An Anthropological and Mechanical Analysis of the Enigma of the Chinese Load-Bearing Spine: How Does the Frail Elderly Woman Bear a Heavy Burden?

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Abstract

This study presents an anthropological and mechanical analysis that unravels the mystery behind the resilience of the Chinese load-bearing spine, particularly in elderly individuals who seemingly defy physical limitations to carry heavy burdens. A case study of a frail elderly shoulder-bearer, who despite suffering from sudden lumbar spondylosis, was effectively treated without losing his capacity to bear loads or perform labor, serves as a focal point. This treatment success, along with associated images suggestive of humpback deformity, encapsulates the deep-rooted tradition of shoulder carrying in China, which has persisted for millennia. Historical literature and photographs, coupled with firsthand observations of contemporary shoulder-carrying practices, offer valuable insights into this traditional practice. However, a significant knowledge gap exists concerning the divergence between Eastern and Western traditions related to load-bearing, which, if not addressed promptly, may relegate this cultural aspect to the status of archaeological and intangible cultural heritage. The research underscores the urgency of preserving and promoting the unique cultural heritage of Chinese shoulder carrying. Not only does it contribute to national identity, but it also carries broader implications for spinal health on a global scale. By highlighting the importance of this cultural practice, the paper aims to foster greater recognition within the international scientific community of the significance of the Chinese

shoulder-carrying culture. Through a blend of social medicine, participant observation, and human bowstring mechanics anatomical system studies, this research bridges anthropology, biomechanics, and cultural studies. It provides a platform for understanding human adaptability and the influence of cultural factors on physical capabilities. Conclusion: This is a typical case of a traditional spine that has been affected by the Chinese shoulder-carrying culture, which still retains its load-bearing capacity even after suffering from lumbar spinal stenosis with intervertebral disc protrusion. Therefore, it is crucial to protect the Chinese load-bearing spine in the traditional Chinese shoulder-carrying culture, and the Chinese load-bearing method is an effective way to counteract spinal recoil and prevent spinal disorders. This approach is scientifically sound and offers numerous benefits.

An Anthropological and Mechanical Analysis of The Enigma of the Chinese Load-Bearing Spine: How Does the Frail Elderly Woman Bear a Heavy Burden? — A typical case of a shoulder-bearer who suffered from sudden lumbar spondylosis and was successfully treated conservatively without compromising his load-bearing ability and labor capacity, and several controversial photos linked to humpback deformity

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Keywords: Chinese Shoulder-carrying Culture, Chinese Load-bearing Spine, Lumbar Spinal Stenosis with Intervertebral Disc Protrusion, anthropological, mechanical analysis, human bowstring mechanics anatomical system, cultural studies, archaeological, intangible cultural heritage, Denis' three-column spinal theory, the Four-Column Spinal Theory.

1. Data and History

In October 2023, the author witnessed an elderly man bent over a 100kg boulder before walking up a hill with a partner carrying heavy items over his shoulder. The author decided to record the scene on video. Surprisingly, the old man was revealed to be 70 years old, had difficulty standing upright, and had limited spinal movement due to a spinal curvature deformity. Despite his medical condition, he was still able to carry weight.

The expression on his face evokes a photograph from my memory. Over a decade ago, a frail, elderly, hunchbacked woman bore a heavy load on her back and gazed into the distance. This image went viral online and was crowned one of

the top ten photos that touched China in 2005. The perceived tragedy was attributed to the archaic Chinese shoulder-carrying culture, which incited the nationalistic fervor of hundreds of millions of Chinese netizens, further undermining the culture's reputation and hastening its demise. The author views the heir to the Chinese shoulder-carrying tradition, who can still bear heavy loads despite her hunched spine, as a redeemable subject for study. How is she capable of supporting such a weight with her seemingly feeble frame? Why does China uphold the tradition that "carrying water and chopping wood is the Way"? Her actions resemble monastic practices, but is there more to it than meets the eye?

Upon inquiring about his medical history, the author learned that ten years ago, the old man experienced a sudden onset of lumbar pain without any apparent cause, accompanied by numbness in both lower limbs and an inability to walk. He was diagnosed with lumbar spinal stenosis and lumbar disc herniation at Taizhou Hospital in Zhejiang Province and recommended conservative treatment and bed rest. After six months, the old man's lumbar pain subsided, but he lost the ability to walk upright. He usually rode a tricycle for long distances. When he slept or reclined, his spine straightened out as he relaxed. Occasionally, he experienced chest and back pain upon lying down momentarily, but the pain dissipated after a short while. After his back pain subsided half a year later, the elderly man neglected to seek further medical consultation and treatment. Despite the potential risks, he continued to work in the field under heavy loads, disregarding the doctor's advice. He even claimed that he was capable of carrying up to one hundred kilograms of weight regularly. The author learned from him about the physical condition of the elderly people in the local village who could bear heavy loads, and that instances of hunched back deformity like his were uncommon, as it was typical to encounter healthy shoulder-carrying individuals.

The elderly man, named He, was born in 1953 and works as a local peasant on the outskirts of Linhai. He grew up immersed in the Chinese culture of shoulder-carrying. He joined the production team at a young age and could carry more than 200 kilograms on his shoulders. The old man often worked all day carrying 100 kilograms without any issues. In addition to farming, he also worked in a chemical factory pulling carts and was said to be able to pull a two-wheeled cart loaded with over 500 kilograms of goods. However, ten years ago, at the age of 60, he suddenly experienced low back pain with no apparent cause. Despite this setback, he continued to maintain his ability to carry heavy loads regularly and never experienced back pain again.

Physical Examination: spinal rigidity, forward flexion, limited movement, claudication, and normal muscle strength in all his limbs.

Ancillary Examination: After reviewing the patient's medical history, it was discovered that ten years ago, he had undergone an MRI of his lumbar spine at Taizhou Hospital. Additionally, three years ago, he had an upper abdominal CT scan for kidney stones which also revealed a portion of his lumbar spine morphology.

Imaging: This is his lumbar spine MR ten years ago.

Figure 1.1.

This is a Magnetic Resonance (MR) request form for a patient from a hospital in Zhejiang Province, containing details such as the patient's name, age, medical history, symptoms, and the site of examination. It should be noted that certain information within this form pertains to privacy and is subject to confidentiality. The application date for this MR request is November 13, 2013.

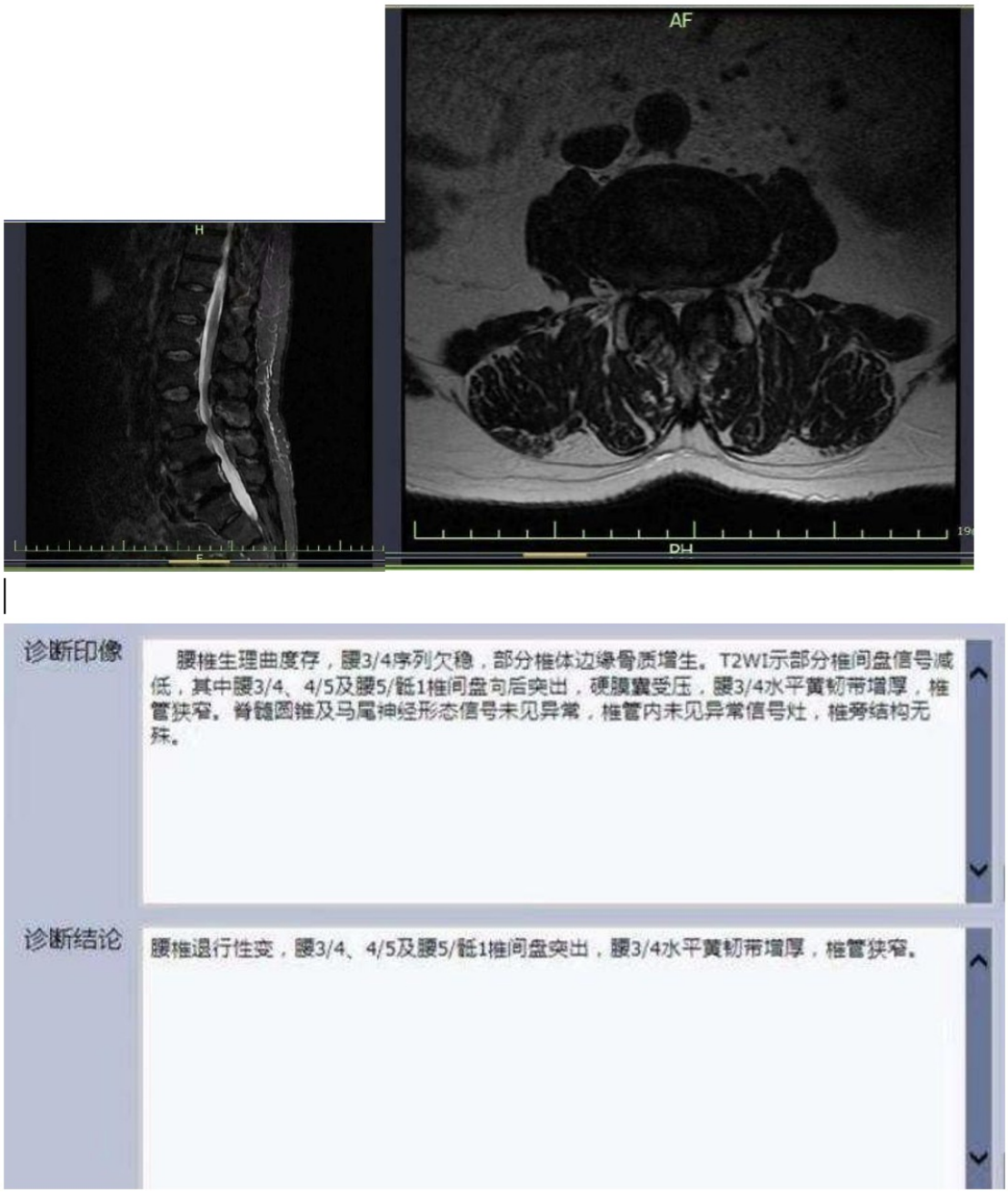

Figure 1.2. Study Date: November 25, 2013 Mr

Diagnostic Impression: It indicates the presence of the physiological curvature of the lumbar spine, with instability noted specifically at the L3/L4 segment; there is evidence of osteophytic changes along some vertebral margins. T2-weighted imaging (T2WI) revealed reduced signal intensity in several intervertebral discs, notably at L3/L4, L4/L5, and the L5/S1 levels, with posterior protrusion of these discs, resulting in compression of the dural sac, thickening of the ligamentum flavum at the L3/L4 level, and consequent spinal canal stenosis; the morphology of the spinal cord cones and the cauda equina appeared normal without any abnormal signal detection. No abnormal signal foci were observed within the spinal canal, and the paravertebral structures were unremarkable.

Diagnosis Result: Lumbar degenerative changes, lumbar disc herniation, thickening of ligamentum flavum, spinal canal stenosis.

Study date: November 25, 2013

Study Date: 29-Ju-2020. Three years ago, he had an upper abdominal CT scan for kidney stones, which also revealed a portion of his lumbar spine morphology.

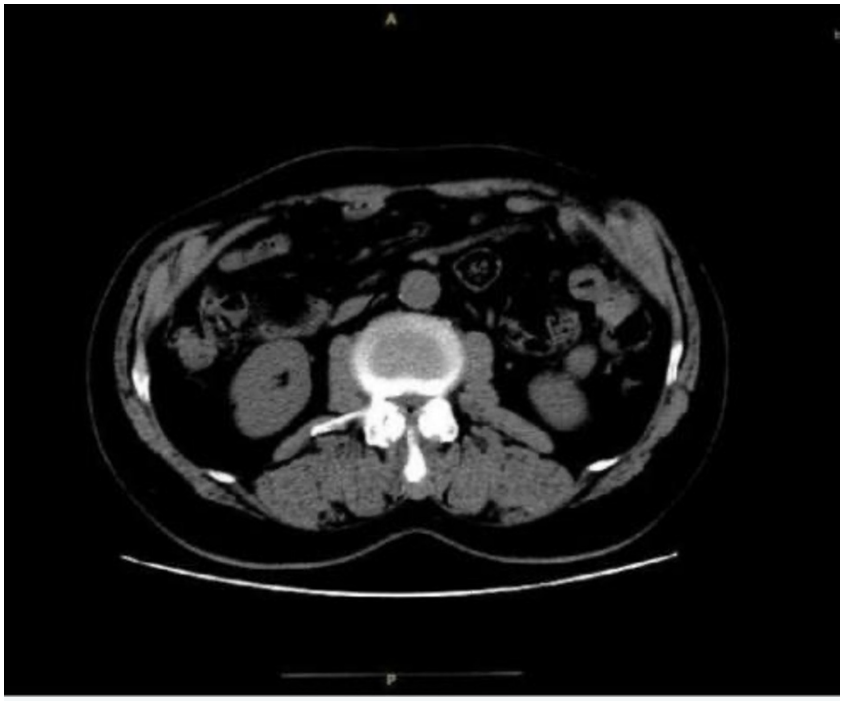

Figure 1.3.

