TR-03 Chinese medicine: from the Shennong Bencao to Tu Youyou

HEALING after the FALL, research library, TR-03

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This report follows the owner's ruling of 12 October 2026. It sets out how Chinese medicine understands the body, the illness and the remedy, in its own vocabulary and on its own logic, before it says what the trials show. It then attaches the evidence, including where the evidence is absent, weak or negative. It builds on TR-13, which covers the Shanghan lun's doctrine of reverse treatment and the purging and bleeding practices, and does not repeat that ground (THRIVING library, TR-13).

1. Findings by section

1.1 The body, the illness and the remedy, in the tradition's own terms

The tradition does not begin with an anatomy. It begins with a physiology of process. The body is a set of transformations, and what moves through them is qi, not a substance in the way blood is a substance but a capacity for action that takes substantial and insubstantial forms. Qi is drawn from food by the spleen and stomach and from air by the lung, stored as essence by the kidney, moved by the liver, governed by the heart. What a Western reader reads as organs, the zang and the fu, are better read as functional systems named after organs. The liver in this account stores blood, keeps the qi moving freely, and governs the sinews and the eyes, which is not a description of the hepatocyte.

Health is free and timely movement. Illness is a failure of movement or of balance, named in paired opposites. Yin and yang are not two things but two aspects of one thing, and the pairs they generate are the working vocabulary of the clinic: interior and exterior, cold and heat, deficiency and excess. The five phases, wood, fire, earth, metal and water, order the correspondences between organs, seasons, flavours, colours, emotions and climates, and supply two cycles, generation and restraint, by which a disorder in one system is expected to show in another. The six excesses, wind, cold, summer heat, damp, dryness and fire, name the external causes. The seven emotions name the internal ones.

The channels, jingluo, are the routes along which qi and blood move. Paul Unschuld has argued that the standard English word meridian imports a cartographic idea the Chinese texts do not carry, and that channel or conduit is better, since the texts describe something closer to an irrigation system than a line of longitude (source 63, read as a secondary summary of Unschuld's Suwen translation, not in the original). Twelve regular channels pair with the zangfu and eight extraordinary vessels run across them.

The core clinical act is not diagnosis in the Western sense. It is bian zheng lun zhi, discriminating the pattern and then determining the treatment. The unit of practice is the zheng, usually rendered pattern, a configuration of signs taking in the pulse at six positions on the two wrists, the colour and coating of the tongue, the complexion, the voice, the smell, appetite, stool and urine, sleep, sweating and the patient's own account. Two patients with the same microbial disease may carry different patterns and receive different formulae, and one patient's pattern may change within a week. This is the tradition's great strength at the bedside and the thing that makes its trials malformed.

The canon. The Huangdi neijing, in its two parts Suwen and Lingshu, is the theoretical foundation and is a compilation, not a book by one hand. Unschuld reports that twentieth-century scholars place its language and ideas between about 400 BCE and 260 CE, and argues that only a small part of the received text carries concepts earlier than the second century BCE. Wang Bing completed a revision in 762 CE and gave it its present eighty-one chapters, and the standard text descends from the eleventh-century Imperial Editorial Office, from 1053 CE. Nathan Sivin argues for a first-century BCE date (source 63). The Shennong bencao jing is the earliest surviving pharmacopoeia, usually placed in the Eastern Han, 25 to 220 CE, recording 365 medicinals in three grades, upper-grade substances held safe for long use, middle-grade therapeutic with possible mild toxicity, lower-grade for specific illnesses and short courses. The original is lost and reconstructions disagree on the counts within the grades, one giving 141, 111 and 103, another 120, 120 and 125 (source 64). The Shanghan zabing lun of Zhang Ji, about 200 to 210 CE, is the formulary that still organises prescribing, and TR-13 covers its doctrine that mistaken purgation is an iatrogenic injury with a named syndrome of its own (THRIVING library, TR-13). The Bencao gangmu of Li Shizhen, 1518 to 1593, describes 1,892 drugs, 1,094 of them plants, 444 animal and 275 mineral, with directions for about 11,000 prescriptions. Sources disagree on the date, Britannica giving completion in 1578, other records a first draft in 1578 and printing at Nanjing in 1596, and a University of California Press description dating the oldest surviving fifty-four-volume woodblock copy to 1593 (sources 65, 66). The widely quoted figure of 11,096 prescriptions could not be confirmed [VERIFY].

The tradition is not one school. The Jin and Yuan dynasties produced four masters, usually Liu Wansu, about 1110 to 1200, who founded the cold and cooling approach, Zhang Congzheng, died 1228, Li Gao, also called Li Dongyuan, who emphasised the spleen and stomach, and Zhu Zhenheng, 1282 to 1358. The warm disease, wenbing, school arose where the cold damage framework handled epidemics badly: Wu Youxing's Wenyi lun of 1642, then Ye Gui, also called Ye Tianshi, whose dates are given as 1667 to 1747 or 1666 to 1745, who supplied the four-stage scheme of wei, qi, ying and xue, then Wu Tang's Wenbing tiaobian of 1798. Wang Qingren, 1768 to 1831, examined corpses and published the Yilin gaicuo, Correcting the Errors in the Forest of Medicine, whose blood-stasis formulae are still used (source 67). What is sold worldwide as Traditional Chinese Medicine is a curriculum standardised in the People's Republic from the 1950s, and Unschuld, Volker Scheid and Kim Taylor have argued that the standardisation flattened a plural and contested body of practice. A post-Fall reader is not inheriting one doctrine but a long argument.

A note on restricted material. Parts of this tradition pass by lineage, shi cheng, from master to disciple, families hold secret formulae, mi fang, that are not published, and the Daoist internal-cultivation and alchemical strands pass by initiation. These exist, they are restricted, and their content is not reproduced here.

1.2 The formulary on its own logic

A Chinese formula is not a drug with adjuncts. It is a composition with named roles, jun, chen, zuo and shi, sovereign, minister, assistant and envoy. The sovereign addresses the main pattern, the minister supports it or treats a coexisting pattern, the assistant moderates the sovereign's harshness or treats a secondary sign, and the envoy directs the formula to a channel or harmonises the whole. Gancao, liquorice root, Glycyrrhiza uralensis, is the commonest envoy, and the tradition's stated reason for including it is that it reduces the harshness of the rest.

Each drug carries four natures, cold, cool, warm and hot, five flavours, sour, bitter, sweet, pungent and salty, a direction of action and an entry into named channels. These are clinical descriptions of what a substance does to a patient, built by accumulation, and they are stated in the vocabulary of the pattern, so that a cold formula treats a heat pattern.

Paozhi, the processing of crude drugs, is a serious craft within the tradition. Roots are soaked in brine, vinegar, wine or honey, steamed, dry-fried, fried in sand, charred, or boiled with liquorice and black beans, and the tradition holds that processing changes what the drug does and lowers its toxicity. For Aconitum carmichaeli that claim turns out to be chemically exact, and section 1.7 gives the numbers.

Formulae are modified at the bedside. A classical prescription is a base to which the physician adds and subtracts

according to the pattern in front of him. The tradition's own criterion of a good formula is fit to the pattern, not fit to the disease, which is why the question "does Xiao chai hu tang work" is, within the tradition, a malformed question.

1.3 Acupuncture and moxibustion on their own terms

Needling is held to regulate the movement of qi in the channels. The practitioner selects points, inserts a fine needle to a specified depth, and manipulates it until the patient reports de qi, an aching, heavy, distending or electric sensation at the point, which the tradition treats as the sign that the qi has arrived and as the necessary condition for effect. The needle is then retained, reinforced or reduced by defined manipulations, and withdrawn. Points are located by proportional body measurement, the cun, so that location scales to the patient.

