research through to the end of the dynasty confirmed the reasonability of working from this hypothesis that prices could be treated as climate proxies. Not being trained in econometrics, I have not mathematically modeled the correlation for Ming China as Bauernfeind and Woitek did for sixteenth-century Germany, but the strong coincidence between Ming famine prices and global climate disturbances gave me the confidence that readers will accept this connection as not just intuitively obvious but theoretically compelling.[55]

I shall return again and again in this book to Chen Qide's memoir of the price disaster of the early 1640s. To close this introductory chapter, I would like to comment on a curious detail that might help to bring us close to the world this book examines. Chen Qide's second essay is dated to the fifteenth day of the eighth lunar month, the Mid-Autumn Festival. One of the most important festivals of the Asian year, the Mid-Autumn Festival was when families and friends got together to celebrate the harvest. In the late Ming, farmers had a saying: "If the Autumn Equinox precedes the Mid-Autumn Festival, a peck of rice will trade for a peck of coppers. If the Autumn Equinox follows the Mid-Autumn Festival, a peck of rice will trade for a peck of beans."[56] The one price was extravagantly high, the other dismally low. The Mid-Autumn Festival is a lunar date, whereas the Autumn Equinox is a solar date, the day when the sun at noon stands directly above the equator before it starts to tilt away and push the Northern Hemisphere toward winter. What the saying did was enshroud the mystery of what price the harvest might bring within the mystery of how Heaven arranged the movements of the sun and moon. In fact, the equinox never precedes the full moon of the eighth month. It would be a miracle if it did, just as it would be a miracle if a farmer could sell his crop of rice for its weight in money instead of its weight in beans.

As it happens, when Chen signed his first essay in 1641, the two days were tantalizingly close to each other. That year, the equinox fell just three days after the full moon. In 1642, however, the Mid-Autumn Festival arrived one day earlier and the Autumn Equinox one day later, widening the gap by two days. Had a farmer in Tongxiang any rice to sell in 1641 or 1642, he could have sold it for its weight in copper coins, though only to the wealthy. For most people, it would have been a nominal price that no one could afford. China was sinking toward the Maunder Minimum. On this autumn equinox there was no harvest to celebrate and no crop to sell—which is now our task to understand.

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