The presence of lumbar spinal stenosis is evident in the lumbar spine CT seven years later.

Figure 1.4. A photo walking with a limp and standing, captured by the author (2023.10)

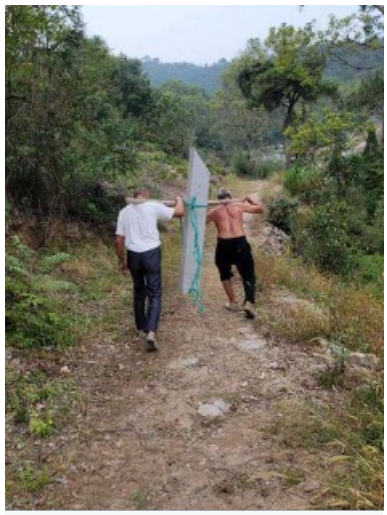

Figure 1.5. A photograph taken by the author, showing the patient carrying a 50-kilogram load up a rugged hill, and his companion, also carrying a load, did not experience any low back pain or spinal deformities (2023.10)

Figure 1.6. An ancient road winding up the mountain

It evokes the image of our ancestors, clad in straw sandals, ascending the steep slopes to gather firewood. They traversed treacherous mountain paths for miles, scaled peaks hundreds of meters high, and toiled to gather hundreds of grams of firewood. The strain on their feet and knees must have far exceeded that on their lower backs, which would logically be more prone to injury. Yet, they made these arduous journeys two or three times daily, day in and day out, until their dying breath. However, many who endured such hardships lived to a ripe old age, free from the afflictions of foot, knee, and back pain. Furthermore, those capable of bearing a weight of 100 kilograms were still deemed less strong. Isn't this something that worthy our reflection?

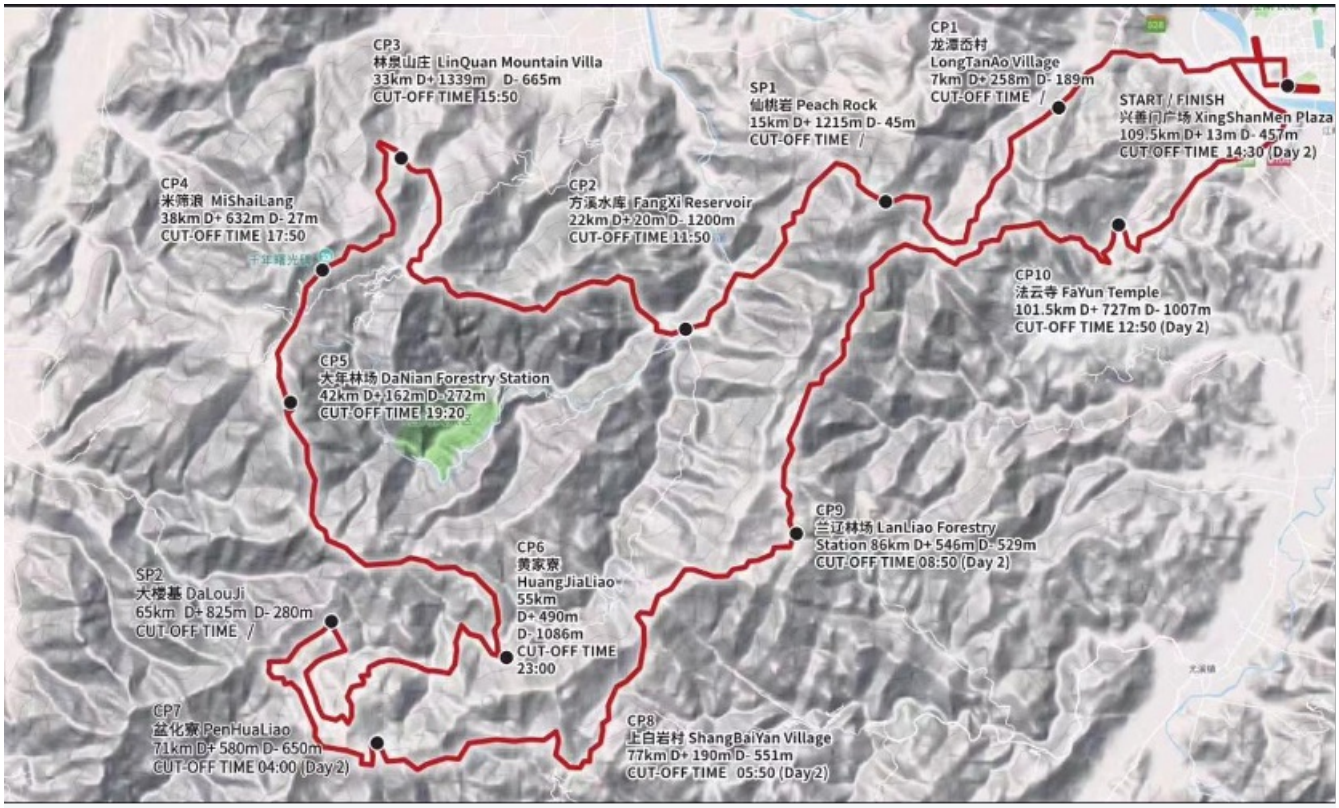

Figure 1.7.

The 100-kilometer Tsaigu Trail is an annual event hosted at Mount Kuocang in Linhai. The term “Tsaigu”, originating from the local dialect, signifies a race that is both fierce and arduous. Runners often jest that completing it feels akin to being beaten up, so it is jokingly called “the place where bones are broken” by runners. The Tsaigu Trail boasts a distinctive, unspoiled dirt path, meticulously preserved within its primitive ecosystem. Centuries ago, the region was sprinkled with quaint villages, and the trail network was intricately woven with many smuggling passes. One can imagine how tough the ancestors were at that time! With straw shoes, they would carry cold rice balls, quench their thirst from mountain pits, shoulder heavy loads, and traverse hundred-kilometer stretches of roller-coaster-like mountain roads. They toiled tirelessly day and night, finding rest in the wind without ever succumbing to weariness.

Treatment: The patient was instructed to rest in a hard bed for six months while taking oral medications to improve blood circulation and remove blood clots. After experiencing pain relief, the patient stopped taking any medication.

Results: Despite suffering from anterior spinal flexion deformity and limited mobility, the patient was able to live independently. Over time, his spine gradually returned to its natural straightness while he slept. Currently, the patient is still capable of carrying up to 50 kilograms of weight and working in the field.

Another case: At the physical examination center, the author came across an intriguing case while communicating with a descendant of the traditional Chinese shoulder-carrying worker. The patient had sustained injuries in his youth from continuously shouldering heavy loads. Recognizing its significant relevance to his research, the author inquired about his medical history. The patient had experienced a recurrence of lower back pain nine years prior without any clear cause and

was subsequently diagnosed with lumbar disc herniation at the hospital. However, his condition resolved spontaneously after one year of conservative treatment.

The patient was born in October 1951, male, 73 years old, a native of Linhai, Zhejiang Province. Instilled with the traditional Chinese shoulder-carrying culture from a young age, he was educated and trained to engage in productive labor early on. At just 18, he ascended the mountains to chop firewood, shouldering a hefty 60 kilograms. Tragically, a slip led to his fall, causing injury while in a flexed spinal position. He suffered significant lower back pain at the time but refrained from informing his family, nor did he seek hospital treatment or medication. After the injury, he continued to experience intermittent lower back pain, though it was tolerable. He returned home, shouldered 60 kilograms, and persisted with his work, yet the strain on his shoulders did not have a significant impact. After two years, his nagging lower back pain vanished on its own. According to his recollection, he wore straw sandals in his youth to climb 600 meters up the mountain and trekked 10 kilometers; often, he bore 60 kilograms of firewood on his shoulders for a 20-kilometer journey to the city to sell. At age 30, he was recruited to work in a school, which relieved him from the strenuous shoulder labor, yet his carrying capacity remained intact without experiencing any lower back pain. In March 2015, he suddenly developed intense lower back pain one day and went to the hospital, where he was diagnosed with a herniated lumbar disc. The doctor suggested conservative therapy. A year later, his discomfort had alleviated spontaneously, and he has been free from flare-ups since. After retirement, he continues to labor in the fields, reportedly maintaining the strength to shoulder 40 kilograms.

Examination: Poor lumbar mobility and limited movement.

Auxiliary Examination:

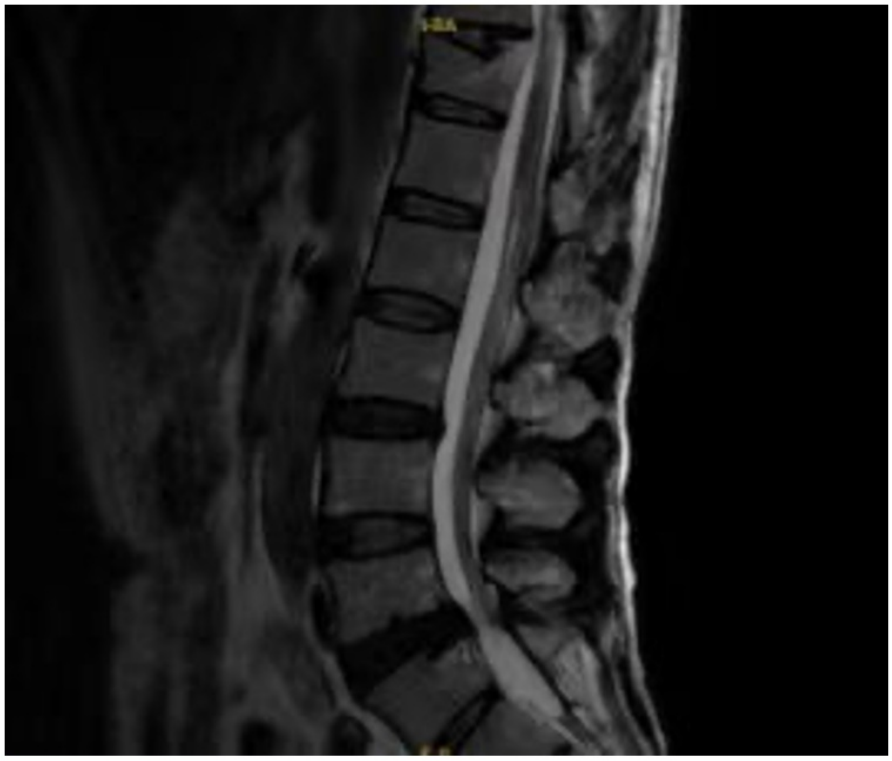

Figure 1.8.

The magnetic resonance imaging (MRI) results of the March 2015 results of the lumbar spine from March 2015 revealed a straightening of the normal curvature of the lumbar spine, along with the presence of osteophytes at the edges of certain vertebrae. The T2-weighted images (T2WI) indicated a reduced signal in the L3-S1 intervertebral discs, with the L5-S1 intervertebral disc exhibiting posterior protrusion, extending about 0.5 cm beyond the posterior margin of the vertebral

body. There was also a bulging observed in the L3-L5 intervertebral discs, which resulted in compression of the corresponding dural sac. The appearance of the remaining discs did not show any abnormalities. The spinal cord cones and cauda equina displayed no abnormal signal patterns, and no abnormal signal foci were observed within the spinal canal. No differences were noted in the paraspinal structures.

In summary:

1. Degeneration of the L5-S1 intervertebral disc with posterior herniation; degeneration and bulging of the L3-L5 intervertebral discs.
2. Presence of lumbar spine osteophytes.

Attachment: Mild wedge-shaped deformity of the T12 vertebral body with evidence of Schmorl's nodes.

Figure 1.9.

This is how the patient stands.

It can be inferred that despite sustaining a compression fracture of the T12 vertebra at the age of 18 following a fall on his shoulder, the patient persisted in engaging in labor involving shoulder-carrying activities post-injury and potentially continued to work up until his senior years.

2. Accompanied by some interesting pictures and videos to show Evidence of the Chinese Load-Bearing Spine in the Traditional Chinese Shoulder-carrying Culture

Figure 2.1.