Moxibustion, jiu, is the application of heat from burning mugwort. The herb is Artemisia argyi, ai ye, and in Japan Artemisia princeps. Leaves are dried, aged, milled and sifted until what is left is a pale fibrous wool, ai rong, free of stem and coarse fibre. Aging matters within the tradition and has a modern correlate: a 2024 study found naturally aged leaves of one year or more optimal, and sought artificial aging conditions to shorten the process, proposing caffeic acid as a quality marker (source 68). The wool is rolled into cones burnt directly or on a barrier of ginger, salt or garlic, or compressed into a stick held above the point. The sensation sought is a deep penetrating warmth, not a burn.

Two point indications matter most to this book, because they are the two best supported by trials. BL67, Zhiyin, at the outer corner of the little toenail, is the classical point for turning a breech fetus by moxa stick. PC6, Neiguan, two cun proximal to the wrist crease between the tendons, is the classical point for nausea and vomiting, treated by needle, by pressure or by a band.

Acupuncture and moxibustion need almost no supply chain. That is the fact that makes this section matter after the Fall more than any herb in the pharmacopoeia, and it is also what makes their harms dangerous, because the barrier to practice is so low.

1.4 The twentieth century: what theory predicted and what screening found

Project 523 and artemisinin. The project was launched at a meeting in Beijing on 23 May 1967, from which it takes its name, after North Vietnam asked China for help against drug-resistant malaria. It was decided at the outset to work from two directions, new synthetic compounds and traditional Chinese medicines. The synthetic arm designed or screened more than 50,000 compounds, of which 29 reached clinical trials, and Zhou Weishan's account puts the number of herbs and compounds screened by other groups at more than 40,000 without satisfactory result (Su and Miller 2015).

Tu Youyou joined in January 1969 as a team leader at the Academy of Traditional Chinese Medicine in Beijing. Her group reviewed more than 2,000 recipes and compiled 640 for evaluation within three months, then tested extracts from more than 100 plants against Plasmodium berghei in rodents. An early Artemisia annua extract gave about 68 per cent inhibition, but repeats gave 12 to 40 per cent, and the irreproducibility sent the team back to the texts (Su and Miller 2015).

What the text said matters, because the story is usually told wrongly. Ge Hong's Zhouhou beiji fang, the Handbook of Prescriptions for Emergencies, about 340 CE, does not describe a decoction. It directs the user to take a bunch of qinghao, soak or squeeze it in cold water, wring it out, and drink the expressed juice raw (Su and Miller 2015, Hsu 2006a). Tu inferred that heat was destroying the active compound and moved from ethanol, boiling at 78 degrees Celsius, to ether, boiling at 35. Sample 191 gave 100 per cent inhibition in rodent and monkey malaria on 4 October 1971, and she reported 95 to 100 per cent efficacy in animals at Nanjing on 8 March 1972. In August 1972 a clinical team on Hainan Island treated 21 patients, 11 with Plasmodium vivax, 9 with P. falciparum and 1 mixed, with results better than the chloroquine control, and 9 further cases in Beijing agreed. On 8 November 1972 the

group isolated a white crystal, melting point 156 to 157 degrees Celsius, named qinghaosu, curing rodent malaria at 50 to 100 mg/kg. Dihydroartemisinin, more soluble and more potent, followed (Su and Miller 2015). Tu's own 2011 account in Nature Medicine is the source usually cited for this chronology, and was available to this report only as a bibliographic record (source 4) [VERIFY].

Elisabeth Hsu's two 2006 papers are the necessary corrective and the book should follow her rather than the Nobel citation. First, qinghao in the classical materia medica is not one plant. Artemisia annua and Artemisia apiacea were both known and easily confused, and both supplied the drug. Shen Gua in 1086 and Li Shizhen in 1596 distinguished them and preferred A. apiacea for particular fever and joint complaints, and A. apiacea is the one with less artemisinin (Hsu 2006b). Second, the classical indication is not malaria. The 1972 report linked qinghao to bone steaming and heat vexation, not to malaria, and the route to malaria ran through nüe, a premodern term for intermittent fevers that only later became the scientific word. Ge Hong was the first to recommend qinghao for intermittent fevers, and the identification with malaria is a retrospective reading (Hsu 2006a). Third, Hsu credits the result to an institutional arrangement rather than to a tradition or a hero: scientists trained in Chinese medicine working beside historians of medicine with textual expertise, in a system that forced the dialogue. She declines to treat the episode as a validation of traditional medicine, and notes that the wringing-out step, which a pharmacognosist later suggested might produce a useful emulsion, remains an untested hypothesis (Hsu 2006a).

What the episode proves is narrow. A fourth-century emergency handbook supplied two things, a plant name and a preparation temperature. It did not supply the pharmacology, the structure, the dose, the derivative, the resistance profile or the combination therapy. Everything else came from a laboratory, a rodent model, chromatography and a national programme employing hundreds of people over years. The ratio is the finding: of more than 2,000 recipes read and 640 evaluated, one plant and one preparation hint survived.

And the plant does not substitute for the drug. WHO stated in June 2012 that it does not recommend Artemisia annua plant material in any form, including tea, for treating or preventing malaria, noting that the highest artemisinin concentration released into one litre of tea is less than 20 per cent of a 500 mg pharmaceutical dose, so that matching one tablet would mean about five litres of tea a day for at least seven consecutive days (source 52). The 2019 position is broader: WHO does not support the promotion or use of Artemisia plant material in any form for prevention or treatment, because artemisinin content varies widely, is often too low to clear all parasites and prevent recrudescence, and widespread use could hasten artemisinin resistance (source 51). The counter-evidence is thin and uncontrolled. Daddy, Weathers and colleagues reported 18 patients with severe malaria who had failed artemisinin combination therapy or intravenous artesunate and recovered on 0.5 g of dried-leaf Artemisia twice daily for 5 days, a total delivered artemisinin dose of about 55 mg, which is a case series with no control (source 53). Yields are also against it: seed-propagated plants typically carry under 1 per cent artemisinin by dry weight at under 25 kg per hectare, selected clones reach 1.8 to 2.16 per cent, and ordinary field plantings in India and Ghana gave 8.88 and 9.57 kg per hectare (source 54). A post-Fall village can grow the plant. It cannot make the drug.

The rest of the screen. Ephedrine was isolated from ma huang, Ephedra sinica, by Nagai Nagayoshi, with sources giving 1885 or 1887, then largely forgotten in the West until Ko Kuei Chen and Carl Schmidt published its pharmacology in the Journal of Pharmacology and Experimental Therapeutics in 1924, 24:339, working at far smaller doses than Nagai and showing its value in asthma (sources 40, 41, 42). Arsenic trioxide for acute promyelocytic leukaemia came out of Harbin, where in March 1971 Han Taiyun of the First Affiliated Hospital of Harbin Medical College began treating cancer patients with a formula collected from traditional practitioners containing arsenic compounds, mercury chloride and toad venom. The Harbin group, with Zhang Tingdong central, stripped out the inactive parts and identified arsenic trioxide as the agent (sources 38, 39). In 1994 Chen Zhu and colleagues at Shanghai Second Medical University, with the Harbin group, treated 15 relapsed patients and reported complete remission in 14 (source 38). The endpoint is Lo-Coco and colleagues in 2013: 156 patients with low or intermediate risk disease randomised to all-trans retinoic acid plus arsenic trioxide or to ATRA plus chemotherapy, two-year event-free survival 97 against 86 per cent, two-year overall survival 99 against 91, at the cost of grade 3 or 4 hepatic toxicity in 63

per cent against 6 and QTc prolongation in 16 per cent against none (Lo-Coco et al. 2013). Berberine, from Coptis chinensis and other plants, reduced stool volume in 165 adults with acute diarrhoea from enterotoxigenic Escherichia coli and Vibrio cholerae after a single 400 mg oral dose, with 42 per cent against 20 per cent free of diarrhoea at 24 hours (Rabbani et al. 1987, read through a secondary review, source 49). A 2022 meta-analysis of 37 studies and 3,048 patients found berberine lowered HbA1c by 0.63 percentage points, confidence interval 0.53 to 0.72, in type 2 diabetes, with most trials Chinese (Xie et al. 2022). Huperzine A, from the club moss Huperzia serrata, is licensed in China for Alzheimer's disease, and the Cochrane review found insufficient evidence from six trials of mostly low quality (source 46), while a later meta-analysis of 20 trials and 1,823 participants reported improved Mini-Mental State scores at 8, 12 and 16 weeks with most trials at high risk of bias (source 47). Tripterygium wilfordii, lei gong teng, beat sulfasalazine in a 24-week trial of 121 patients, 65 against 33 per cent achieving a 20 per cent improvement (Goldbach-Mansky et al. 2009, read in secondary summary), and in the 207-patient TRIFRA trial gave an ACR50 of 55.1 per cent against 46.4 for methotrexate and 76.8 for the combination (Lv et al. 2015). A meta-analysis of 23,256 users found adverse events in 26.7 per cent, rising to 31.0 beyond six months, with adverse reproductive outcomes in 11.7 per cent, and a refined extract at 20 to 30 mg a day for 1.5 to 5 months has produced antifertility effects in men (Zhang et al. 2016).

