The Work of Wallace Aykroyd: International Nutritionist and Author

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Wallace Ruddell Aykroyd (1899–1979) had an English father, whose business was in Ireland, and an Irish mother. He attended high school in England as a boarder and then joined the Royal Air Force. After the end of World War I he returned to Ireland for medical studies at Trinity College, Dublin (1,2). In 1924 he graduated as Bachelor of Medicine and also received the Vice-Chancellor’s Prize for English Prose. We will continue to see how he used his abilities in both areas.

Vitamin Deficiencies in Newfoundland, 1926–1930

After gaining experience in hospitals in Dublin, Aykroyd received an appointment at the general hospital in St John’s, Newfoundland. He was surprised to see evidence of widespread vitamin A deficiency there and estimated that a quarter of the population had suffered from night blindness at some time. Newfoundland had a flourishing cod fishery, and cod liver oil was one of its manufactures. As he wrote: “It is ironical that people who supply a great part of the world with vitamin A should suffer from a lack of it themselves” (3). However, the winter diet of isolated farmers and fishermen was limited to what they could afford to buy in advance. There was very little game available, and we can see now that they consumed very little of either the preformed vitamin or carotenoids. They knew the value of eating liver as a remedy for night blindness, but preferred birds’ livers, and regarded fish as something to be sold rather than eaten.

From his 2 y of experience with vitamin A deficiency, Aykroyd prepared a thesis for the M.D. degree. This was not required in Ireland or in Britain for ordinary medical practice but was expected for those going on to teaching or academic work. It appears that one of his examiners was Charles Martin, Director of London’s Lister Institute, which was then an important center for vitamin research. Martin was impressed and arranged for Aykroyd to receive a grant for 3 y of full-time research. Part of this time he spent at the Institute working with colleagues who were trying to sort out the components of the vitamin B complex, and which, in particular, was responsible for the prevention of pellagra. He also carried out biological assays for the vitamin B-1 potencies of rice processed in different ways, which we which will return to later.

However, of most interest now is the paper that resulted from Aykroyd’s return to Newfoundland to gain a better understanding of why beriberi had also been a continuing problem there (4). Beriberi has always been thought of as a disease typically of poor Asian laborers living on white rice and not much else, and it was in the Far East that workers such as Kanehiro Takaki (1849–1920) in Japan and Christiaan Eijkman (1858–1930) and Gerrit Grijns (1865–1944) in Indonesia first showed it to be caused by a deficiency in the diet. Although it was generally considered a rice-eaters’ disease, there were also reports of beriberi appearing among fishermen in Newfoundland and Labrador since the 1880s (5).

Because of the harsh winters in that part of the world, families living in “outports” (small harbors along the northern coast where the sea froze during the winter) had to buy winter supplies in advance, insofar as they could expect to be cut off for about 6 mo. These supplies consisted mainly of white wheat flour, margarine, molasses, and tea, together with salt meat to the extent that they could afford it. There was no use of dairy products. They might also buy some potatoes and beans or peas, but these would not last through the winter, and it was at the end of winter that most cases of beriberi were seen at the hospital in North Newfoundland. In addition, in late summer, families would typically pick a large barrel-full [~91 kg (200 lb)] of wild cranberries and cloudberries that would last through the winter, and this was probably responsible for keeping them free from scurvy (4).

As in Asia, the first symptom of beriberi was usually weakness in the legs with either lack of feeling or aching pain. In a few people, it began with shortness of breath and a feeling of constriction across the chest. The heartbeat was fast and blood pressure low. Less than a third of hospitalized cases showed edema. Although it was a fairly common disease among a population of 250,000, there were only 84 deaths from it recorded in the decade from 1912–22. Only one-fifth of the cases were in women, which were usually associated with pregnancy and appeared suddenly after labor. The disease was also rare among children under 16 y of age. Aykroyd showed that the sex and age patterns for the disease were similar to those recorded in...
both Japan and in an area of India and did not seem to be explained by a difference in diet between men and women (4).