This photo is one of the moving representations of China that circulated widely on the internet many years ago. It's often used to impart wisdom to future generations, conveying the message that life is never easy for anyone. Take a look at the picture below: it shows an elderly woman, with her frail body, pressing on against all odds in order to survive. If you can't grasp her determination, what excuse do you have for not persevering? Despite claims by some that traditional Chinese culture lacks pride, this original photo tells a different story. It illustrates how the elderly lady, in order to earn a living, carries the weighty load on her back with her powerless body because she also has to care for her little granddaughter, who is under five years old (her parents left due to illnesses they could not afford to treat).

Figure 2.2(a).

Figure 2.2(b).

Figure 2.2(c).

Figure 2.2(d).

Figure 2.2(e).

Figure 2.2(f).

These photos were captured by the author over the past seven years as part of a comprehensive study into the shoulder-carrying practice. Supplementing his visual documentation, the author has also carried out on-street interviews and survey research. The individuals involved in the study are primarily aged over 65. Generally speaking, they maintain good health, and while some may experience back pain, it typically resolves after a brief period of rest. Suffering from lumbar muscle strains and back pain would render it impossible for them to engage in heavy-load work, which is common sense, superseding the need for instrumental testing.

Figure 2.3. Three generations of Chinese stand together with clear-cut

At the medical examination center, three generations stand together, telling a clear result: the elderly exhibit the best health, followed by the middle-aged, while the younger generation fares the worst. This observation has become common sense in China, yet it remains unsupported by empirical data and statistical evidence.

Figure 2.4.

The traditional Chinese chair is a right-angle chair, which has been replaced by a self-described modern ergonomic chair:

the three arrow parts have been changed, representing the three parts of modern people, neck, waist, and knee joint, which represent the change of modern people's structure and center of gravity, the backward movement of the neck causes cervical spondylosis, the pressure on the waist causes lumbar spine disease, and the knee joint hyperextension. The neck and waist form a seesaw and a lever principle. Research has found that this so-called ergonomic chair is precisely the device that turns the Chinese spine into an S-shape.

This is a traditional Chinese chair.

Figure 2.5.

Two very interesting pictures and videos on TikTok

2.5.1.

Some suggest that the earth above the ancient city gate should be removed to reduce its weight and prevent collapse.

2.5.2.

Notice the great physical strength of a 90-year-old man.

2.5.3.

The author shares his predictions on Douyin.

The backbone of our younger generation has shifted towards the standard Westernized posture. It is only when they reach adulthood that they will come to understand the limitations this imposes, such as an inability to engage in manual labor and a higher risk of developing lumbar spondylosis. However, by then, it may be too late to take further action.

Figure 2.5.4.

The author advocates for health through Douyin, hoping to attract national attention.

Almost all the patients have slender, drooping, and slightly bent waists. A lack of physical strength in the waist can lead to a weakened lumbar spine structure. As a result, there is still much work to be done in terms of preventing and treating lumbar spondylosis in China.

Figure 2.6.

This sentiment echoes Oscar Wilde's lines, "We are all in the gutter, but some of us are looking at the stars." Those who

gaze upon the stars harbor dreams and hopes that burn brightly within their hearts.

On June 20, 2010, photographer Xu Kangping captured a picture at Chaotianmen Dock in Chongqing: Ran Guanghui, shirtless and with a cigarette between his lips, was balancing a heavy load on his shoulder while holding his son Ran Junchao's hand. This photo inadvertently became a national sensation at the time, touching the hearts of many. Dubbed the "Bangbangjun" or porter, Ran's rugged appearance belied the tenderness of the moment, which coincidentally occurred on Father's Day. Many people say, "A man bears the weight of his family on his shoulders, his self-reliance is symbolized by the cigarette, and his grasp signifies his future." [1]

Figure 2.7.

"From Fish to Humans"! Our scientists have confirmed that humans evolved from fish.

On September 28, 2022, *Nature* featured four scholarly articles by Academician Zhu Min's team as cover stories. These groundbreaking studies offer conclusive evidence for the emergence and initial rapid diversification of maxillipeds, rewriting the evolutionary history of "From fish to humans". The findings imply that human bones possess an inherent resilience to heavy loads, a trait adapted from our aquatic evolutionary past, where water pressure was a constant in our ancient environment. This shift is akin to transitioning from life on the plains to high-altitude terrains, or from Earth to the Moon.

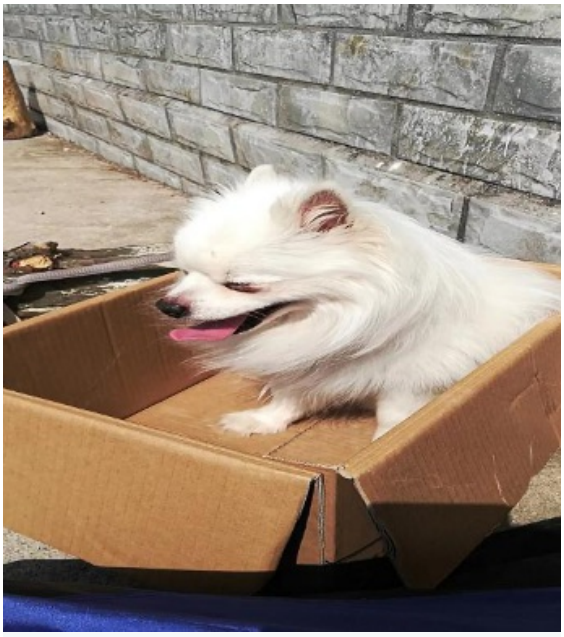

Figure 2.8.

The author had a dog, called the Japanese Silver Fox, who was the subject of his frequent observations and studies. Unfortunately, the dog passed away at the age of ten due to illness.

Figure 2.9. Chinese laborers participating in the construction of the Western American railway

This photo

In the American West in the 1860s, it was a Chinese man wearing a bamboo hat and carrying a load

Figure 2.10.

Zhan Tianyou is our country's outstanding patriotic engineer. The section of railway from Beijing to Zhangjiakou was first built under his auspices. This is the first railway line completely designed and constructed by Chinese engineers and technicians.

“Bearing the bloodline of the Yellow Emperor's descendants and a fervent zeal for knowledge, he melted the dangerous cliffs, perilous peaks, and sheer walls with his red flame of burning scholarship. He conquered the prejudices of men and the prophecies of spirits. Despite the contempt and mockery from all quarters, he forged a steely path up the trembling wild mountains, winning a true relief for his weary and humiliated motherland.” (*In Memory of Zhan Tianyou* by Liu Zaifu)

Figure 2.11.

The mural in the pyramid depicts a "giant" carrying two elephants on his shoulders! (Photo source online)

Figure 2.12.

This is a half-built stone arch bridge that is still standing after hundreds of years. (Baiyun Mountain, Linhai, Zhejiang, China)

3. Background

We foresee the future based on the past and the present. Only by examining the subsequent generation that matures in a non-shoulder-carrying cultural context—approximately 40 years following the cessation of China's shoulder-carrying tradition—can we employ rigorous research methodologies to compare the shoulder-carrying and non-shoulder-carrying generations. Such comparative analysis will yield results that are evident. In his address at the 2023 Annual Health Management Conference in Zhejiang Province, Professor Guo Qing, a leading expert in public health and prevention, highlighted that while the COVID-19 pandemic continues to pose challenges, Chinese society is also confronted with a surge in chronic diseases and an aging population. He noted that just four decades ago, China did not have a high prevalence of chronic illnesses such as cancer, heart disease, diabetes, fatty liver, and mental disorders, yet these chronic diseases have now become a significant cause of death among Chinese citizens, resulting in a surge in healthcare services' workload. Furthermore, the number of people aged 60 and above is continually increasing, currently exceeding 19%, and is expected to surpass 30% in the future. The ongoing pandemic, the control of chronic diseases, and the trend of an aging population have become the pressing health issues to be addressed in China.

Over the past century, mankind has experienced a rapid acceleration in the pace of change in lifestyle and movement. The traditional upright posture has evolved into a sedentary-standing way of working and living, with a focus on Western sports. However, in just a few decades, people in developed countries and regions (even those in developing countries) have become accustomed to using cars instead of walking, machines instead of manual labor, and automobiles instead of human movement for sitting-standing survival, life, and work. This Western style of sports is rapidly spreading worldwide, reducing the intensity of labor but also significantly diminishing the time and space for upright walking and carrying heavy loads. As a result, the body, particularly the spine, has developed new biomechanical maladaptations. In daily life, learning, work, and exercise activities, compared to the ancient habit of carrying heavy loads on the shoulders, the modern spine is more susceptible to injury due to frequent use.

Looking back at the 5,000 years before the reform and opening up, we can all recall that the daily work and life of the vast majority of Chinese people was characterized by arduous labor, such as trekking across mountains and rivers, tilling fields, chopping firewood, and carrying heavy loads. Since childhood, Chinese people have been learning to bear the weight, gradually increasing the load on their backs and strengthening their shoulders. As adults, they were able to carry loads up to a hundred grams until their last breath. Whether it was fetching food from the fields, purchasing goods from the market, hunting in the forest, or fetching firewood and water for daily life, the shoulder pole was an integral part of the Chinese people's lives. The shoulders, the shoulder pole, and the traditional spine form the backbone and soul of the Chinese culture of carrying loads on the shoulder. Carol Ward, an anthropologist at the University of Missouri-Columbia, said, "The spine was originally a vault (beam), and once upright, it had to act as a load-bearing column." From a "beam" to a "column", its mechanical state has naturally changed greatly, and its stability is also insufficient. However, the Chinese shoulder-carrying culture is precisely designed to compensate for this lack of stability. The Chinese load-bearing spine in the traditional Chinese shoulder-carrying culture has been well protected. [2] [3] The traditional Chinese spine has the function of a column and beam, and the structure is special.

In the realm of Buddhism, particularly within Zen practice, the act of shoulder-carrying is transmuted into a form of spiritual nourishment. This profound transformation cannot be perceived without a deep dive into Chinese Buddhism, especially Zen. Commonly, society views agriculture as a basic industry that ensures our basic needs of food and clothing. However, to the individual, especially in ancient China, farming was seen as a menial, arduous task that depleted one's physical strength. For instance, growing up in a rural background, I often accompanied my father in agricultural labor during my youth. Those experiences left me with nothing but fatigue and discomfort, devoid of any semblance of humanity. Yet, as time went by and I embarked on a study of Buddhism, I uncovered a fundamental principle within Zen: if an activity that induces pain is embraced as a form of Buddhist practice, it instantly becomes a virtuous deed that elevates life. This echoes the philosophy of "Carrying water and chopping wood is the Way", and the belief that "With the right mindset, one can become a Buddha right away." [4] The author holds the view that not only is carrying water and chopping wood the Way, but it also fortifies the body and spine.

After the reform and opening up, the mindset of the Chinese people changed. On DXY (https://www.dxy.cn/), a platform that hosts millions of Chinese medical professionals, the author penned an article titled "In search of Dr. Hu, a spine surgeon from Nanjing, on DXY. I hope he may read my paper and offer any necessary corrections." Discussions about China's shoulder-carrying culture emerged on this platform, prompting a response from a DXY scholar (2014.1.31) [5]: "Shoulder-carrying isn't a cultural practice; it was a necessity dictated by living conditions. If one had a wheelbarrow or a cart (unaffordable luxuries at the time), who would choose to bear the load on their shoulders? This, coupled with the fact that mountain roads went unpaved, leaving no alternative but to carry burdens, makes it hard for me to see how this could be glorified as a cultural aspect of life for the lower classes. My own childhood was spent laboriously hauling water for our food, which led to uneven shoulder development. My shoulders have been worn down many times over. Suffering is suffering (and if water had been readily available in the mountains, who would have chosen to toil so?)." Coal was transported by horses, and individuals risked exhaustion and even death if they attempted to carry it. Please stop hailing the hardships of the lower classes as a cultural phenomenon. Those days are already gone. Nowadays, as life improves, we face more diseases. The majority of these diseases are the result of our living and eating habits, so let's not label everything as culture. Only those who live at the grassroots level truly understand that it's not culture, but a reflection of the society and era we live in. Just like the Chongqing *Bangbangjun* and the Guizhou Backpackers, this is merely a lifestyle for the lower class to survive. Their spirit deserves recognition, but branding them as cultural icons is actually a subtle insult."

Excerpts from online opinions, representing China's current mainstream understanding of Chinese shoulder-carrying culture

1. From this perspective, it is not a sign of human degeneration, but rather an indication of progress. Thanks to progress, people no longer need to engage in strenuous physical labor. The 1980s marked a significant turning point in human history, serving as a clear watershed moment. Since then, with the rise of non-physical jobs, individuals have shifted away from solely relying on physical exertion for agricultural work. Mechanical products have not only increased farmland output by several or even dozens of times but also significantly reduced the burden on farmers. As these

high technologies continue to impact our lives, physical labor has become less prevalent, and there is no longer a need to push one's physical limits [6].