The score. From a materia medica of nearly 1,900 entries and a national screening programme, the twentieth century produced one first-line global drug class, artemisinin, one drug that changed asthma care and then became a public health problem of its own, ephedrine, one curative leukaemia therapy, arsenic trioxide, and a short list of partial successes. None was predicted by the theory. Qinghao was not classified as an antimalarial. Ma huang is a warm, pungent, exterior-releasing herb for wind-cold without sweating, which is a fair description of a decongestant and bronchodilator but is not why it was screened. Arsenic came from a folk cancer formula, not a classical indication. The tradition supplied the candidate list. The laboratory supplied every discrimination that mattered.

1.5 The Barefoot Doctor's Manual as a model of combining systems

Mao's directive of 26 June 1965 ordered the stress of health work put on the rural areas, on the ground that the Ministry of Health served about 15 per cent of the population, mainly urban. Peasants of about twenty with some schooling were given three to six months of training at county or commune hospitals and sent back to their brigades, working half the day in the fields. The name chijiao yisheng, barefoot doctor, marked kinship with the peasantry. A 1977 photograph caption claims more than 1,500,000 of them, a propaganda figure and not an independent count, while a National Library of Medicine exhibit says over one million had been trained by the 1970s (sources 59, 60).

The manual was published by the Institute of Traditional Chinese Medicine of Hunan Province in 1970, translated and reproduced in limited quantity by the Fogarty International Center of the US National Institutes of Health in 1974, and reprinted commercially in 1977 by Running Press in Philadelphia and by Routledge and Kegan Paul in London, the English editions varying from 372 to about 942 pages (source 55, catalogue records read, the 1974 PDF exceeded the fetch size limit and the text itself was not read) [VERIFY the content claims below against the text].

What it teaches the book is structural, and the structure is right. It put both systems in one book for one reader: anatomy, hygiene, sanitation, immunisation, birth control, obstetrics, infectious disease, first aid, Western drugs, Chinese herbs and acupuncture, aimed at someone with a few months of training and no supervisor on call. That is exactly the book HEALING after the FALL is. It treated prevention as the main business, and the documented gains of the era came from sanitation, water, latrines, snail control for schistosomiasis, immunisation and maternal care rather than from the herbal sections, with Zhu and colleagues finding in a 1989 WHO Bulletin survey that infant mortality, immunisation coverage and infectious disease rates worsened where the cooperative medical system declined (source 58). And it was a referral system, not a self-sufficiency fantasy: the barefoot doctor's job included deciding what to send on.

Its failures instruct as much. It had no quality control over what it printed, so an error reached a million readers at once. It carried the political claims of its moment, including the overstatement of acupuncture anaesthesia. It

produced almost no usable data, and Western critics were right that the programme's success could not be assessed for want of credible figures. And it collapsed with its funding, ending about 1985 when the collective economy that paid for it was dismantled, after which peasant health crises increased sharply (Zhang and Unschuld 2008, read in summary, sources 56, 57).

On acupuncture anaesthesia the record should be stated plainly, because the book must not inherit the claim. James Reston's appendix was removed in Beijing in July 1971 under local anaesthetic, xylocaine and benzocaine, and acupuncture was used afterwards for postoperative pain. The widespread belief that he was operated on under acupuncture anaesthesia is false (source 61). Chinese practice in the 1970s claimed 25 to 35 per cent of surgery under acupuncture anaesthesia. A 1990 study in Anaesthesia of 20 thyroid adenoma operations found that acupuncture did not provide complete analgesia and required a mean of 45 mg of pethidine during surgery, the authors concluding it was safe and preferable to general anaesthesia only where facilities were short (source 62). Modern Chinese practice calls it acupuncture-assisted anaesthesia, which is the honest name.

1.6 Acupuncture and moxibustion: what the trials show

Chronic pain. The strongest evidence is the individual patient data meta-analysis of Vickers and colleagues. The 2012 paper pooled 29 of 31 eligible randomised trials with adequate allocation concealment, 17,922 patients. Acupuncture beat both sham and no-acupuncture control for every pain condition, p less than 0.001. Against sham the standardised mean differences were 0.23, confidence interval 0.13 to 0.33, for back and neck pain, 0.16, CI 0.07 to 0.25, for osteoarthritis, and 0.15, CI 0.07 to 0.24, for chronic headache. Against no acupuncture they were 0.55, 0.57 and 0.42 (Vickers et al. 2012). The 2018 update added 13 trials for 39 trials and 20,827 patients, found differences close to 0.5 standard deviations against no acupuncture and close to 0.2 against sham, only about 15 per cent decay at one year, and smaller effects in sham-controlled trials using a penetrating needle (Vickers et al. 2018) [VERIFY the journal, reported as Journal of Pain 2018 but not confirmed against the article record]. Read honestly in both directions: a 0.2 standard deviation advantage over sham is real, robust across twenty thousand patients, and clinically small, while the 0.5 advantage over no treatment is what a patient actually experiences and most of it is not attributable to the needle.

Headache. Linde and colleagues 2016, Cochrane, acupuncture for migraine prophylaxis: 22 trials, 4,985 participants. Headache frequency at least halved in 41 against 17 per cent with no acupuncture, 4 trials, about 2,500 participants, number needed to benefit 4. Against sham, 50 against 41 per cent after treatment, 14 trials, 1,825 participants, and 53 against 42 at follow-up. Against prophylactic drugs, 57 against 46 per cent at three months, risk ratio 1.24, with no significant difference at six months and fewer side effects and dropouts on acupuncture. Evidence moderate (Linde et al. 2016a). For tension-type headache the responder rate was much higher with acupuncture than control, the result dominated by one good trial of about 400 participants whose effect persisted at six months, and four trials against physiotherapy, massage or exercise found no superiority for acupuncture. Side effects occurred in 17 per cent of acupuncture against 12 per cent of sham participants, odds ratio 1.3, CI 0.60 to 2.7, and one of 420 acupuncture participants withdrew for adverse effects against none of 343 sham (Linde et al. 2016b).

Nausea and vomiting. This is the strongest result in the field and the most useful after the Fall, because it needs no needle. Lee, Chan and Fan 2015, Cochrane, stimulation of PC6 for postoperative nausea and vomiting: 59 trials, 7,667 participants. Against sham, nausea risk ratio 0.68, CI 0.60 to 0.77, 40 trials, 4,742 participants, vomiting RR 0.60, CI 0.51 to 0.71, 45 trials, 5,147 participants, rescue antiemetic RR 0.64, CI 0.55 to 0.73, 39 trials, 4,622 participants. Against antiemetic drugs there was no difference, nausea RR 0.91, vomiting RR 0.93, rescue RR 0.87, all intervals crossing 1 (Lee et al. 2015). Only two of the 59 trials were at low risk of bias in all domains and 25 at high risk in one or more. The review has since been superseded by a 2025 network meta-analysis (source 10), not read here. Stimulation modality varied and included acupressure and wristbands as well as needles. In pregnancy the picture is weaker: small placebo-controlled trials of PC6 wristbands in Iran and Pakistan found improvement in nausea frequency and severity but not in vomiting frequency or nausea duration, with the authors themselves

attributing part of the effect to placebo (sources 78, 79). Ginger has the steadier evidence there, a pooled review of five randomised trials finding reduced nausea severity against placebo with no sign of increased pregnancy complications, at about 1 g a day, a figure the reviewers suggested rather than established (source 80).

