Resilience of South Asian disabling conditions: a glimpse of lathyrism among comparative histories

M. Miles

West Midlands, UK

E-mail: m99miles@hotmail.com

Some disabling conditions in South Asia, such as lathyrism, iodine deficiency disorders (IDD), cataract, poliomyelitis, epilepsy and leprosy, have mechanisms and impairment effects that differ substantially. Yet they share socio-cultural features that have promoted their strong resilience in face of efforts to eliminate them as public health problems. For each condition a 'magic bullet' or much-improved technical fix has been applied, often with increasing vigour over decades. Successes are reported in some regions during some periods (so far as genuine data can be distinguished from data adjusted to fit externally-prescribed 'targets'). Yet the longer view is that 'vertical' applications of a seemingly effective fix are not enough, without concurrent broad and long-term measures for poverty alleviation, community health education, and local self-help. The widespread resurgence of malaria and tuberculosis warns that none of these diseases or conditions is beaten. None can be relegated to low-profile 'mopping up' work. The eradication of smallpox may have been seriously misleading.

Such a hypothesis was examined recently with focus on leprosy, comparing evidence from the public careers of other major disabling conditions including lathyrism (15). The idea was that the stigma and separateness of the 'leprosy world' has been self-reinforcing, and obscured some common factors. People involved with each disability-related condition have something to learn from history and from one another, though the precise biomedical focus may be dissimilar. There is nothing new in taking a broader comparative view. In the 1920s, disabling ailments such as goitre, rickets and lathyrism were mapped together, across South Asia, for epidemiological purposes (13). The historical background of lathyrism in South Asia, and socio-cultural features foreshadowed there, are reproduced here to contribute to an appraisal of the broader picture.

Evidence of Lathyrus sativus (grass pea or chickling vetch) cultivation has been found in Indian archaeological sites from the second millennium BC (17). A physical impairment attributed to eating khesari dal (the Indian food name of this pulse) was described in the period 200 BC - 200 CE, in Susruta's Nidanasthana: "When there is trembling in taking the first few steps with limping and when organisation of the joint gets loose, it is known as Kalayakhanja [Footnote: Kalaya -- Khesari pulse.]", though some translators are cautious about identifying lathyrism here (20,23). The condition is mentioned in South Asian writing in the late 16th century, in the Bhavaprakasa of Bhavamisra, and in Abul Fazal's Ain-i-Akbari (1,23). The latter notes that, "Kisari is the name of a pulse, resembling peas, eaten by the poor, but is unwholesome", with footnote on Kisari as Lathyrus sativus. Symptoms were more precisely described by the physician and surveyor Francis Buchanan reporting on Bihar and Patna in 1811-1812: "It seems to consist in a weakness and irregular motion of the muscles moving the knees, which are bent and moved with a tremulous irregular motion, somewhat as in the chorea, but not so violent. When the disease has lasted some time, and has become confirmed, the legs suffer emaciation. It is not accompanied by fever, but in the commencement is often, though not always, attended with pain" (4).

The first institutional service for lathyrism sufferers was probably the Mejah Cripples' Asylum (Allahabad, India), maintained "by the charity of the local rajas and land-holders under the supervision of the Tahsildar" (21). Some blind inmates and some with leprosy were also listed, but this asylum arose mainly...
to care for sufferers from lathyrism, affecting an estimated 4% of the local population in 1861. Between 1859 and 1868, the *Indian Annals of Medical Science* carried four detailed papers by James Irving, Civil Surgeon, Allahabad, reporting this cumulative disaster. He found it "remarkable that thousands of people, who know that a particular grain may render them lame, yet continue to use it for food. Is this because they must either eat the poison or starve? Will no other grain grow and be productive in the affected areas? If not at present - will drainage or other means not render the soil capable of bearing other and less deleterious crops? Are there no means, in fact, of inducing the people to give up the use of the poisonous food?" (10). Forty years later, Irving's questions were still unanswered. The government commissioned an enquiry into lathyrism, by Major Andrew Buchanan (6). He duly reported, and the report was approved and filed away. A few years later it was practically unknown and unobtainable (22).

Sixty years after Irving's questions, the social problems were underlined by a senior pathologist, Major Hugh Acton. He went upcountry from Calcutta to examine 204 people with lathyrism, who were breaking limestone at a kiln. Acton estimated that 60,000 people had lathyrism in North Rewah alone, many of whom "migrate to the larger cities, Patna, Benares, Bombay and Calcutta, and form a large percentage of the beggar population" (2). Acton was a hard-boiled military scientist, sceptical of anything not viewable on a microscope slide; yet he concluded that the solution to lathyrism must be "a sociological one", starting with abolition of the rural debt-slavery that forced workers to accept risky food in lieu of wages. Sixty more years down the line, Dr Gopalan of the Nutrition Foundation of India noted that the Indian government in the 1950s had tried to ban the payment of *Lathyrus sativus* to agricultural workers in lieu of cash, and to dissuade rural folk from excessive consumption of kesari dal. These efforts "had no impact whatever" (7).