2. “We are all forced out!” Push out your potential.
3. In the past, many Chinese people were engaged in manual labor. Under the influence of such work, a young man in his 20s could easily carry a load of around 200 kilograms. The older generation used to say, "Children from poorer families learn the value of hard work early on." Back then, children had to start doing farm work at a very young age. Due to their lack of strength, they would do simple tasks such as fetching water, chopping wood, and gathering firewood. Through these exercises at a young age, their physical fitness was constantly developed and strengthened, resulting in increased strength over time. This is similar to weightlifters who have good natural physical qualities and continue to exercise for many years, leading to a continuous increase in strength. Today, with improved living conditions, many elderly people often joke that people are now "lazy". Forty years ago, there were individuals in every village who possessed the strength of Hercules and could carry 150 kilograms on their shoulders. However, such individuals are no longer common today. Nowadays, many young people in rural areas do not engage in much laboring work. If they labor at home, such as carrying water or objects, they cannot endure it for long and will experience soreness in their backs, legs, and even bones throughout their bodies the following day. In their opinion, it is almost impossible to carry more than 150 kilograms of weight. Why? The answer came. Just as an old peasant said, “We are all forced out!” [7]

The ancestors of the shoulder-carrying people toiled with their backs towards the sky and their faces towards the earth. The culture of shoulder-carrying has been passed down from generation to generation. In the past, they were considered poor and lower-middle peasants, also known as mud-legged people who carried hoes. They worked tirelessly, regardless of weather conditions. In ancient times, among scholars, peasants, workers, and merchants, the status of peasants was higher than that of workers and merchants. Peasants mainly worked in fields carrying heavy loads and were trained from a young age. By adulthood, they had developed the ability to carry over 100 kilograms and continued to do so until the end of their lives. If they had worked well when they were young and had not injured their backs, they would not have suffered from lumbar spondylosis throughout their lives. As the adage goes, if a person works hard and maintains good spinal health from a young age, they are less likely to experience back pain in the future; their ability to carry weight remains intact throughout their lifetime. Even in cases of lumbar injury, only the shape of the spine may be altered after proper conservative treatment, resulting in a condition known as hunchback. Despite the negative image associated with hunchbacks, their weight-bearing functions were fully restored, their strength was not diminished, and their ability to work remained unaffected. The peasants were often referred to as the generation of deep hardship, as depicted in China's online video work "Erjiu". [8] In China, they were considered physically disabled rather than mentally disabled. Currently, mainstream culture collectively refers to these works as glorifying suffering. However, on the opposite end of the spectrum, there is a significant number of individuals with all their limbs who are unable to perform manual labor and suffer from underlying illnesses such as obesity and high blood pressure. This generation is frequently ill and grew up under their parents' care. Some earn money through mental labor and travel by car, without any physical labor capacity. This generation is far less physically fit than their predecessors due to a sedentary lifestyle, unhealthy eating habits, and lack of physical labor. However, the root causes have not been thoroughly examined. The author has been tasked with

quantifying and presenting sufficient data, collecting more case studies and pathologies, and conducting systematic research and summaries for a more convincing argument based on data. Unfortunately, over the past six years, collecting data has proven challenging as elderly shoulder-carrying individuals are aging and becoming increasingly rare, with most being over 65 years old. They tend to avoid hospitals unless they experience back symptoms. As a result, the author has struggled to obtain clinical data and imaging evidence.

Human evolution has been relatively slow since the beginning, transitioning from crawling to standing and changing the spine from the bow-shape to the S-shape. However, the longitudinal axis of the S-shape has always remained in a forward-bowed position, known as the bow-shaped exercise. Influenced by Western sports that emphasize strengthening the body through toxic chicken soup, modern exercise methods are incorrect, with reverse bow exercises completely breaking the spine. Despite facing injuries, people still believe it is the right exercise and continue to practice it. The increase in athletic ability brought about by medicine and technology is only temporary, and ultimately, these advancements will be defeated by further medical and technological progress. There is no way to correct or cover up the injuries caused by incorrect, self-inflicted forms of exercise. In particular, the health crisis caused by the youthfulness and prevalence of cervical and lumbar spondylosis worldwide, and the inability of medicine and technology to do anything about it, will lift the veil of false, pseudo-scientific exercise. The author believes that some ancient wisdom is progressive, even in modern times. The Chinese shoulder-carrying culture, respect for nature, and the concept of harmonious coexistence between humans and nature are worth reflecting upon and can provide valuable resources for future generations.

For the past six years, the author has been actively engaged in outdoor exercise to discover the most effective way to stay fit. As a result of his profession, he encounters a lot of patients, frequently observes the health status of older generations who engage in shoulder-carrying exercises and compares them with the younger generation who do not. He also compares Chinese shoulder-carrying exercises with Western sports. The findings indicate that shoulder-carrying exercises are beneficial for one's health, while Western sports may not necessarily provide the desired level of fitness. The ancient God rewards the diligent, refers to in line with the law of nature, the right direction, the clear goal, the right road, the correct method, and desperately hard work, in order to succeed, failure will not bring damage.

If we overlook factors such as diet and genetics, the similarity between Chinese and Japanese centenarians is that they engage in manual labor rather than exercise, work hard and obey rules when young, and continue working even in old age. It is a common misconception that the older generation has a short life expectancy and that modern long-lived individuals are simply carrying on the legacy of their ancestors. However, those who have lived traditional lifestyles combined with modern technology have achieved longevity. The long lives of previous generations have contributed to the overall increase in life expectancy in contemporary society. The youngest members of modern society, who have grown up in an era of advanced technology and have distanced themselves from traditional ways of life, are only 44 years old and have not yet been tested by time. Sadly, many modern individuals have died at a young age. If we were to calculate the average age of those born post-1950s, -1960s, and -1970s separately, it would likely be less than 70. As for those born post-1980s to post-2020s, their average life expectancy may be even lower. It is crucial for modern young people to

understand that they cannot assume they will live long lives in the future. Contemporary long-lived elderly individuals in China and Japan serve as examples of healthy living and sound an alarm for our society. To achieve sustainable development in the modern world, it is essential to study traditional culture and lifestyle while also developing technology. Besides, we should not eliminate or deny traditional ways of life but instead strive to integrate them into our modern society.

4. Discussions

The participant observation method originated from fieldwork, and British anthropologist Bronislaw Malinowski was the first researcher to live with the research object for a long time and record the whole process of data collection, which established the status of the participant observation method in the academic field. Participant observation means that the researcher participates in the daily activities of the research object and obtains more real data through direct senses and experiences from the third perspective in its work, life, and various interactions with the outside world. The participant observation method is especially suitable for studying the social and cultural background of human life, studying the development process of events, the relationship and combination between people and events, and the time continuity and pattern of events from the perspective of insiders rather than outsiders. Participant observation is an important part of case study and qualitative research, as well as an important method of social investigation and research.

To better understand the various factors contributing to this condition, as well as the pros and cons of the Eastern and Western spine, the author employed the field research method to conduct participant observation and field investigations. By establishing the Physical Examination Center, the Shoulder-carrying Laboratory in Jingjiang Mountain Park in Linhai, and the outdoor area as focal points for our investigations, we can work collaboratively with participants to conduct in-depth interviews.

The Chinese load-bearing spine was first discovered, leaving people with the impression that many hunchbacked elders can still carry heavy loads despite their spinal deformities. I am curious to know if they experience any lower back pain. It's not as if they all suffer from spondylosis. It seems that the construction of the pyramids was filled with the sounds of overseers' whips and slaves' groans. However, ancient Egyptian construction workers were highly specialized and well-treated, contrary to popular belief. The idea that the Egyptian pyramids were built by slaves has been debunked from architectural, historical, and archaeological perspectives. As one of the masterpieces of ancient architecture, the Egyptian pyramids were built in a mysterious and grandiose manner, but we cannot base this wonderful historical and cultural heritage on a sinful image of slave labor. Miracles cannot be expected under excessive guidance, strict supervision, and coercion. The only way to optimize human capacity is through harmony between the body and mind [9]. Many shippers carry a hundred pounds, walk a hundred miles, and continue until they die of old age. In the picture, shoulder-carrying passers-by are only capable if they have been exercising since childhood and possess a special physique. It is essential to reacquaint ourselves with the true value and significance of this masterpiece based on real historical facts, as a tribute to the wisdom and diligence of the ancient Egyptians. The same can be true of the long-lasting Chinese shoulder-carrying culture.

4.1.

Degenerative lumbar spinal stenosis (DLSS) has emerged as a prevalent orthopedic condition, particularly among the aging population. This condition significantly impacts the quality of life and overall well-being of middle-aged and elderly individuals. Despite its prevalence, there remains controversy on the diagnosis and treatment of DLSS. Degenerative lumbar spinal stenosis (DLSS) is a clinical condition characterized by the narrowing of the spinal canal, lateral foramina, and neural foraminal spaces due to degenerative changes. This results in compression of the lumbar nerve roots, compromised blood flow, and the development of neurogenic claudication or pain in the lower extremities. Imaging studies have shown that 14% of asymptomatic individuals may have lumbar spinal stenosis. The mere presence of imaging-detected stenosis is referred to as "spinal stenosis," but it becomes clinically significant when accompanied by definite symptoms. Anatomical causes of lumbar spinal stenosis, such as disc herniation, instability, spondylolisthesis, or scoliosis, have their own unique features and can be considered concomitant diagnoses when combined with DLSS. The diameter of the spinal canal varies depending on posture and motion: When the body is upright or hyperextended, the lumbar spine exhibits a natural or excessive anterior curvature, resulting in a relatively narrow canal; conversely, when the body is flexed, the anterior curvature of the spine is neutralized, and the ligamentum flavum becomes taut, thereby widening the canal. This explains why patients with DLSS often adopt a flexed position to alleviate their symptoms [10].

Typical heir to the Chinese shoulder-carrying culture. The traditional spine influenced by the Chinese shoulder-carrying culture has a miraculous ability to recover its function [**11]**. Over the past six years, the author has gathered numerous videos and photographs of this spine-like wonder during outdoor exercises in rural areas. The author, born after 1970, witnessed this phenomenon as a child, which sparked deep thinking. In China, people with shoulder-carrying abilities are becoming increasingly rare, usually those over the age of 65. Because of long-term hard labor, their spines deteriorate rapidly in old age, yet their working ability, especially shoulder-carrying capacity has not been lost. Even if there is little opportunity for heavy labor, the younger generation also faces the problem of rapid spinal degeneration. This problem has not been overlooked and neglected. As a result, the authors conducted an extensive investigation to address this concern. T his is a typical case of a shoulder-bearer who suffered from sudden lumbar spondylosis and was successfully treated conservatively without compromising his load-bearing ability and labour capacity

The tightness or looseness of the ligamentum flavum may also be a distinguishing factor between traditional Chinese and Western spines. Let's compare their advantages and disadvantages. Due to long-term shoulder-carrying labor, the traditional Chinese spine is fixed in a mildly flexed position on the anterior side, which gives it a bad appearance and makes it look like a hunchback. However, this allows the ligamentum flavum to remain in a state of mild tension, resulting in a larger spinal canal. The traditional spine also emphasizes stability. When the spine is lightly flexed forward, along with internal adduction of abdominal muscles, it creates an air ball in the thoracic and abdominal cavities, which forms the *qi* fetus principle when weight is carried on the shoulders. This is known in traditional Chinese medicine as*yin* embracing *yang*, with *Ming Men* (the Gate of Vitality) protruding, (the part behind lumbar vertebrae 2 and 3 is called the Gate of Vitality; one inch below the navel in front is called *Dan Tian*, or the cinnabar field, and there is the sea of*qi*), making the spine more stable. The ancients believed that when force is used, the waist should extend outwards. When describing

someone with great strength, we might say they are strong as a bear in the hips and have a back as flexible as a tiger's. This is the main reason why people who carry loads on their shoulders have a lower incidence of lumbar spondylosis.

Life gate, life gate, life gate—when a person stands straight, there is an anti-arch effect: the body bends back, and the weight of the whole body bends back at this point. This is the body's anti-arch point, the reverse bend point. You can try to push forward with your hands and feel the force and the reaction force; you can feel that the reaction force and the weight of the upper body are acting on the point anciently called the life gate. Take chopsticks as an example: when we slowly press the chopsticks lengthwise, the chopsticks bend and break, which is a breakthrough at the most vulnerable point of the life gate; just like an open door, the life gate is opened, and disease will invade. Taiji calls for the *qi* to sink and hold the life gate.