Breech presentation. Cardini and Weixin's 1998 JAMA trial randomised 260 primigravidas at 33 weeks with ultrasound-confirmed breech at two hospitals in Jiangxi. The intervention was moxa at BL67, 15 minutes each side, so 30 minutes a session, once daily for the first 87 women and twice for the next 43, for 7 days, repeated for 7 more if still breech. At 35 weeks 75.4 per cent were cephalic against 47.7, p less than 0.001, relative risk 1.58. At delivery the gap narrowed to 75.4 against 62.3 per cent, p equals 0.02, after external cephalic version in 24 controls and 1 intervention subject. Fetal movement counts were higher, mean 48.45 against 35.35 (Cardini and Weixin 1998). The trial was unblinded. An Italian replication in non-Chinese women was stopped at 123 of the planned sample with no difference at 35 weeks, 34 against 36 per cent (source 14), while a Spanish multicentre primary-care trial found 58.1 against 44.8 per cent cephalic at term (source 15).

The Cochrane review moved over time and the book must cite the current one. Coyle, Smith and Peat in 2012 pooled 8 trials and 1,346 women and found moxibustion did not reduce non-cephalic presentation at birth against no treatment, p equals 0.45, though moxibustion plus acupuncture did, RR 0.73, CI 0.57 to 0.94 (Coyle et al. 2012). The 2023 update covers 13 studies and 2,181 women and reports, for moxibustion plus usual care against usual care, non-cephalic presentation at birth RR 0.87, CI 0.78 to 0.99, 7 trials, 1,152 women, moderate certainty, and against sham moxibustion RR 0.74, CI 0.58 to 0.95, moderate certainty. Caesarean section did not change, RR 0.94, CI 0.83 to 1.05. One trial reported adverse events in 27 of 65 treated women against 0 of 57 controls, very low certainty, commonly increased fetal movement, uterine contractions, nausea, headache and burns from holding the stick too close (Coyle et al. 2023).

That is the best-supported single procedure in this report for a village with no hospital, and the reason is arithmetic. Breech at term ends in caesarean section or in a dangerous vaginal breech delivery, and after the Fall there is no caesarean section.

The null fields. Hinman and colleagues in JAMA 2014 randomised 282 Australians aged 50 and over with chronic knee pain to no acupuncture, needle, laser or sham laser for 12 weeks and found no significant difference between active and sham acupuncture in any outcome at 12 weeks or at one year, the advantage over no treatment being judged of clinically unimportant magnitude and not persistent (Hinman et al. 2014). The 2014 Cochrane review of acupuncture for smoking cessation, 38 studies, found electrostimulation no better than sham (source 69). The 2008 Cochrane review of acupuncture in in vitro fertilisation reported a live birth benefit, but four later meta-analyses between 2008 and 2010 concluded there is no evidence that acupuncture raises clinical pregnancy or live birth rates, and a later JAMA trial of more than 800 Australian and New Zealand women failed to confirm a difference (source 70).

Mechanism and the sham problem. Goldman and colleagues in Nature Neuroscience in 2010 found that needling in mice released adenosine at the site, that the antinociceptive effect required the adenosine A1 receptor, that an A1 agonist injected at Zusanli reproduced the effect in wild-type but not knockout mice, and that blocking adenosine breakdown potentiated it (Goldman et al. 2010). Critics noted the study had no acupuncture control. Kaptchuk and colleagues in the BMJ in 2006 compared a sham acupuncture device with an inert pill in 270 adults with chronic arm pain and found the sham device produced significantly greater improvement in reported pain, while objective measures of arm function and grip strength did not differ, concluding that placebo effects are malleable and depend on the behaviours embedded in medical rituals (Kaptchuk et al. 2006). Both are true at once. Needling does something local and physiological. The ritual around it does something larger. Sham-controlled trials measure the first and miss most of the second.

Positive-result bias. Vickers and colleagues in 1998 reviewed Medline abstracts from 1966 to mid-1995. Of 252 controlled acupuncture trials, every trial originating in China, Japan, Hong Kong and Taiwan was positive, and 10 of

11 from Russia and the USSR. For non-acupuncture interventions, 75 per cent of trials published in England found the test treatment superior, against 99 per cent in China, 97 in Russia and the USSR, 95 in Taiwan and 89 in Japan, and no trial published in China or the USSR found a test treatment ineffective (Vickers et al. 1998). A later review of acupuncture trials in Chinese journals found 838 of 840, 99.8 per cent, positive on primary outcomes. This is the most important methodological fact in the field, because most of the world's acupuncture and Chinese herbal trials are run in China, and it means a positive Chinese trial carries close to no information.

Herbal formulae in trials. Bensoussan and colleagues in JAMA in 1998 randomised 116 patients meeting Rome criteria for irritable bowel syndrome to individualised Chinese herbal formulations, n equals 38, a standard formulation, n equals 43, or placebo, n equals 35, double blind, and reported significant improvement in both herbal arms over placebo with benefit persisting longer in the individualised arm (source 72, read in secondary summary only) [VERIFY the effect sizes]. Sheehan and Atherton randomised 47 children with extensive non-exudative atopic eczema to an active or placebo plant mixture in a double-blind crossover trial in 1992, about 21 per cent lost to follow-up, reporting a percentage change in erythema of about 45 per cent, CI 13.4 to 89.7, and in surface damage of about 57 per cent, CI 19.2 to 97.9, with no adverse events recorded in the active arm, with a companion adult trial in the Lancet the same year (source 71, figures from the Cochrane data tables). Later reviews judge the eczema evidence encouraging but insufficient and raise safety doubts, and a systematic review of herbal irritable bowel trials found 4 of 22 studies of good quality. The honest summary is that a handful of formulae have survived a credible trial, the trials are small, almost none has been replicated outside China, and the individualised prescribing the tradition regards as essential is precisely what the trial design destroys.

1.7 The documented harms

Aristolochic acid nephropathy. This is the largest documented harm attributable to a traditional pharmacopoeia in the modern record. Early in 1992 two Belgian women in their forties were treated for renal failure in Brussels, and a survey of Brussels dialysis units found seven more young women with chronic interstitial nephritis on the same slimming regimen. The clinic had changed its formula in May 1990, adding Chinese herbs, and what was supplied as Stephania tetrandra was in fact Aristolochia fangchi. By 1998 more than 100 cases of rapidly progressive renal failure had been traced to that clinic, about 5 per cent of those exposed. Vanherweghem and colleagues reported it in 1993. Nortier and colleagues in 2000 studied 39 patients who underwent prophylactic nephroureterectomy and found a cumulative dose above 200 g associated with higher urothelial carcinoma risk. Aristolochic acid DNA adducts were found in kidney tissue and the mutational signature is a characteristic A:T to T:A transversion in TP53 (source 25).