Gopalan was publishing on lathyrism as early as 1950. In a remarkable turn, he noted in 1999 that lathyrism had now practically disappeared from some Indian regions where it was long endemic -- not because of any direct technical advance, but because "Green Revolution" investment in wheat and rice has reduced their price, while that of *Lathyrus sativus* (still widely grown) has risen sharply. "Evidently, the poor landless labourers were being 'saved' from the poisonous seed not because of the researches and educational programme of the last two decades, but solely due to the intervention of market forces. The very greed and profit motive of the landed gentry, which for centuries was responsible for the perpetuation of neurolathyrism among the poor of Rewa, has apparently helped to redeem the poor by putting *Lathyrus sativus* out of their economic reach" (8).

During the 1990s, researchers made laudable technical progress in breeding and testing types of *Lathyrus sativus* with the neurotoxin significantly reduced, while retaining the plant's remarkable capacity to flourish in barren conditions. Yet there remain complex tasks of promoting the new breeds, re-orienting the centuries-long folk awareness of lathyrism dangers, organising distribution networks so that the new seeds are used by hundreds of thousands of subsistence farmers scattered across South and West Asia and the Horn of Africa, and monitoring the feeding outcomes with humans and livestock. Technically this process could perhaps succeed in less than ten years; yet agricultural realities, and the imminent prospect of water catastrophes in the region, suggest that some decades may pass before the benefits of current research reach those needing them.

Availability of research funding for technical advances may depend more on the commercial potential of the grass pea as a strong, high-protein crop, than the protection of subsistence farmers from paralysis. Health and nutrition development for rural people tends to be long, slow and of doubtful outcome, unless people see a sure and tangible gain for themselves, without drawbacks. The uncertainty factors can be verified from experiences in the cataract surgery field. The offer of 'eyesight regained' should be overwhelmingly attractive; yet hundreds of thousands of South Asians, within reach of low-cost cataract surgery, do not avail themselves of it. There are deep-rooted folk memories of 'development' and 'new methods' which turned out to have unexpected costs and pains. So what could be the drawbacks of 'new *Lathyrus sativus*'? One predictable irony of history could occur if, in 30 years time, lathyrism has been eliminated and a million Asian farmers have lost their smallholdings to agrobusinesses that mass-produce the toxin-free crop with minimal need of
human labour. There is more than one way to cripple a community, even with the most benevolent intentions.

For further comparison, Gopalan notes "unforeseen factors" introduced by technological intervention, which are moving IDD nearer to the children of urban planners. Iodine deficiency, once considered a hill country problem, has been increasing in the densely populated plains of India. This may arise from intensive irrigation and multiple cropping, resulting in the depletion of soil micronutrients, plus food additives and contaminants that boost goitrogen or reduce body utilisation of iodine (8). Since no microbe works in a vacuum, no body lives solely in a laboratory, efforts are needed to 'foresee the unforeseen', without resort to astrology.

Meanwhile, some Afghans still suffer lathyrism, unseen by modern health services. *Lathyrus sativus* has been cultivated in many parts of Afghanistan (5), and lathyrism seems to have been noticed in 1839, when Indian soldiers on a British military expedition to Kabul (probably via the Bolan Pass, Kandahar and Ghazni) suffered physical harm after being reduced to minimal food rations. To survive, they had supplemented their diet with *khesari dal*, though they knew the risks (10). Modern reports of lathyrism in Afghanistan appeared in 1953 and 1988, at Kabul (16,17). In 1999, a medical team visiting Afghanistan's north-eastern "Wakhan corridor", reported lathyrism endemic in several villages (19). The corridor runs north of Chitral and Gilgit in Pakistan, where in 1908 McCarrison found ten cases of lathyrism, all male, among a village population of 101, and Mackenzie reported further cases (11,12).

The timescale for rural change is usually long, but not all the inertia and delay can be blamed on villagers. International action in translating scientific discovery to practical effect, e.g. on iodisation, smallpox vaccination, polio immunisation, or detoxifying lathyrus, is also painfully slow-moving. Coindet published the effective use of iodine against goitre in 1820, and by 1825 iodine was being applied successfully by David Scott, District Commissioner and amateur physician, in a remote area of Bengal (18). Yet prophylactic iodisation of salt took another 160 years to start being taken seriously in South Asia, and is still pursued in a half-hearted way. In the specific region where Scott made the first move, goitre remains endemic. Nearly half the Bangladesh population reportedly had goitres in 1993, though by 2000 this dropped below 20% (9,14).

Major Acton in 1922 proposed an evidence-based plan of action against lathyrism, but lamented that "In India one publishes results and waits patiently for years to see them carried out into practice." (2). His comment could draw a grimace of recognition from scientists and development agents in any country at any time during the following eighty years. The historical lesson is that technical fixes alone are seldom sufficient. Concerted and sustained action is needed on many fronts and at many levels to address issues of poverty and exploitation, and to enlighten planners as well as the masses.

References