During the physical examination work at a medical center, the author observed that many individuals in modern times have a slender, drooping, and slightly bent waist. This type of waist is considered deformed by ancient standards. In traditional Chinese medicine, a "powerless" and "incompetent" waist is one that lacks the proper balance of *yin* and *yang*, with the Gate of Vitality concave inward and the belly tilted forward. Such a waist is unable to support heavy loads carried on the shoulders. However, many modern people pursue this type of physique as a sign of beauty. Interestingly, this type of spine is referred to as the "standard spine" by Western medicine.

For many years, the author was puzzled by the difference in spine structure between the spines of shoulder-carrying and non-shoulder-carrying people. After examining the lumbar spines of 100,000 individuals aged 1 to 100, he compared the two groups and discovered that modern people's problematic posture is related to the global prevalence of cervical and lumbar diseases [12]. This chronic condition causes the upper body weight to fall into the inner recesses of the lumbar vertebrae, creating a lever effect and pulling on the abdominal muscles. This also leads to a cervical deformity, with the neck and upper back in a buckled, distant position. The thoracic spine moves backward, forming a mass at the junction of the cervical and thoracic spine, known medically as Upper-crossed Syndrome (UCS), also referred to as proximal or shoulder girdle crossed syndrome. Its main symptoms include rounded shoulders, hunchback, a forward-extended head, and winged shoulders. If many people go to the hospital for an X-ray in the early stages of lumbago, Western doctors may consider this type of spine to be standard. During the physical examination work at a medical center, the author observed that many individuals in modern times have a slender, drooping, and slightly bent waist. This type of waist is considered deformed by ancient standards. In traditional Chinese medicine, a "powerless" and "incompetent" waist is one that lacks the proper balance of yin and yang, with the Gate of Vitality concave inward and the belly tilted forward. Such a waist is unable to support heavy loads carried on the shoulders. However, many modern people pursue this type of physique as a sign of beauty. Interestingly, this type of spine is referred to as the "standard spine" by Western medicine. In fact, the Chinese load-bearing spine under the traditional Chinese shoulder-carrying culture has been damaged. Long-term bad positioning causes cervical and lumbar vertebral physiological curvatures to straighten. The change of cervical curvature and the curvature of the lumbar spine are affected. Amplified by the thoracic vertebral curvature, the seesaw effect on the cervical curvature evolved into a passive straightening, which is the most basic reason for cervical spondylosis [13].

4.2. What the animal dog can teach us

When a dog stands up, it is a reflexive movement of the spine, and the spine is bent. The lumbar spine has a point where the maximum force is applied, and this point is known as the Gate of Vitality. Dogs are animals that can help humans understand the importance of the Gate of Vitality. The author had a Japanese silver fox dog named "Ben Ben" for several years, who died due to illness a few months ago. The author has been studying dogs for some time, and when searching for information on lumbar spondylosis in dogs on Baidu, he found numerous relevant popular science articles. For example: 1. An article by Sunday Pets Pet Food titled "Can dogs get a lumbar disc herniation?" 2. An article by WePetMedic titled "A dog can also suffer from neck pain, lumbar pain, and lumbar disc herniation, which can lead to paralysis!" 3. An article by Dr. Wen titled "This daily behavior brings 'torture' to the dog’s lumbar vertebra. Do you also engage in these behaviors?" 4. An article by Orange titled "Can dogs develop lumbar spine diseases too?" These articles are insightful, engaging, and thought-provoking. The author discovered that dogs are also susceptible to lumbar spine disease, and the pathogenesis, preventive treatment, and rehabilitation methods for dogs surprisingly align with most of those for humans. It serves as a mirror to reveal the human archetype, providing warnings and insights for humans. However, humans tend to overlook this and fail to take it as a caution. Many cases of human lumbar spondylosis are a result of repeatedly engaging in the same misbehaviors as animals in nature, leading to the same condition. Therefore, the author has classified the misbehaviors as below: First, dogs tend to stand frequently. Second, their bodies are often too long. Third, some dogs are overfed, resulting in a sagging stomach and an overweight body. Fourth, spinal development deformities or spinal tumors can cause malnutrition in dogs. Fifth, many people like to hold the dog's armpits with both hands and lift it vertically, sometimes even shaking it vigorously, which can harm the spine. Sixth, due to their short legs, dogs are forced to walk with their chest out, resembling the downward-facing dog pose in yoga. Seventh, dogs frequently climb up and down stairs and jump from high places. Stairs pose a high risk for dogs due to their lumbar curvature, which can lead to lumbar disc herniation. Eighth, dogs are active and may suffer spinal fractures from trauma, which is a progressive process. By the time these issues are noticed, it may be too late. To care for a herniated lumbar disc, it is crucial to ensure that the spine is not further compromised. The best way to prevent lumbar spine disease is to start by walking your dog regularly. Avoid letting your dog stand or bow excessively throughout the day, and maintain a normal exercise frequency without overexerting them. Acute lumbar disc herniation often occurs in certain breeds prone to cartilage dystrophy between the ages of 3 and 6 years. Chronic herniated lumbar discs typically occur in large breeds around 8 to 10 years old. The fifth point is crucial. Both human and dog spines have the same fundamental principle of injury, which can cause significant damage. According to Chinese medicine, neglecting to protect the Gate of Vitality is equivalent to neglecting the load-bearing spine in Chinese medicine. The Gate of Vitality is located at the center of the spine and experiences directional forces. Once this area is damaged beyond repair, it becomes too late. It's similar to a tooth that has been shaken loose; even a skilled dentist may struggle to save it, and eventually, it will fall out. Dogs are humans' most loyal companions and valuable teachers. Their anatomy offers many aspects worth studying and learning from humans. Humans and dogs are interconnected by fate, with dogs being inseparable from humans, and vice versa. Therefore, humans should treat dogs well and prioritize protecting their arched spines.

4.3.

Recently, the academician team led by Zhu Min from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) at the Chinese Academy of Sciences (CAS) publicly affirmed that humans evolve from fish, a process that spanned nearly 500 million years. This lengthy evolutionary journey began with the earliest jawless fish evolving into jawed species, followed by the development of fleshy fins in fish, and subsequently transitioning onto land to become amphibians and mammals, ultimately culminating in humans [14]. Ancient people often referred to the white belly of fish as a sign; if a fish exposes its white belly, it is also a sign of impending death. A dead fish floating belly-up is usually due to a series of biochemical and physical changes in its internal tissues post-mortem.

Source from Baidu

Typically, a fish maintains its equilibrium through the use of several fin pairs, such as the pectoral, ventral, and caudal fins, while it uses its swim bladder to adjust the body's density, helping it stay at the desired depth. However, when on the brink of death, a fish loses the ability to control its muscles, and the swim bladder—commonly referred to as the fish bladder—often becomes inflated with gas. As a result, the fins can no longer perform their balancing role effectively. Consequently, due to the heavier back and lighter belly, the fish turns upside down underwater, exposing its white belly to the surface, leading to the belly-up appearance. After death, the swim bladder remains inflated with air, causing the fish to continue floating on the surface, belly up. It is worth noting that in some species, if the death struggle is brief, the swim bladder may not inflate in time, causing the fish to sink. Additionally, fish that have gone through a struggle typically rise to the surface with their bellies turned white, showing only their pectoral fins moving feebly.

Fish respire through their gills and navigate by synchronizing the movement of their body, tail, and fins. The majority of fish species possess swim bladders to regulate their buoyancy, enabling them to drift effortlessly in the water. So, what causes them to drown? This is related to the depth at which the fish descends.

As is widely known, the swim bladder serves as a buoyancy aid for fish, allowing them to control their ascending and descending by adjusting its volume. This organ acts as the fish's "life buoy" during swimming, expanding or contracting to modify the body's specific gravity. Moreover, fish are categorized into shallow and deep-water species, each with body structures adapted to the depths they inhabit. Consequently, fish need minimal muscular exertion to remain buoyant and stable at their preferred depth without sinking or surfacing. However, when a fish descends to a certain threshold depth—known as the "critical depth"—the immense external pressure prevents the swim bladder from shrinking further. At this point, the buoyancy force acting on the fish is outweighed by its own gravity, causing it to sink involuntarily to the ocean floor, unable to resurface, leading ultimately to drowning due to an inability to breathe. When a shallow-water fish dives too deeply, the surrounding water pressure increases significantly. Should the pressure reach a critical level, the swim bladder may fail; under such pressure, it diminishes in size, reducing the fish's buoyancy. Even though it could attempt to ascend by flapping its fins and tail, if it has sunk too deep, these efforts prove futile. At this stage, the fish falls into an abyssal darkness. The excessive water pressure can also impair the function of the fish's gills, similar to how humans experience altitude sickness, resulting in the fish drowning.

Deep-sea fish can live freely in deep water because their skeletal structures are fortified to endure immense pressure. If a

deep-sea fish is rapidly brought above its "critical depth," the internal pressure cannot be balanced with the reduced external pressure, causing it to "expand" incessantly until it buoys up to the water's surface. In extreme cases, this can lead to the fish vomiting out its organs and suffering a catastrophic "explosion" that results in death.

An ancient saying states, "The water that keeps a ship afloat can also upset it." It is often used as a metaphor for how something can either help or destroy a person. This seems to hold true for fish and water as well. While aquatic environments support fish life, excessive depths can hasten their demise. It appears that fish, inseparable from water, paradoxically fear it too. This illustrates a profound truth: everything has its limits. Without finding the right equilibrium, extinction may not be far off. Our ancestors observed this principle in human behavior, warning against overreaching with the saying, "To tilt one's stomach is a sign of rolling one's eyes" [15]. Five thousand years ago, Chinese individuals bore the weight of water pressure on their shoulders, symbolized by the practice of shoulder-carrying—an evolutionary echo from our aquatic forebears. Could the modern disappearance of such burdens, akin to deep-sea creatures emerging onto land, be linked to the surge in modern cases of spondylosis? If humans evolved from fish, our bones surely inherited the capacity to withstand pressures. Thus, we bear weights on land to maintain balance and structural integrity, much like our aquatic ancestors did in the vast oceanic expanses.

4.4. The Structure and Basic Mechanics of the Human Body: The Four-Column Spinal Theory, the Gate of Vitality and *Dan Tian*, and the Theory of *yin* and *yang*

The structure and basic mechanics of the human body: Denis' three-column spinal theory is considered the foundation of modern spine surgery. Initially designed for thoracolumbar fracture classification, it later contributed to the development of various aspects of pedicle screw systems, spinal stabilization, and even spinal orthopedics. The three-column theory proposed by Denis in 1983 has provided a basis for understanding spinal stability. The three columns include the anterior, middle, and posterior columns. The anterior column comprises the anterior longitudinal ligament, the anterior half of the vertebral body, and the anterior half of the annulus fibrosus. The middle column consists of the posterior longitudinal ligament, the posterior half of the vertebral body, and the posterior half of the annulus fibrosus. Finally, the posterior column includes the vertebral pedicle, ligamentum flavum, capsular ligament, and interspinous ligament. Spinal stability is dependent on the normalcy and balance of its three-column structure. The endogenous stability of the spine is supported by the vertebral bodies, intervertebral discs, small intervertebral joints, and ligamentous bands, while the exogenous stability is maintained by the tension of the muscles in the low back and abdomen, as well as by the pressure exerted by the thoracic and abdominal cavities. Spinal stability is essential for the proper functioning of the spine, and any trauma or strain that disrupts this stability can lead to low back pain and other clinical manifestations.

Denis’s research continues to be grounded in the Western standard spine, overlooking the existence of the Chinese load-bearing spine supported by *qi* columns. This concept acknowledges the fundamental difference between the spine and the vertical column. It elucidates the difference in the lengths of the anterior, middle, and posterior spinal columns, with the anterior being the shortest, followed by the middle, and the posterior being the longest. Additionally, spinal movement is directional, and motion in the opposite direction can lead to spinal damage. With the introduction of the *qi* column principle

by the author, the three-column spinal theory evolved into the four-column spinal theory, incorporating the shoulder-borne weights as integral to the body's structure. To maintain bodily stability, a certain amount of counterweight is necessary. The second and third lumbar vertebrae are often referred to as the Gate of Vitality; the back represents *yang*, while the abdomen signifies *yin*. In terms of the 400-meter runway, the difference between the inner and outer circles is 87 meters. The standard runway measures 400 meters long and features a semicircular curve.