The scale in Taiwan is larger. Hsieh and colleagues, using National Health Insurance data covering more than 97 per cent of the population for 1997 to 2003, found aristolochic acid herbal drugs had been prescribed to more than one third of the population. Lai and colleagues found a dose response, more than 30 g of mu tong or more than 60 g of guang fang ji raising chronic kidney disease risk. Among 58,739 Taiwanese end-stage renal disease patients, 1997 to 2002, the standardised incidence ratio was 11.6, CI 10.1 to 13.1, for upper tract urothelial carcinoma and 13.9, CI 12.4 to 15.0, for bladder cancer (sources 25, 27). Among 151 Taiwanese upper tract urothelial carcinoma patients, 83 per cent had aristolactam DNA adducts in the renal cortex with the characteristic transversions. Among 6,548 Chinese herbalists followed from 1985 to 2000 the standardised mortality ratio was 3.10, CI 1.41 to 5.87, for urological cancer and 2.40, CI 1.40 to 3.84, for renal failure and nephritis (source 25). Latency to renal failure with high intake is 1 to 7 years and upper tract malignancy appears mainly within about 3 years. Balkan endemic nephropathy appears to be the same disease from Aristolochia clematitis seed contaminating wheat, Jelaković and colleagues finding adducts and TP53 mutations in most of 67 nephroureterectomy patients from endemic regions and none from non-endemic ones (source 25). IARC classified herbal remedies containing Aristolochia species as a Group 1 human carcinogen in 2002, Monographs volume 82 (source 26). Taiwan prohibited most such herbs in 2003.

The names to know, because this is a botanical problem and after the Fall there is no laboratory: guang fang ji, Aris-

tolochia fangchi, guan mu tong, Aristolochia manshuriensis, ma dou ling, Aristolochia debilis, tian xian teng, Aristolochia contorta, qing mu xiang, Aristolochia cucurbitifolia, and xi xin, Asarum species, which contains a minute amount and has nonetheless been linked to cases. The mechanism of harm in every documented outbreak was substitution, a safe-named drug supplied as a dangerous plant. A village with no laboratory cannot test for aristolochic acid and cannot detect a substitution by taste or appearance. The only available defence is to refuse the family. Aristolochia is recognisable in flower by its bent, pipe-shaped, usually brown or purple perianth, and Asarum, wild ginger, by its paired kidney-shaped leaves and a flower hidden at ground level. Neither should be used medicinally after the Fall for any indication whatever.

Aconite. Fuzi and chuanwu, the processed lateral and parent roots of Aconitum carmichaeli, and caowu, Aconitum kusnezoffii, are central to the warming formulae and are the tradition's most dangerous common drugs. Aconitine is lethal in humans at about 2 mg, with a stated lethal range of 2 to 5 mg and a toxic dose about one tenth of that, roughly 0.2 mg (Zhou et al. 2021). It blocks inactivation of the voltage-gated sodium channel, so the clinical picture is perioral and limb paraesthesia, gastrointestinal upset, hypotension and ventricular tachycardia.

Processing works, and the chemistry vindicates the tradition. The diester alkaloids aconitine, mesaconitine and hypaconitine hydrolyse to far less toxic monoesters such as benzoylaconine. Chuanwu is boiled 4 to 6 hours or steamed 6 to 8 hours before slicing and drying. Baifupian boiled for 2 hours showed no toxicity in mice, while 30-minute and 60-minute preparations still had measurable LD50 values. Steamed or stir-fried fuzi made without brine reduced diester alkaloids 40 to 80 fold. Pharmacopoeia-method processed fuzi had very low or undetectable diester alkaloids and also lower monoester content than the raw drug, so some of the wanted effect is lost with the toxicity. Traditional doses are 1.5 to 3 g for chuanwu, no more than 2 g as a single drug, and up to 15 g for the less toxic processed fuzi, and processed aconite is decocted 1 to 2 hours before the other herbs are added (Zhou et al. 2021).

The failures are documented. Seventeen Hong Kong residents were hospitalised with serious arrhythmias and two died after drinking an aconite tea in 1992 (Tai et al. 1992, read in secondary citation, source 29). A Hong Kong laboratory series of 52 urine-confirmed cases from April 2004 to July 2009 traced causes in 44: prescribing above the recommended dose in 17, 32.7 per cent, hidden poisoning where the herb was dispensed without the patient knowing in 17, 32.7 per cent, inadequately processed herbs in 7, 13.5 per cent, and dispensary error in 2, 3.9 per cent, with no deaths (source 30). A poison centre review of 33 cases from 2005 to 2009 found 52 per cent mild and 27 per cent requiring intensive care, all recovering. Five Hong Kong cases from 2016 to 2017 involved normal doses of properly processed fuzi. At least 53 deaths from aconite poisoning are recorded in China, and onset in reported cases was about one hour (Zhou et al. 2021).

Kampo and sho-saiko-to pneumonitis. Xiao chai hu tang, in Japan sho-saiko-to, is among the most used classical formulae. The first Kampo lung injury report was published in 1989, a 71-year-old Japanese woman, and more followed through the 1990s, particularly in patients also on interferon alpha for chronic hepatitis. A 1998 news report stated that twenty people had died since 1994 and 188 become ill, a figure from a single news clipping not confirmed against Ministry of Health records [VERIFY] (source 74). Japanese regulators required interstitial pneumonitis warnings on a list of Kampo formulations including this one. A Toyama University Hospital study covering 2008 to 2017 found Kampo-induced interstitial pneumonia in three patients, an incidence of 0.08 per cent, all three implicated formulae containing Scutellariae radix, huang qin, which is in sho-saiko-to (source 73). A 2014 Chinese analysis argued the Japanese injuries resulted partly from using the formula on a Western disease diagnosis instead of a traditional pattern differentiation, which is a defence of the tradition that is also a serious warning to any lay reader who prescribes by disease name (source 75).

Heavy metals and adulteration. Ko's 1998 study in the New England Journal of Medicine tested 260 Asian patent medicines bought in California herbal shops. Undeclared pharmaceuticals or heavy metals were found in at least 83, about 32 per cent, and 23 contained more than one adulterant. Lead was found in 24 at a median of 30 parts per million, arsenic in 36 at a median of 180 ppm and mercury in 35 at a median of 329 ppm, against a United States Pharmacopeia cap of 30 ppm for most oral pharmaceuticals. Of 31 products containing pharmaceutical ingredients only

14 declared them, the undeclared drugs including ephedrine, chlorpheniramine, methyltestosterone and phenacetin (Ko 1998, read in secondary summary). A 2015 Australian study using DNA and chemical analysis reported 92 per cent of tested products adulterated or substituted (source 32). Some of the mercury and arsenic is not contamination but doctrine: cinnabar, zhu sha, mercuric sulphide, and realgar, xiong huang, arsenic sulphide, are classical ingredients.

Herb-induced liver injury. Shen and colleagues analysed 25,927 confirmed drug-induced liver injury cases from 308 centres in mainland China, 2012 to 2014, and estimated an annual general-population incidence of 23.80 per 100,000. Traditional Chinese medicines, herbal and dietary supplements were the leading implicated class at 26.81 per cent, ahead of anti-tuberculosis drugs at 21.99 (Shen et al. 2019, read in secondary summary and institutional press release). In a single-centre series of 1,985 cases Chinese herbal medicine was implicated in 28.4 per cent, the commonest single agent being Polygonum multiflorum, he shou wu (source 34).

Ephedra. Haller and Benowitz reviewed 140 adverse event reports submitted to the FDA between 1 June 1997 and 31 March 1999 for supplements containing ephedra alkaloids. Thirty-one per cent were judged definitely or probably related and 31 per cent possibly related. Forty-seven per cent of related cases involved cardiovascular symptoms, the commonest being hypertension, 17 reports, palpitations or tachycardia, 13, stroke, 10, and seizure, 7. Ten events resulted in death and 13 in permanent disability, 26 per cent of the definite, probable and possible cases (Haller and Benowitz 2000). The FDA banned sale in April 2004, and recorded ephedra poisonings peaked at 10,326 in 2002 and fell to 180 by 2013 (source 36).