Although crystals of what was later to be called thiamin had been isolated by Dutch workers in 1926, there was no pure vitamin available for clinical use at the time of Aykroyd’s study. The standard hospital treatment was a diet of whole-wheat bread, milk, eggs, beans, peas, and cabbages. With this regime patients could usually be discharged within 6–8 wk.

Aykroyd made records of the winter food consumption of families. He concluded that the poorest were most at risk, which agreed with statistics showing that it was after years of poor fishing, when resources were most strained, that more cases occurred. He recorded the winter diets of 13 families in which at least one person from each family developed beriberi. There was no way then of estimating their thiamin content, but I have attempted to do so using later published analyses. There are some problems because he gives only the total supply of salt beef and pork, and we know that pork is much richer in the vitamin; and he also gives only the total of bread and biscuits, although the biscuit, if baked with soda, loses most of its thiamin, whereas bread baked with yeast does not. However, it does appear that these diets would have contributed <1 mg thiamin per day, and this is well below the recommended allowance (5). However, calculations of the vitamin contributed by the diets eaten by 12 families that remained free from beriberi indicated a higher intake of the vitamin. In particular, these diets nearly all included considerably more potatoes.

Aykroyd wrote that attempts for many years to persuade people to improve their diets by buying whole-meal rather than white flour had been unsuccessful, and he thought that this was due, at least in part, to the fact that the former deteriorates more quickly during storage. He believed that increasing prosperity would solve what was basically an economic problem because it would allow families to buy a more varied assortment of winter supplies that appealed to them as well as being more nutritious (5).


The League of Nations, set up after WWI, can be thought of as the precursor to the United Nations Organization, although more restricted in scope. It did, however, have a small Health Secretariat based in Switzerland, and in 1931, Aykroyd was recruited to be its first nutritionist, perhaps the first position ever to be specifically designed to include international responsibilities for nutritional advice.

This was a time characterized by “The Great Depression” and, although it started in the United States with a Wall Street crash, the effects on European economies were comparable to those in the U.S. Not surprisingly, much of the work of the small team that Aykroyd joined was to study the effect of mass unemployment on public health, using data collected principally in Germany prior to Hitler seizing power. It was concluded that the family of an unemployed man could just about remain adequately fed if his wife shopped very prudently and all other expenses were pared down so that 60–70% of the government allowance could be spent on food (6).

Many European governments were already trying to improve the nutrition of children by supplying free or subsidized school meals and/or milk. There were still questions as to whether pasteurization destroyed some of the nutrients in milk and whether skimmed milk could be used as a cheaper substitute. The findings from trials on this subject were summarized in a further article for which Aykroyd is listed as coauthor with his colleague, Etienne Burnet (7). There was general agreement that every kind of milk was equally effective in increasing height and weight gains of children, and also their general vigor and mischief making (7).

For calculations as to the adequacy of low-income diets, a lot depended on the nutritional standards that were being used. Attempts were made to obtain international agreements, and another part of Aykroyd’s work was to organize international meetings of experts at which he served as technical secretary. The problems were also tackled in an article with Etienne Burnet. It includes some wry comments that can still “hit home.” The section on protein requirements includes the following: “There is no existing ‘standard of protein intake’ that is based on the sure ground of experimental evidence. During the two extremes of a very high and a very low protein intake it is difficult to prove that one level of intake is preferable to another” and “Physiologists, in drawing up dietary standards, are largely influenced by the dietary habits of their time and country” (7).

In the section on psychological aspects of the problems of dietetics, we read:

> One of the commonest dietary superstitions of the day is a belief in instinct as a guide to dietary excellence … with a corollary that the diets of primitive people are superior to diets approved by science … [and even] that light might be thrown on the problems of human nutrition by study of what chimpanzees eat in their native forests…. Such notions are derivative of the eighteenth-century fiction of the happy and noble savage. (7)