The Chinese load-bearing spine is arch-shaped to support weight. The reason why an arch bridge can be used for pedestrians is due to its unique arch structure, which distributes pressure into a downward force and two horizontal forces (outward thrusts) towards the ends. When a heavy object is placed on the bridge, the resulting pressure is transferred to the ground at each end of the bridge. Similarly, when the shouldering spine carries a load, the weight compresses the spine, making it tighter, and generates downward and two horizontal forces that are transferred to the feet, creating a horizontal backward force that generates friction with the ground. The foot, forefoot, and ankle serve as the base of the arch bridge, while the Achilles tendon acts as a heel jack. The spine produces an upward extension force, commonly known as the separation of flesh and bone. At this point, the abdominal muscles contract inwardly, forming an air pocket that is utilized to create the theory of *qi* fetus. The arch design of the spine not only bears force but also has a specific movement mechanism that allows for sudden changes in direction when active, leading to the lever theory. This generates a greater upward force to offset the weight of the body and load, which is why it's often said that a small force can lead to a big payoff. The older generation has developed specific habits and ideas of life and activity with a political system, often involving carrying weights to maintain the arch-shaped structure of the spine. Over time, this shoulder-carrying culture has become an integral part of Chinese society. Denis' three-column spinal theory considers the spine as a standing column without the help of qi, but the author believes that the spine is an arch-shaped column and beam that forms an air pocket with the abdominal cavity, which can be utilized to form the principle of *qi* fetus. *qi* is also an important factor in maintaining the stability of the spine.

From the perspective of Chinese medicine, when treating the human body through acupuncture, we typically focus on tendon points. This method involves targeting these specific acupoints. Many people may wonder about the proper angle and depth of acupuncture insertion. To answer this question, it is important to first determine whether the treatment area is a skin point or a tendon point. The meridian tendon system is a chain-like structure that forms the theoretical basis for selecting acupoints along the meridians and tendons. The entire broad meridian system comprises such chains, as described in ancient Chinese texts. In addition to the chain structure theory, other principles such as the bowstring theory, drawbar theory, and lever theory are also employed [16]. Furthermore, there are unique principles proposed by individual authors, such as the principle of *qi* fetus (a physiological state where a woman exhibits pregnancy-like symptoms but is not pregnant), the principle of force and qi, and the principle of *yin* embracing *yang*. The principle of qigong, as it was known in ancient times, will be explored and discussed later. Additionally, we must consider the body's proprioception, its neural reflex arc, and the stabilization of both. Instability in the human body can disrupt proprioception, while disruptions in the neural reflex arc can lead to injury.

Mr. Zhang Tianmin proposed the bowstring theory [17], which compares the bones in the body to the body of a bow and the muscles attached to the bones to the string. According to the principles of mechanics, there are four areas where the

tension in a bow is highest: where the bow and string meet, as well as at the center of both. The bow is thickest from the handle to the nock, and thins out towards the point where it meets the string, allowing for flexibility and maximum tension. Let's consider the spine as an example. While many modern individuals view the four physiological curves in the spine as four separate bows with muscular soft tissues acting as strings (cervical, thoracic, lumbar, and sacral), this perspective is incorrect. The authors agree with the ancient understanding that the spine should be viewed as a single bow. However, modern exercise techniques often break down this overall bow into four individual bows, increasing interaction between these segments and contributing to the higher prevalence and younger age of cervical and lumbar spine diseases.

Another theory is the drawbar theory, which is also relatively easy to understand. For instance, imagine a utility pole secured to the ground by four wire ropes, forming a stable multi-triangular structure. If one were to step on one of the ropes, what would happen? The tension in that particular wire rope would increase. If the pole only had this single rope, it might be more prone to tipping over. However, since the pole has three additional ropes supporting it, to maintain stability, the tension in those other ropes will also increase. Comparing the spine to a utility pole, the muscles surrounding the spine can be likened to these four ropes. If a muscle on one side of the pole contracts, the muscles on the other three sides will contract as well, maintaining the mechanics of the spine.

There is also the lever theory. Due to varying points of muscle attachment, different moments of force are generated. The smaller the moment, the more powerful the muscle needs to be, making it more susceptible to injury. Modern medicine views the four physiological curves in the spine as four separate bows, leading to a tragic situation where illnesses can arise.

The human spine plays a crucial role in maintaining four physiological curvatures. Firstly, it helps reduce the body's center of gravity and enhances stability when walking. Secondly, it acts as an elastic buffer: The cervical curvature cushions the impact on the neck and head, protecting the brain and other organs; the thoracic curvature cushions the impact between the cervical and thoracic vertebrae, safeguarding the chest's visceral action; and the lumbar curvature protects the abdominal cavity by cushioning the impact between the thoracic and lumbar vertebrae.

The author believes that a healthy traditional Chinese spine, characterized by the four physiological curvatures globally recognized in the spinal structure, is designed for upright standing. Achieving an upright stance necessitates the development of these physiological curves. Just imagine a dog naturally develops these curvatures the moment it stands, but prolonged standing can lead to spinal damage. The spine and thorax share a *yin-yang* relationship, interdependent and indispensable to each other. The traditional Chinese spine may also serve as a protective barrier for the hindbrain, cerebellum, and brainstem, the most primitive regions of the brain and the center of life. The cerebellum acts as a coordination center for bodily movements, developed through animal evolution, rather than directly controlling muscle activities. Although it receives sensory information from various body parts, its primary role is to reflect their positional and movement states without initiating conscious activities. The brainstem function is vital for sustaining individual life, encompassing critical physiological processes like heartbeat, respiration, digestion, body temperature regulation, and sleep. Today, the high incidence of cervical and lumbar spondylosis is a testament to the internal harm inflicted by the standard four physiological curves, a shift from using cushioning to leveraging principles.

By dividing one bow into four, not only is recovery impossible, but the lever theory comes into play between the bow and its joints, resulting in structural damage and further complications. Similarly, if a utility pole with four breaks loses its stability, adding more and thicker wire ropes will not help; it will only cause the pole to sway. Therefore, the authors believe that once the bow is compromised, irreversible damage occurs, leading to leverage theory at the point of bow destruction. With the point of bow destruction as the center, it rocks back and forth, causing permanent harm to the bow structure.

While Western medical anatomy thoroughly studies each anatomical system's morphology, function, and pathophysiology, it often overlooks the horizontal connections between these systems, leading to treating symptoms rather than underlying causes. For instance, Western medicine prescribes antibiotics for chronic bronchitis, even if no infectious agent is detected, resulting in ineffective treatment [17].

The torso bow is the most crucial part of the human body, serving as the largest pillar bridge. There are five bows in total, which can be observed in the stance of ancient martial artists and those who carry heavy loads on their shoulders. These five bows consist of the main bow (core), two upper bows (arms), and two lower bows (legs). The author believes that there is no one in the world who is so perfectly aligned that they can effortlessly bow forward and backward without risking injury. No one can defy the laws of nature and physics. While a bow can be reflexive without causing harm, common sense dictates that any reflexive bow motion will ultimately destroy the bow. With just one reflexive movement, the bow becomes permanently damaged and transforms into another body structure. The bow plays a significant role in storing energy and momentum. If the human body's bow is destroyed, it may take some time for the body to regulate and temporarily compensate for the loss, but over time, it can lead to various health issues throughout the body. At first, people may not notice any problems, but as time passes, certain aspects of the damage will become apparent. By then, it may already be too late to address the health issues at hand. As early as a decade or more ago, even in infancy, individuals began to display signs that eventually developed into diseases. This is the author's research and response to current health issues. In ancient times, there was a story about Bian Que, a famous doctor in ancient China, meeting King Cai Huan. Without exercise and lifestyle habits that prioritize the protection of one's physical arches, injuries and illnesses are inevitable. This is why it is common to observe a person’s reflexive bowing of their elbows and knees, anterior pelvic tilt, and rib ectopia during a physical examination. These are hidden dangers of disease that modern medicine often overlooks. When our ancestors taught the next generation how to use a shoulder pole, the first lesson in life was not to carry it backward because humans are descendants of apes. In ancient times, it was considered impolite to straighten one's chest and abdomen, as this would compromise the spinal and rib arches - the body's largest bows. Many modern habits and exercise routines contradict those of ancient times. It is no surprise that hospitals are expanding while more patients fall ill. Despite the improving economy, the population's quality deteriorates, and the population size decreases. Even if the population remains small, what good is the most advanced economy without good health? All other possessions are meaningless in comparison.

The human body is a complex system that requires specific mechanics to function properly. Therefore, when one body aspect is compromised, it can lead to further issues. It's essential not only to address the primary problem but also to

consider secondary effects. Protecting the wholeness and originality of the human body is crucial. The Chinese culture of shoulder-carrying has a unique approach to preserving the integrity of the body. Carrying heavy loads throughout life helps prevent spinal degeneration, similar to the principle of pickling where pressure makes good pickles. From an evolutionary standpoint, animal standing is considered an anti-arch behavior, which may be the root cause of spinal diseases in humans. The Chinese load-bearing method is an effective way to counteract spinal recoil and prevent spinal disorders. This approach is scientifically sound and offers numerous benefits. Modern Western sports appear to excel in every aspect, pushing boundaries higher, farther, and faster. They are undeniably powerful, exuding an image of strength, vigor, and vitality that is both infectious and captivating. It seems as though they have the potential to conquer the world. With exercises that engage all body parts, they present a model of modern-day fitness. However, there is one area where they fall short - the spine. Due to this oversight, it is only a matter of time before health issues arise. As the saying goes, "What goes around comes around." The flawed top-level design of Western capitalism has created a situation where this adage rings true. Is this a tragedy or simply a flaw in the system? The top-level design does not need the shoulder-carrying exercises, so the Chinese load-bearing spine under the traditional Chinese shoulder culture is naturally destroyed.

Since China entered the era of reform and opening up and rapid industrialization, the Chinese shoulder-carrying culture has slowly disappeared. The number of elderly individuals with this ability is dwindling, and their descendants are no longer able to bear heavy loads. Clinically, the author has observed cases where both grandfather and grandson suffer from lumbar intervertebral disc protrusion. While conservative treatment or surgery can allow the grandfather to continue laboring, the grandson remains plagued by the disease and is unable to engage in weight-bearing work. It is not uncommon to see elderly individuals with flexural deformities who can perform strenuous tasks without experiencing back pain, despite a lack of imaging evidence. This first case represents a serendipitous discovery and yield, marking the first of its kind to be reported worldwide.

When it comes to studying the spine, Western medicine primarily focuses on spinal morphology and fails to consider actual functional recovery. Imaging studies can only provide information about the structure of the spine and cannot differentiate between functional differences. Additionally, Western medicine tends to focus on the spines of people from Western countries, with the standard spine being based on Western anatomy. As a result, many other countries have accepted these theories and techniques as the "bible" of medicine, leading to a younger trend and increased prevalence of lumbar spondylosis worldwide, particularly in China. This is partly because Chinese society often regards Western knowledge as the only truth, reflecting a cultural hegemony. Over time, the Chinese nation has forgotten much of its valuable knowledge and practices related to the spine. However, it is important to recognize that the Chinese people also possess strong and healthy spines.

4.5.

This is a typical case of a traditional spine that has been affected by the Chinese shoulder-carrying culture, which still retains its load-bearing capacity even after suffering from lumbar spinal stenosis with intervertebral disc protrusion. This

case demonstrates that as long as there is a Chinese traditional load-bearing spine, even if there are pathological changes in the spine such as compression fractures, the shoulder-carrying function will not disappear after conservative treatment and rest, which is the main difference between modern non-shoulder-carrying spines and traditional Chinese ones. This also explains why the hardworking and brave Chinese nation has stood tall for 5000 years without faltering. During the war against the United States to aid North Korea, an American documentary recorded an incident where an American general was puzzled by the Chinese soldiers. The volunteer soldiers were all very thin, weighing only fifty kilograms or less, but they could carry more than one hundred kilograms of weight on mountainous roads and even walk more than one hundred miles. They were all strong-willed individuals.

In the 1970s, the world was in a state of constant change. The power struggle between the United States and the Soviet Union had reached a stalemate, and China faced numerous obstacles in its development. However, during this critical period, former U.S. President Richard Nixon visited China, which led to profound changes in the global situation and greatly benefited our country's development. During Nixon's visit, an accompanying official noticed that Chinese people had a habit of walking with their heads bowed. Curious or perhaps even mocking, he asked a question that caused an awkward moment. Premier Zhou skillfully defused the situation and created a harmonious atmosphere, leaving a deep impression on the Americans. China is a country full of mysterious Eastern colors and has a unique cultural system that differs from the West. Our country in the 1970s was not the same as it was during the late Qing Dynasty. Foreigners' perceptions of China were also influenced by politics. As we gradually prospered, Western views toward China began to shift. Faced with such an awkward situation, Premier Zhou, displaying the astuteness of a seasoned diplomat, responded with shrewdness, "We have a rich heritage of ancient customs. Walking with the head down not only demonstrates humbleness, but also reflects our emphasis on quietness, modesty, and politeness. This is a unique aspect of Chinese tradition." Another popular version of Premier Zhou's response circulated online, “**This is not surprising. Chinese people walk with their heads down because we are on an upward path, striving to reach new heights; while Americans who walk with their heads up are heading downwards**.”