Acupuncture. Ernst's systematic review identified reports of 86 deaths after acupuncture, pneumothorax the most frequent cause, and he stressed that reports are incomplete, causality sometimes uncertain and under-reporting likely, so that these are the tip of an iceberg (Ernst 2010, read in abstract and secondary summaries). Against that, two prospective British surveys in 2001, about 32,000 consultations by doctors and physiotherapists and 34,000 treatments by traditional acupuncturists, over 66,000 treatments together, found the rate of complications remarkably low, most transient and lasting two weeks at most, with no serious adverse events (White et al. 2001, MacPherson et al. 2001, read through the accompanying BMJ editorial, source 21, which does not give the per-10,000 rates) [VERIFY the component rates].

Infection is the harm a post-Fall village will actually meet, because the needles will be reused. Six patients who received acupuncture at a Boston-area chiropractic clinic developed acute hepatitis B between February and May 1980. Among clinic attendees, 6 of 103 who had acupuncture developed hepatitis B against 0 of 408 who did not. The clinic reused needles after soaking them overnight in benzalkonium chloride, and investigators estimated the virus remained infectious on the needles for 20 to 27 hours despite the soak, recommending disposable needles or reusable needles physically cleaned and autoclaved after every single use (source 22). A 2008 cluster in Languedoc-Roussillon found four cases with near-identical viral strains traced to soiled needles or cupping cups potentially reused (source 24), and British Columbia reported two acute hepatitis B cases in 2014 traced to acupuncturists reusing disposable needles, against a prior annual average of about 1.2 (source 23).

Endangered animals. Rhino horn and tiger bone were removed from the Chinese pharmacopoeia in 1993 and the World Federation of Chinese Medical Societies urged members in 2010 not to use tiger bone or parts of any endangered species. Pangolins are among the most trafficked mammals on earth, with more than a million individuals traded since 2000 according to a CITES report, and in 2019 alone more than 97 tonnes of scales from more than 150,000 African pangolins were intercepted. China removed raw pangolin scales from the pharmacopoeia's approved ingredient list in 2020, but the Environmental Investigation Agency found eight patent formulas still listing them, along with leopard bone and bear bile (source 77). The 2025 edition, effective 1 October 2025, removes the formulas too, nineteen medicines in all, though a pharmacopoeia expert cautions that the compendium is a medical standard and cannot in itself regulate production (source 76). This matters to the book not as a moral aside but as a practical rule: a tradition rebuilt from scratch should be rebuilt without the animal materia medica, which has no evidence behind it, cannot be verified, and destroys species the district will need.

2. Evidence grades

Practice or remedy	What the record shows	Grade
Artemisinin, isolated, in combination therapy	First-line antimalarial worldwide	A
Artemisia annua tea or dried leaf for malaria	Underdosing, WHO opposes, resistance risk, one uncontrolled 18-patient series	D, tending X
PC6 stimulation, postoperative nausea	RR 0.68 nausea, 0.60 vomiting against sham, 59 trials, 7,667 patients, equal to antiemetic drugs	A
PC6 acupressure, nausea of pregnancy	Small trials, nausea improved, vomiting not, authors invoke placebo	C
Moxibustion at BL67 for breech	RR 0.87 against usual care, 0.74 against sham, 13 trials, 2,181 women	A, moderate certainty
Acupuncture, chronic pain	0.2 SD over sham, 0.5 SD over no treatment, 39 trials, 20,827 patients	A for a small effect
Acupuncture, migraine prophylaxis	41 against 17 per cent responders versus no acupuncture, NNT 4	A
Acupuncture, knee osteoarthritis	No difference against sham at 12 weeks or 1 year	X against sham
Acupuncture, smoking cessation and IVF	No advantage over sham	X
Acupuncture anaesthesia for surgery	Incomplete analgesia, mean 45 mg pethidine required	X as claimed
Ephedrine from ma huang	Real bronchodilator and pressor, 10 deaths in 140 FDA reports	B for the drug, X for uncontrolled use
Arsenic trioxide, APL	Two-year EFS 97 against 86 per cent with ATRA	A, and unmakeable after the Fall
Berberine, acute diarrhoea	42 against 20 per cent free of diarrhoea at 24 h on 400 mg	B
Berberine, type 2 diabetes	HbA1c down 0.63 points, 37 studies, mostly Chinese	B
Tripterygium wilfordii, rheumatoid arthritis	ACR20 65 against 33 per cent, adverse events 26.7 per cent, infertility	B for effect, X for lay use
Huperzine A, dementia	Insufficient evidence, most trials high risk of bias	D
Chinese herbal formulae, IBS and eczema	One good trial each, small, unreplicated outside the original country	C
Ginger, nausea of pregnancy	Pooled benefit over placebo, 5 small trials, about 1 g daily	B
Any Aristolochia, and Asarum	IARC Group 1 carcinogen, more than 100 Belgian cases, SIR 11.6 in Taiwan	X

Practice or remedy	What the record shows	Grade
Aconite, unprocessed or overdosed	2 mg lethal, two deaths in the 1992 Hong Kong cluster, 53 deaths in China	X unless processed exactly
Cinnabar, realgar, mineral mercury and arsenic	Mercury median 329 ppm in adulterated patent medicines	X
Rhino horn, tiger bone, pangolin scale, bear bile	No controlled evidence, species destroyed	X

3. Means ledger

Rung	What is possible	What it changes
Hands and knowledge alone	Acupressure at PC6 for nausea, finger pressure at named points for pain, pulse and tongue inspection kept as a record-keeping discipline	Nausea relief equal to a drug in trials, at no cost and no risk
At the hearth	Moxa from gathered mugwort, dried, aged and rubbed, burnt on a stick at BL67 for breech. Ginger decoction for nausea. Ginger, salt or garlic as the barrier under a cone	The breech protocol becomes possible, the largest obstetric gain available without a surgeon
Garden and still	Twelve to twenty cultivated medicinal plants, decoction by weight on a balance, alcohol tinctures, Artemisia annua grown for fever but not for cure	Dosing by weight becomes possible, which is the difference between a medicine and a guess
Village dispensary, 300 people	Forged steel needles, autoclaving in a pressure cooker between every use, a trained lay healer, a written register of every treatment and outcome, a microscope for malaria films	Acupuncture becomes available at an acceptable infection risk, and the register is what the barefoot doctor programme never had
District infirmary, 3,000 people	Controlled cultivation and identification, a herbarium of voucher specimens, a rejection list, supervised processing of toxic drugs, a referral path	Substitution error, the mechanism behind every aristolochic acid death, becomes detectable
Hospital before the Fall	Artemisinin combination therapy, arsenic trioxide with cardiac monitoring, ondansetron, caesarean section, chromatography on every batch	Everything above becomes second line, and none of it is recoverable

What changes at each rung is mostly not the remedy. It is the ability to know what was given and what happened afterwards.

4. Harm test

Aristolochic acid. Kills by renal fibrosis over 1 to 7 years, then by urothelial carcinoma, often after exposure has stopped. The error is substitution, not overdose, and the patient has no symptom until the kidneys are largely gone. A cumulative 200 g of Aristolochia fangchi raised cancer risk in the Belgian cohort. There is no safe dose, no antidote, and no village test. Signs: rising thirst and urine volume, then falling urine volume, anaemia, blood in the urine. What to do then: stop everything herbal, give water and salt, and accept that nothing else exists. Historical case: Brussels, 1992 to 1998, more than 100 women.

Aconite. Kills within hours by ventricular arrhythmia. About 0.2 mg of aconitine poisons and about 2 mg kills. The Hong Kong errors were, in order, dosing above the recommendation, dispensing without the patient knowing, and inadequate processing. First sign is tingling of lips, tongue and fingers within about an hour, then vomiting, faintness, irregular pulse. Never to anyone with heart disease, anyone pregnant, a child, or anyone who has been vomiting or losing fluid. What to do then: there is no antidote a village can hold. Lay the patient flat, keep them warm and still, give nothing by mouth. Most mild cases recover with support. Historical case: two deaths among seventeen, Hong Kong 1992.

Acupuncture. Kills by pneumothorax, the most frequent cause among the 86 deaths Ernst collected, and by infection. The errors are deep needling over the chest, upper back and above the collarbone, and needle reuse. Pneumothorax presents as sudden sharp chest pain and breathlessness during or shortly after treatment and can be delayed by hours. Hepatitis B survived an overnight benzalkonium soak in the Boston outbreak and stayed infectious for 20 to 27 hours. Never in anyone with a bleeding disorder, never through infected or burned skin, never into the abdomen in pregnancy. What to do then: sit the patient up and keep them still. A small pneumothorax seals itself over days, a large one does not and cannot be treated in the village.

Moxibustion. Maims by burning. In the one trial reporting adverse events properly, 27 of 65 treated women had events including burns from holding the stick too close, and the treatment also provoked increased fetal movement and uterine contractions. Never where sensation is reduced, never as direct scarring moxa on a diabetic foot, and stop at once if contractions begin.

Ephedra. Kills by stroke, arrhythmia and hypertensive crisis, with ten deaths and 13 permanent disabilities in 140 FDA reports. Never in high blood pressure, heart disease, thyroid disease or pregnancy, and never for weight or performance.

Herbal liver injury. Polygonum multiflorum, he shou wu, is the commonest single implicated agent in the Chinese series. Signs are loss of appetite, nausea, dark urine, pale stool, then jaundice, usually weeks into a course. Stop the herb at the first of these. Most recover. Some do not.

The general error. The worst thing a lay reader can do with this tradition is prescribe a classical formula by a Western disease name. That is the error Chinese reviewers themselves blamed for the sho-saiko-to pneumonitis deaths, and it is exactly what a book listing formulae against diseases invites.

5. Red flags

These mean the patient will die or be disabled without what the village cannot give.

- Breech presentation still present in labour, with obstruction. There is no caesarean section. Moxibustion from 33 weeks is the one chance and must be taken early.
- Falciparum malaria with impaired consciousness, convulsions, dark urine or inability to stand. Artemisia tea will not clear it.
- Sudden breathlessness with chest pain after needling. A tension pneumothorax kills in minutes and cannot be decompressed safely here.
- Tingling lips with vomiting and an irregular pulse after a decoction. Assume aconite.

- Jaundice developing during a course of herbs. Stop all herbs at once.
- Falling urine output with anaemia in someone who has taken unidentified Chinese herbs for months. Assume aristolochic acid, and tell the family the truth.
- Any leukaemia. The Harbin discovery is the proof that one kind is curable and the proof that it is not curable here.

What to do anyway: water, salt, warmth, position, company, honest words, whatever pain relief exists, and a written record so the next case is met better.

6. The case against

The strongest case against keeping any of this is made by Edzard Ernst, who built the field's adverse event literature and concluded that the benefits of acupuncture are small and the risks under-counted. His argument is not that the needle does nothing but that the margin over sham is so small, the trials so biased and the harms so poorly counted that the practice cannot be justified. Vickers, who produced the field's most favourable meta-analysis, supplied the ammunition himself in 1998 by showing that no trial published in China found a test treatment ineffective, and that 99.8 per cent of Chinese-language acupuncture trials report positive primary outcomes. A field whose evidence base is majority-Chinese and effectively 100 per cent positive is not an evidence base.

The sham problem cuts deeper than the bias problem. If a sham device beats an inert pill in the same patients, as Kaptchuk found, then what the trials record as the specific effect of acupuncture is the residue left after a powerful ritual has been subtracted from both arms, and the 0.2 standard deviation residue may be the least important part of the treatment. That is an argument for using acupuncture and against believing its theory.

Against the pharmacopoeia the case is simpler and stronger. A tradition that classified qinghao without noticing it cured malaria, that preferred for six centuries the species with less of the active compound, that still prescribes a Group 1 carcinogen under five different names, that kills by substitution because its own identification is unreliable, and that supplies a quarter of China's drug-induced liver injury, has shown that its selection method does not work. The strongest version is that artemisinin is evidence against the tradition rather than for it: the active plant sat in the formulary for sixteen centuries and the tradition could not find what it was good for.

The case for keeping anything rests on three narrow planks. PC6 for nausea works, equals a drug in trials, and costs nothing. Moxa at BL67 for breech works modestly, and after the Fall the alternative is a dead mother or a dead child. Acupuncture for chronic pain works a little and there will be nothing else. All three survive precisely because they do not depend on the theory being true.

7. Ten-line summary of robust findings

1. The tradition is a physiology of process, not an anatomy, and its clinical unit is the pattern, not the disease, which is its strength at the bedside and the reason its trials are malformed.
2. Project 523 began on 23 May 1967, screened more than 50,000 synthetic compounds and more than 40,000 herbs and compounds, and Tu Youyou's group read over 2,000 recipes and evaluated 640 to find one plant.
3. Ge Hong's fourth-century text supplied a plant name and a cold preparation and nothing else, and the classical indication was intermittent fever, not malaria.
4. Classical scholars preferred Artemisia apiacea, which holds less artemisinin, over A. annua, for six centuries.
5. PC6 stimulation reduces postoperative nausea, RR 0.68, and vomiting, RR 0.60, against sham across 59 trials and 7,667 patients, and equals antiemetic drugs.
6. Moxibustion at BL67 reduces non-cephalic presentation at birth, RR 0.87 against usual care and 0.74 against sham, 13 trials, 2,181 women, moderate certainty.
7. Acupuncture beats sham for chronic pain by about 0.2 standard deviations and no treatment by about 0.5, across 39 trials and 20,827 patients.

8. Aristolochic acid herbs were prescribed to more than a third of Taiwan's population from 1997 to 2003, are an IARC Group 1 carcinogen, and caused more than 100 Belgian cases by substitution.
9. Aconitine kills at about 2 mg, prolonged boiling cuts diester alkaloids 40 to 80 fold, and inadequate processing accounted for 13.5 per cent of a Hong Kong series.
10. Essentially every acupuncture trial published in China is positive, so the Chinese literature carries almost no information.

8. Contested and open questions

- Whether the wringing-out step in Ge Hong's recipe produces an emulsion that raises bioavailability remains, in Hsu's words, hypothetical and untested.
- Whether a traditional cold extraction of Artemisia apiacea has any antimalarial activity has never been tested, and Hsu says it should be.
- Whether moxibustion for breech works thermally or reflexly, and whether the effect survives in non-Chinese populations, is unsettled after the null Italian replication.
- Whether the small sham-controlled acupuncture effect is a needle effect or residual expectation is unresolved, and the finding that penetrating-needle shams give smaller differences points at the second.
- How many deaths and injuries the herbal pharmacopoeia causes annually anywhere is unknown, because no country counts them properly.
- Whether traditional aconite processing is reliable enough to teach to lay practitioners has not been studied, and the five Hong Kong cases of 2016 to 2017 at normal doses of properly processed fuzi suggest not.
- Nothing credible was found on how a practitioner can verify the identity of a dried root without a laboratory, which is the central practical question for this book.

9. Sources to read in full

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10. At the bedside after the Fall

A household. What is usable is acupressure and ginger. Pressure at PC6, two thumb-widths above the wrist crease between the two tendons, firmly, for several minutes, repeated, for nausea of any cause including pregnancy, seasickness, fever and injury. Ginger root, Zingiber officinale, grown or traded, about 1 g a day of dried root in divided doses, for nausea of pregnancy. Neither can harm anyone. The household needs nothing to start but the location of the point and the discipline to use it before reaching for anything swallowed. First failure to expect: the family will decide it has failed because it does not abolish nausea in one application, and will stop too soon.