The Chinese Railroad Workers Memorial Monument, built in Virginia City, Nevada, USA: In 1964, the state of Nevada, USA, in honor of its centennial as a state, erected a monument in Virginia City to pay tribute to the Chinese workers who had contributed significantly to its development. Inscribed on the monument are the words: “The Chinese pioneers achieved great accomplishments. They opened mines and constructed roads, and their legacy is renowned in the annals of world history.” Over a century ago, before the Panama Canal was opened, transportation between the east and west of the United States was far from convenient. In response, the U.S. initiated the construction of a transcontinental railroad stretching from the east to the west coast. The most challenging segments of this monumental project were predominantly tackled by Chinese workers.

In the mid-19th century, a large number of Chinese workers embarked on maritime journeys across the Pacific to contribute to the development of America’s western frontier. This marked the first occasion when Chinese people collectively and spontaneously ventured overseas en masse to engage in the early stages of foreign industrialization. At first, it appeared that seeking road builders for the Central Pacific Railroad, tasked with constructing the west segment, would not be challenging. San Francisco was flooded daily with ships bringing numerous Irishmen, yet these workers

struggled to handle the perilous and exhausting nature of the work. They were prone to drinking, brawling, and demanding higher wages. Despite this, hundreds of Irish workers fled every day. The progress was painfully slow, akin to the pace of a snail, resulting in the Central Pacific Railroad laying a mere 50 miles (80 km) of track in two years. Moreover, the white workers were frequently engaging in strikes.

With few other options, Charles Crocker, an executive of the Central Pacific Railroad, proposed recruiting Chinese workers. Adopting a “try and see” approach, the railroad brought in the first group of 50 Chinese workers from southern China to California. Crocker, who oversaw railway construction, championed the idea of employing these workers on a trial basis. S. W. Strawbridge, the construction supervisor, was initially skeptical, questioning their capability to undertake such a significant railway project. To this, Crocker countered with the fact that the Chinese had erected the Great Wall, one of the world’s most colossal architectural feats, effectively silencing the supervisor’s skepticism. In February 1865, the Chinese workers arrived at the railway construction site, under the scrutiny of onlookers who regarded them with a mix of suspicion and skepticism. Initially, they faced disdain not only from their white counterparts but also from supervisors who doubted their capabilities, assuming that due to their perceived physical frailty and stature, they were unsuited for such strenuous labor. Amidst doubt, Crocker, Chief Contractor of the Railroad, argued that “The people who build the Great Wall of China and invented gunpowder could certainly build a railroad”. As anticipated, the 50 Chinese workers, despite their short and slender stature, demonstrated remarkable resilience and work ethic. In stark contrast to the unrestrained, drunkards, and troublesome white laborers, the Chinese workers exhibited exceptional discipline and adaptability, quickly mastering various tasks. This led the railroad to opt for large-scale recruitment of Chinese workers. On May 10, 1869, the culmination of six years of relentless labor was celebrated as the final golden spike was hammered into the railway's sleepers, marking the completion of the Pacific Railway. [18]

Known as "the greatest project in American history," the Railroad was instrumental in propelling the United States forward in the 19th century and remains vital to this day. The railroad, which was pivotal in shaping modern America, owes its existence to the countless Chinese workers whose contributions were paramount. The successful launch of the Central Pacific Railroad stands as a powerful tribute to Chinese craftsmen who leveraged the simple tools, methods, and enduring skills of their agrarian civilization. It is heralded as the preeminent railroad endeavor of the 19th century [19]. Shelley Fisher Fishkin, a professor at Stanford University in the United States, remarked, "It accelerated the progress of the United States as a modern nation.” The completion of the entire railway is likewise celebrated as a glorious milestone in American history. The Chinese workers’ significant contributions were indispensable. Without their labor, the railway could not have been constructed.

4.6.

Anthropological perspective: The human body is supported by the feet, which form the support point for the column that bears the weight of the body. The center of gravity should ideally fall on the midpoint of the feet, known as the foot arch, and humans also have small arch-like structures that support their entire weight. While standing, the knees can remain slightly flexed, a condition known as the knee arch. When viewed from the side, the back side of the lower limb is bowed,

and the lower leg forms an angle of less than 90 degrees with the horizon to ensure that the center of gravity falls on the foot arch. It is common sense and basic reasoning that taller individuals have larger feet, as can be observed in large animals. However, due to technological advancements and differences in thought, lifestyle, and movement patterns during their evolutionary process, Western races have developed body structures that defy this natural law and physics.

As the old saying goes, “Things will develop in the opposite direction when they become extreme.” The traditional Chinese culture has long required women to be reserved and modest, with their eyes downcast, faces covered, and heads bowed. Displaying shoulder joints in front of the body was considered improper, and instead, women were expected to slightly bend their knees and bow their waists. Holding one's head high and chest out was seen as a violation of custom. In public or on the street, if a woman held her head up, she would likely face disapproving stares and criticism from elders for being unbecoming, and would be instructed to correct herself. Ancient dancers were known as *maikos*; the lower class, many people view this as a form of persecution of women in feudal society. However, it has been 40 years since the reform and opening up, and we now live in a modern society. We have the opportunity to empower this generation and the next to hold their heads high and chests out, and to move away from primitive manual labor such as carrying loads on the shoulders. And these two generations have grown into adults.

If we compare the physical fitness and health of the elderly in the past, who lived in an agrarian context, with the younger generation who has received modern Western education, we can observe that the modern agrarian elderly are physically stronger than all the modern young people who engage in physical work. However, there are many aspects that cannot be measured or evaluated using modern scientific and instrumental methods. Modern science has established a set of standards for physical fitness and health that favors the modern man over the farming man. Therefore, if we measure and evaluate according to these modern standards, it is possible that two generations may appear to have poor physical fitness and health. There is no scientific evidence to suggest that the agrarian people were not in good health.

Every descendant of the Chinese nation carries a common belief that their elders and ancestors were physically stronger than the current generation. A survey conducted would reveal that people generally believe that the older generation surpasses modern individuals in terms of work ethic, willpower, and overall physical condition and quality. This notion does not require scientific evidence or data to support it. The human race has an idiom for this: being blinded by lust for money. Humans fail to see the root cause of their problems. They assume that with all the technological advancements, mankind has acquired all knowledge. This is an abnormal way of thinking and is very stubborn. Those whom God wishes to destroy, he first makes mad.

4.7.

What do Chinese people do when they are tired of shoulder carrying? I think there are only four answers: one is switching the load from their left to right shoulder; the second is sitting down and resting for a while; the third is hiring someone to carry it if they have the money; the fourth is throwing it away if they lack the strength or resources! This approach reflects a tendency in Chinese culture to shift responsibilities rather than truly addressing the underlying issue. How would Westerners answer the same question? For example, the invention of the steam engine by Watt led to advancements in

transportation such as the wheel and road construction. The train was developed to transport heavier loads, while the airplane was created for faster travel. In contrast, Westerners tend to adopt a more proactive and problem-solving mindset. Clearly, Westerners strive to find permanent solutions to problems and prioritize achieving results.

This is the difference between Eastern and Western cultures! [20]

*The Chrysanthemum and the Sword – Patterns of Japanese Culture*is an analytical survey of Japanese culture conducted by American anthropologist Ruth Benedict for the U.S. Government's Office of War Information during the Pacific War's counter-offensive phase against Japan. Some of its findings became crucial reference points for the United States and its allies during armistice negotiations with Japan, such as how to handle the Mikado, treat prisoners of war, and temporarily govern Japan. When it was published in 1946, it quickly became a guide for decision-making and behavior during the Allied occupation and administration of Japan, a bestseller for Westerners interested in Japanese culture, and a classic work of cultural anthropology. In this book, the author employs a cultural anthropological approach to explain and interpret the seemingly contradictory aspects of Japanese culture from an external perspective by contrasting the chrysanthemum, the Imperial family's crest pattern, with the sword, which symbolizes the samurai's status. This study offers an external perspective on understanding and interpreting the complexities of Japanese culture. First, it saved the life of the Mikado and his hereditary system. Second, it provided a guide for Americans to understand traditional Japanese culture. Third, it provided Japan with a reference mirror to remake its own cultural image. Fourthly, it provides a classic example of the study of "cultural individuality" for cultural anthropology.

Another important contribution of the theory of "cultural individuality" is that it supports and is the backbone of "cultural relativism" from theory to practice. "Cultural relativism" is based on a large amount of first-hand field research materials and analytical studies by American anthropologists in North and South America and Oceania. Many of its early major findings came from Franz Boas himself, the father of American anthropology, as well as two or three generations of his students. Benedict's *Patterns of Japanese Culture* is one of the most outstanding achievements. The results of their extensive research show that culture develops in countless different directions, that each culture has its own trajectory and pattern of development, that not all cultures develop in the same direction, and that each culture has its own distinctive personality traits and values. "Cultural relativism" emerged as a response to the prevailing "cultural evolutionism" and its offshoot, "Western cultural centrism". The central tenet of "cultural evolutionism" is to view all cultures as developing organisms that progress from simplicity to complexity. It explains cultural differences in terms of being "advanced" or "backward", depending on their stage of development. In contrast, "cultural relativism" asserts that cultures are not "advanced" or "backward", but rather possess unique personalities and values. Clearly, if each culture imposes its own set of behavioral norms on others, it can lead to misunderstandings and conflicts due to differing value systems. However, unlike Westerners, the Japanese have their own traditions, ways of thinking, and behavior shaped by cultural premises vastly different from those familiar to Westerners.

When reading *The Chrysanthemum and the Sword*, Chinese readers can easily relate to the content due to the similarities between Japanese and Chinese cultures. Additionally, Chinese culture is currently facing challenges from Western culture, much like Japan did before World War II. Just as the Japanese were unaware of their own cultural identity and

unique qualities, many Chinese people are also unsure of what sets their culture apart and what aspects they should preserve or discard. While *The Ugly Chinese* serves as a valuable example of cultural self-reflection, it lacks constructive solutions. *River Gothic*, on the other hand, encapsulates the concepts of "yellow earth culture" and "blue ocean culture," which resonates with many Chinese intellectuals. However, the underlying concept of this movement is "cultural evolutionism," which posits that Western blue ocean culture is more advanced than China's yellow land culture. Some proponents even converted to Christianity, a part of Western culture, in pursuit of "evolution." Later, a group of Chinese and Western scholars formed a "think tank" to help China redefine its cultural identity during the reform and opening-up period. They advocated for the restoration of Confucianism and its philosophy of governance. The think tanks were initially enthusiastic but ultimately achieved little. Deep reflection and development of Chinese culture still have a long way to go. [21]

The study of Chinese shoulder-carrying culture is distinct from Japanese kiku knife culture. A deeper examination reveals that Chinese shoulder-carrying is an indigenous and oriental form of physical exercise. Comparing Western sports with Eastern shoulder-carrying highlights the severity of the problem. While Western sports result in injuries, leading to rapid advancements in sports medicine, Eastern shoulder-carrying is a lifelong manual labor exercise. The prevalence of cervical and lumbar spondylosis among modern individuals suggests that the current approach to exercise may be flawed. Chinese medicine has focused on orthopaedics and traumatology for thousands of years, indicating that shoulder-carrying strengthens the body. In contrast, Western sports can cause injuries, particularly to the lumbar spine. These two types of exercise are fundamentally different, with one strengthening while the other injures the body. This creates a competitive and incompatible relationship between them. Continued research may lead scientists worldwide to reach a consensus on the need to reshuffle exercise methods, potentially impacting global politics and economics.

4.8. Thank for: Clarence Nicodemus

Review of: An Oriental Physician’s Views and Thoughts on the Global Prevalence of Lumbar Spondylosis – The traditional shoulder-carrying culture and traditional spine of a large eastern country are disappearing silently

Clarence Nicodemus

Declarations

While the author does not use the “standard” format or organization for the presentation of his ideas, the point he makes is a valid one, although misdirected. Overall, the author is headed in the correct direction when searching for a cause of chronic low back pain (CLBP). NOTE: I believe we are discussing CHRONIC low back pain, not ACUTE low back pain (muscle strains or ligament strains), which is generally self-correcting. Changes in culture from farming to industrial-based labor do influence the strength of the core, or what I believe he calls “waist” strength. Certainly, carrying heavy loads on the shoulders over a lifetime will enhance the strength and stability of the core of the body. Core strength has long been established as the main factor in preventing and recovering from chronic low back pain (CLBP).

Based on my own research for the past 20 years, I offer the following points as a review and/or critique of his paper.

Spondylosis is not a typical cause of CLBP. Wear and aging of the vertebrae and their discs do not cause CLBP; in fact, 85% of cases of CLBP do not involve the spine.

Spinal pain does arise from spinal sources such as fractures, osteomyelitis, moderate to severe spinal stenosis, and verified radiculopathies (i.e., radiculopathies with matching pain, numbness, and positive EMG/NCV tests), aneurysms, severe scoliosis, severe spondylolisthesis, herniated or extruded discs, and the like; but again, these pain-generating conditions amount to about 15% of the presenting cases of CLBP.

Pain arises from the supportive structures of the spine, including ligaments (iliolumbar, posterior sacral, and others), contracted stabilizing muscles of the lumbosacropelvic (LSP) structures (there are over 65 muscles attached to the LSP structures) that are part of the CORE and serve to activate and stabilize not only the lumbar spine but also the sacroiliac joints (SIJ).

The sacrum is the key element in the balancing or reacting of all upper body loads (body elements and weights carried on shoulders or in arms) and the ground reactive loads transmitted through the lower extremities and innominate bones through the SIJs.

The painful elements, as described by patients who have CLBP, most typically come from hip flexor muscles, iliotibial bands, iliolumbar ligaments, not from the spine; although facet syndrome and true disc herniation may be present as well, they are secondary.

Manual manipulation and core strengthening exercises are necessary to help patients recover from CLBP, but they are seldom done effectively without a comprehensive knowledge of the biomechanics of the LSP structural region. This is not to suggest that just one thing is the cause of CLBP, but rather that there are 23 joints within the LSP structure as an integrated region and all must be examined and considered. Most importantly, however, it must be stabilized.

I suspect that the historic Chinese agrarian culture of carrying loads on shoulders served to strengthen the core muscles and stabilize the LSP structure, protecting against the development of CLBP. Modern industrial or digital jobs do not serve this same function, leaving laborers more vulnerable.

I also might mention (without benefit from any research) that the reproductive organs of the body are more appropriately associated with the sacral nerves than the lumbar plexus and that the rise in infertility rates may be more related to sacral dysfunction than lumbar dysfunction as well.

5. Result

Currently, most research on the human spine focuses on the so-called "standard spine" proposed by Western medicine. Interventions and treatments are based on this understanding of the spine. However, it is important to note that for thousands of years, differences in farming and marine cultures, as well as shoulder-carrying and non-shoulder-carrying cultures, have resulted in variations in spinal anatomy between Eastern and Western populations. Due to the dominance

of Western medicine, there is a lack of research into the traditional spinal anatomy of the East. With the rise of technology, many Eastern individuals are abandoning their traditional farming lifestyles, leading to a decline in the number of practitioners of shoulder-carrying techniques. This has created a gap in research and scholarship regarding the Eastern spine. There is also an inadequate understanding regarding China's shoulder-carrying culture within the country itself. This is particularly evident when some of the images and stories of the older generation are presented to the Chinese public as negative exemplars. The reality that hunched elderly men continue to engage in this form of labor is often perceived as a regressive, miserable, coercive, and disrespectful practice. For some, these individuals embody tragic destinies, symbolizing the nation's impoverishment and social inequality. An image of a hunched, elderly woman bearing a hefty load on her shoulders captured the hearts of many when it surfaced. This photograph quickly became one of the top ten most moving images in China for the year 2005 and momentarily took center stage in public discourse. Its eye-catching caption reads: "A Glimpse of Harsh Reality". What do you think after reading it? According to China's development goal, absolute poverty will be eliminated by 2020, and all poor people under the current standard will be "zero". As of the end of 2020, the announcement came that the last impoverished county had been officially removed from the roster. This marks a theoretical triumph over absolute poverty, ushering in an era of comprehensive well-being. She already suffers from a spinal deformity. Does she experience back pain? She has lumbar spondylosis. How can she barely support the weight on her back? What was her condition like when she was young? How does it compare with modern youth? When did she develop the spinal deformity? Did she suffer from osteoporosis or other ailments? What about other health indicators? What were her contemporaries like? There are many factors involved in the study of spinal disorders. Relying solely on Western research on the standard spine to investigate, intervene, or treat spinal issues will not fundamentally solve the spondylosis problem. Currently, with the global outbreak of cervical and lumbar spondylosis, particularly among young people, China is one of the hardest-hit areas. This is also evidence. However, in the past, it was common for nearly every Chinese individual to bear 50 kilograms on their shoulders, and even those with spinal deformities could still manage heavy loads. Numerous individuals lived to old age without showing any signs of spinal deformities or physical health damage, sometimes even surpassing the strength of modern men. For a considerable period, this substantial group of people was overlooked and neglected. Consequently, the study of shoulder-carrying labor has been restricted by moral coercion and economic politics, leading to a significant research void concerning Eastern spine health. Field research and participant observation methods involve researchers personally participating in communities or investigation sites, engaging in activities with the subjects of study, and conducting direct and systematic observation and recording. While field survey methods have been gradually adopted in sociology, anthropology, archaeology, and ethnology, there is still a lack of substantial research on applying these methods to the cultural aspects of the mysterious oriental shoulder-carrying practices. The increasing prevalence and younger age of cervical and lumbar spondylosis has become a significant health issue that poses a threat to human life and well-being. To better understand the various factors contributing to this condition, as well as the pros and cons of the Eastern and Western spine, the author employed the field research method to conduct participant observation and field investigations. By establishing the Physical Examination Center, the Shoulder-carrying Laboratory in Jingjiang Mountain Park in Linhai, and the outdoor area as focal points for our investigations, the author worked collaboratively with participants to conduct in-depth interviews. By combining our findings with previous literature on similar topics, we have developed a detailed outline for our

investigation. This will not only facilitate a deeper understanding of the causes behind the decline of the Chinese shoulder-carrying culture but also provide firsthand information on the morphology and function of the spine in both Eastern and Western societies. In presenting this case study, we aim to highlight a more typical representation and epitome of the traditional Sinicized spine, which is prevalent and representative of China. Through field research methods, the author can comprehensively examine the various factors contributing to the prevalence of cervical and lumbar spondylosis, as well as the pros and cons of the Eastern and Western spine. By studying the truly ergonomic human standard spine, researchers may develop targeted interventions and treatments to minimize the risk of developing cervical and lumbar spondylosis and enhance the success rate of treatment for individuals affected by this condition. This embodies a classic manifestation of the pervasive influence of Chinese shoulder-carrying culture, which can result in spinal hunching. Historically, this type of hunchbackedness due to shoulder-carrying labor was also seen in China, albeit less commonly. The tradition held that “carrying water and chopping wood is the way”, and lifting with the shoulders was not only endorsed but also regarded as a form of Buddhist practice. In contemporary times, there's been particular attention on those who have become hunchbacked from bearing heavy loads under the influence of Chinese shoulder-carrying culture, especially among the elderly who were compelled to carry despite spinal deformities. This group has been branded by Chinese society and education as symbols and evidence of hardship and impoverishment. In stark contrast, modern Chinese youth engage in minimal heavy physical labor, free from the burden of excessive weight on their shoulders, yet cervical and lumbar spondylosis are increasingly common and affecting younger individuals. They find it challenging to stand, sit, or lie down normally, let alone engage in shoulder-carrying labor. Cervical and lumbar spondylosis have emerged as significant health issues, threatening the lives and health of Chinese people and even the whole human race. The author employs field research and participant observation to seek out the healthy spine beneath the Chinese shoulder-carrying culture and to unravel the enigma of the Chinese load-bearing spine.

There are many factors involved in the study of spinal disorders. Relying solely on Western research on the standard spine to investigate, intervene, or treat spinal issues will not fundamentally solve the spondylosis problem. Currently, with the global outbreak of cervical and lumbar spondylosis, particularly among young people, China is one of the hardest-hit areas. This is also evidence.

Field research and participant observation methods involve researchers personally participating in communities or investigation sites, engaging in activities with the subjects of study, and conducting direct and systematic observation and recording. While field survey methods have been gradually adopted in sociology, anthropology, archaeology, and ethnology, there is still a lack of substantial research on applying these methods to the cultural aspects of the mysterious oriental shoulder-carrying practices. The increasing prevalence and younger age of cervical and lumbar spondylosis has become a significant health issue that poses a threat to human life and well-being. To better understand the various factors contributing to this condition, as well as the pros and cons of the Eastern and Western spine, the author employed the field research method to conduct participant observation and field investigations. By establishing the Physical Examination Center, the Shoulder-carrying Laboratory in Jingjiang Mountain Park in Linhai, and the outdoor area as focal points for our investigations, we can work collaboratively with participants to conduct in-depth interviews. By combining our findings with previous literature on similar topics, we have developed a detailed outline for our investigation. This will

not only facilitate a deeper understanding of the causes behind the decline of the Chinese shoulder-carrying culture but also provide firsthand information on the morphology and function of the spine in both Eastern and Western societies. In presenting this case study, we aim to highlight a more typical representation and epitome of the traditional Sinicized spine, which is prevalent and representative of China. Through field research methods, the author can comprehensively examine the various factors contributing to the prevalence of cervical and lumbar spondylosis, as well as the pros and cons of the Eastern and Western spine. By studying the truly ergonomic human standard spine, researchers may develop targeted interventions and treatments to minimize the risk of developing cervical and lumbar spondylosis and enhance the success rate of treatment for individuals affected by this condition.

6. Conclusion

Only by examining the subsequent generation that matures in a non-shoulder-carrying cultural context—approximately 40 years following the cessation of China's shoulder-carrying tradition—can we employ rigorous research methodologies to compare the shoulder-carrying and non-shoulder-carrying generations. Such comparative analysis will yield results that are evident.

However, the body naturally retains its ability and need for movement. Therefore, the relationship between exercise and survival has gradually and logically evolved into the relationship between exercise and physical health in modern society. Regular exercise is essential for maintaining optimal physical health, as determined by the human body’s material basis. Engaging in reasonable exercise not only keeps the body healthy but also promotes relaxation and happiness. Since it satisfies the physiological needs of the human body, exercise is actually the most important means of maintaining good metabolism. In my opinion, the Chinese shoulder is the most in line with the physiological needs of the human body behavior [22].

This case embodies the traditional essence of Chinese shoulder-carrying culture, which has been prevalent for thousands of years. To fully understand this cultural phenomenon, we must examine it from a holistic perspective that encompasses Chinese civilization, customs, and political systems. This can be achieved by studying books and old photographs, as well as observing firsthand the practices of those who carry their burdens on their shoulders. Unfortunately, due to a lack of understanding and research into Chinese shoulder-carrying culture and its traditional significance, there is currently a gap in knowledge about the differences between Eastern and Western traditions. Researchers must address this gap before it becomes an archaeological and intangible cultural heritage relic. We must take action to preserve and promote our unique cultural heritage, particularly the Chinese shoulder-carrying culture, which is not only a vital aspect of the Chinese nation's identity but also has implications for spinal health worldwide. This paper aims to raise awareness among the global scientific community, including China, of the importance of Chinese shoulder-carrying culture.

A Chinese doctor, raised in a culture that emphasized the use of the shoulder-carrying method, has keenly observed and documented the fact that both China's and the world's spines are undergoing significant changes, perhaps even reaching a dramatic drop point. Is this evolution or degeneration? This perspective also aids archaeologists in studying whether

ancient corpses exhibit signs of the "Chinese load-bearing spine", as well as determining whether these individuals engaged in shoulder-carrying activities and when such practices began. In modern anatomy, the concept of the "Chinese load-bearing spine" should be utilized to re-examine existing skeletal remains and rewrite anatomical understanding. Labor shapes and transforms humanity, driving its evolution. Therefore, research into the shoulder-carrying culture should have a profound impact on human civilization, with shoulder-carrying being one of the most crucial factors. It also suggests that the history of literature and philosophy should be revisited, which will inevitably lead to a rethinking and re-evaluation of related disciplines. The study of shoulder-carrying is a key that can unlock many mysteries of Chinese history, as well as shed light on the origins and development of human civilization. All of my research findings are grounded in the study of the "Chinese Load-bearing spine" [13]. As Gao Chengyuan [23], a renowned Chinese historian, posits, "The evolution of civilization is marked by the continuity of subtle clues and expansive visions". "He who helps to uncover it is as valuable as he who discovers it." This represents the "high state of exploration" that humanity should strive for collectively. In Gao's view, China's shoulder-carrying research necessitates interdisciplinary collaboration, with consensus among the majority of experts in leading or key disciplines within authoritative cultural and academic circles being crucial (e.g., the "Cultural Prospecting Project"). We can pose a challenge to the Chinese archaeological community: Was rammed earth construction unique to China in prehistoric times, and was it done by shoulder-carrying? Therefore, a study on the "Chinese load-bearing spine" has far-reaching implications for global science.

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