A village of 300. What is usable is moxibustion. The village needs mugwort, Artemisia argyi where it grows or Artemisia vulgaris as the European substitute, gathered in early summer, dried in shade, stored at least a year, then rubbed and sifted to a wool and rolled in paper into sticks. It needs one person who knows BL67 and PC6 and who keeps a written register of every woman treated, the week of gestation, the number of sessions, and the presentation at birth. It needs a rule that moxa is used for breech from 33 weeks and for nothing else until the register says otherwise. If the village wants needles it needs a forge that can draw fine steel, a pressure cooker, and an absolute rule of autoclaving between every patient, because the Boston outbreak shows chemical soaking does not work. First failure to expect: a burn, because the stick was held too close, after which the women will refuse it. Train on a forearm first and teach the distance by sensation, warmth and not pain.

A district of 3,000. What is usable is a controlled materia medica. The district grows, identifies and labels a small number of plants, keeps dried voucher specimens so identity can be checked against a known sample, and keeps a written list of plants never to be used, headed by every Aristolochia and every Asarum. It supervises the processing of anything dangerous, and it may decide aconite is not worth the risk at all, which is defensible given that five Hong Kong patients were poisoned by correctly processed fuzi at normal doses. It trains the village healers, collects their registers, and is the only body that can notice a remedy is harming people, because no single village sees enough cases. First failure to expect: a substitution, because somebody's plant ran out and somebody else supplied a similar-looking root, which is how every documented aristolochic acid death happened.

What this tradition cannot give after the Fall. Artemisinin as a drug, because isolation needs solvent extraction and chromatography. Arsenic trioxide at a safe dose, because the therapeutic window needs measurement. Ephedrine, for the same reason with a worse margin. Any prepared patent medicine, because that supply chain is gone and was the main source of heavy metal poisoning anyway. Acupuncture anaesthesia for surgery, because it never worked.

11. Protocols

Protocol A. Acupressure at PC6 for nausea and vomiting. 1. Find the point. Lay three of the patient's own fingers across the inner forearm with the edge of the top finger on the wrist crease. The point is just beyond the third finger, on the midline, between the two tendons that stand up when the wrist is flexed. 2. Press with the thumb hard enough to be felt as a strong ache and not hard enough to hurt. Both wrists. 3. Hold 5 minutes each side, or apply steady pressure with a band and a small smooth bead over the point. 4. Repeat every 2 hours while nausea lasts, and before anything known to provoke it. 5. Tolerances: none that matter. The trials used a wide range of techniques and the point can be found within a thumb's width and still work. 6. Expected effect: about one third fewer episodes of nausea and vomiting. Not abolition. 7. Stop if the skin breaks or bruises. Do not use over a wound or rash.

Protocol B. Moxibustion at BL67 for breech presentation. 1. Confirm the presentation by abdominal palpation. The head is the hard round ballotable part. If it lies under the ribs and the softer breech is in the pelvis, the fetus is breech. 2. Start at 33 completed weeks and not later than 35. Earlier is better. Do not start after 37 weeks. 3. The point is at the outer corner of the little toenail, about 2 mm from the corner, both feet. 4. The woman sits or half-lies with the knee bent and the foot supported. A helper, or the woman herself, holds a lit moxa stick about 2 cm from the point, close enough for strong warmth and far enough never to burn. 5. Move the stick in a small circle and lift it away whenever the heat turns sharp. Keep water and a damp cloth beside you. 6. 15 minutes on one foot, then 15 on the other, 30 minutes a session. 7. Once daily for 7 days. If still breech, repeat for a further 7 days. Cardini's trial used twice daily for part of the cohort with no evidence of extra benefit. 8. Check the presentation by palpation at the end of each 7-day block. 9. Expected effect: the Cochrane pooling gives a risk ratio of 0.87 for non-cephalic presentation at birth against usual care, which with a 4 per cent breech rate at term means roughly one breech birth avoided for every two hundred women treated, and 0.74 against sham. Cardini's trial gave 75 against 48 per cent cephalic at 35 weeks. 10. Stop at once and do not resume if regular contractions begin, there is any bleeding or fluid loss, fetal movements fall away, or the skin blisters. 11. Do not use if the membranes have ruptured, there is bleeding, there is a known placenta praevia, or the pregnancy is a multiple.

Protocol C. Making moxa wool. 1. Gather mugwort leaves, Artemisia argyi or local Artemisia vulgaris, in early summer before flowering. Leaves only, no stems. 2. Dry in shade with air movement until they crumble between the fingers. Not in sun. 3. Store dry and closed for at least one year. One year is the minimum the 2024 study found adequate. 4. Rub the dried leaves between the palms or in a stone mortar until the green brittle matter breaks away from the pale fibre. 5. Sift through cloth or fine screen. Discard powder and stem. Repeat rubbing and sifting several times until what remains is a pale, soft, even wool. 6. For sticks, roll the wool firmly in a paper strip about 20 cm long and 1.5 cm thick and twist the ends. For cones, pinch the wool into a cone between the size of a rice grain and a date stone. 7. Tolerance: purer wool burns cooler and more evenly. Coarse wool spits sparks, and sparks cause the burns.

Protocol D. Needles, if the village uses them at all. 1. Needles must be steel fine enough to bend rather than tear, drawn and polished at a forge, with no burr. 2. Between every single patient, wash mechanically with soap and water until no matter is visible, then autoclave in a pressure cooker at full pressure for not less than 20 minutes. Chemical soaking does not work: hepatitis B survived an overnight benzalkonium soak and infected 6 of 103 patients in the Boston outbreak. 3. Never needle deeply over the chest, the upper back between the shoulder blades, or above the collarbone. That is where the pneumothorax deaths come from. 4. Never needle through broken, burned or infected skin. 5. Count the needles in and count them out. 6. If a patient becomes suddenly breathless with chest pain during or after treatment, stop, sit them up, keep them still. There is nothing else the village can do.

Protocol E. The rejection list, to be copied and posted. 1. Never use any plant of the genus Aristolochia under any name, including guang fang ji, guan mu tong, ma dou ling, tian xian teng and qing mu xiang. Never use Asarum, wild ginger, xi xin. 2. Never use cinnabar, realgar, or any mineral medicine containing mercury, arsenic or lead. 3. Never use rhino horn, tiger bone, pangolin scale or bear bile. 4. Never use raw unprocessed aconite of any species. If processed aconite is used at all it must be boiled not less than 2 hours before any other ingredient is added, the dose must not exceed 3 g of chuanwu or 15 g of fuzi, and it must never go to a pregnant woman, a child, an old person, or anyone with an irregular pulse or recent fluid loss. 5. Never give ma huang, Ephedra, for weight, for energy, or to anyone with a fast or irregular pulse, high blood pressure or pregnancy. 6. Never substitute one root for another because the first ran out.

12. Numbers to carry

1. **2 mg** of aconitine kills an adult and about **0.2 mg** poisons one. Boil processed aconite **2 hours** before adding anything else.
2. **33 to 35 weeks** is the window for moxa at BL67, **15 minutes each foot for 7 days**, repeated once.
3. **PC6 is three of the patient's own fingers above the wrist crease**, between the tendons, and cuts nausea by about **a third**.
4. **0.2 standard deviations** is acupuncture's advantage over sham for chronic pain, and **0.5** over no treatment.
5. **NNT 4** for halving migraine frequency with acupuncture against no acupuncture.
6. **Zero.** The number of Chinese-published trials finding acupuncture ineffective in the 1966 to 1995 review, and 2 of 840 in a later Chinese-journal review.
7. **More than one third** of Taiwan's population was prescribed aristolochic acid herbs between 1997 and 2003, and the standardised incidence ratio for upper tract urothelial cancer among its dialysis patients was **11.6**.
8. **20 to 27 hours.** How long hepatitis B stayed infectious on acupuncture needles after an overnight chemical soak. Autoclave or do not reuse.
9. **One plant out of 2,000 recipes and 640 evaluated** is what the largest systematic mining of this tradition produced.
10. **26.8 per cent** of China's drug-induced liver injury cases, across 25,927 cases from 308 centres, were attributed to traditional medicines and supplements.

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