One can only guess that these are Aykroyd’s comments, reflecting his wide reading and literary interests. These are also in evidence in the interesting book that he wrote in his spare time during his 4 y in Geneva (8). Entitled Three Philosophers, the subjects of the book were 3 extraordinary eighteenth-century innovators whom we would today call “scientists.” The first was Henry Cavendish (1731–1810), an aristocrat whose mother died when he was only 2 y of age; he received a strict education and little in the way of an allowance until he was in his forties, when an uncle who had felt sorry for him made him one of the richest men in London. However, he remained a recluse, working alone in his home laboratory, and he was the first to show that water was produced by the combination of hydrogen and oxygen. The second was Joseph Priestley (1733–1804), a religious “dissenter” debarred from attending a university. He became first a preacher and then a schoolmaster, but his pleasure was experimentation, and when he moved to a position near a brewery, he began to study the “fixed air” (i.e., carbon dioxide) produced by fermentation. He extended his studies to other gases and was the first to prepare and study the properties of oxygen, “an air in which a candle burnt better than in common air.”

But the real hero of Aykroyd’s book was the Frenchman Antoine-Laurent Lavoisier (1743–1794) who repeated Priestley’s experiments with oxygen and went much further in showing the true nature of combustion in general, disproving the “phlogiston” theory, and then reorganizing chemistry in terms of the elements and clarifying its terminology. As he wrote, “[i]deas are preserved and communicated by words, and they have to be connected with a general and rational system” (8). He also did pioneering work of direct relevance to nutrition and showed, by direct calorimetry, that “animal heat” could be explained by the combustion of nutrients in the tissues, and he demonstrated that food requirements, as estimated from oxygen consumption,
were increased by physical labor, so that the poor workman needed more food than the aristocrat (8).

Tragically, Lavoisier was sentenced to death on the guillotine at the height of his fame during the Reign of Terror in 1794, after his judge had said (supposedly) that the French revolution had no need of intellectuals. This was the result of his marriage into another wealthy family where part of his bride’s dowry was a share in the French tax collection business that was to occupy a great deal of his time from then on. The tax “farmers,” as they were known, were considered villains by the masses, and their leaders were all put to death during the “Terror.” Aykroyd explained that it was his great admiration for Lavoisier that led him to write the book (8).

Nutrition Research in India, 1935–1945

In 1935, Aykroyd was appointed Director of the government’s nutritional research center in India, which was pleasantly situated in Coonoor in the south. One of his first projects was to round off a study of pellagra begun earlier. He had visited an area of Romania where pellagra was a serious problem each spring and confirmed that the staple grain in use was whole corn that had not been degermed (9). By the time he reached India, the antipellagra vitamin had been identified as nicotinic acid, and his new colleague, Swaminathan, was able to use the recently developed procedure for its determination in foods. What they found was paradoxical: the pellagragenic Romanian diet based on corn apparently contained a higher level of nicotinic acid than typical “poor Indian diets,” which were based on white rice that did not induce pellagra (10). Interestingly, it would be another 10 y before the discoveries that tryptophan (at a low level in corn proteins) was another antipellagra factor, and that, on mature grains, the vitamin had low bioavailability unless the grains were processed with alkali.

Aykroyd’s main task was to determine the nature of the nutritional problems in India’s huge and generally poverty-stricken populations, and to develop affordable recommendations for improving their status. To this end, he expanded the laboratory and his team began systematic analyses of Indian foodstuffs and nutritional surveys where they had been most lacking. A survey of volumes 24–28 of the Indian Journal for Medical Research shows how active they became.

For example, he and B. G. Krishnan carried out a study in a residential hostel for 120 boys 11 to 15–y–old. Their diet, based on parboiled rice and millet, was typical or slightly better than that of the poorer classes in many parts of India but contained no milk. For 3 mo, half the boys received 28 g (1 oz) skim milk powder daily reconstituted with 225 mL (8 oz) water, and the others received supplementary millet to balance their overall energy intakes. For the following 3 mo, the treatments were reversed. In each period, those receiving skim milk gained, on average, >0.9 kg (2 lb) more in weight and 6 mm (0.25 in) in height, both statistically significant differences, and also appeared healthier (11).

Unfortunately, even this relatively inexpensive form of milk, if adopted permanently, would have increased costs for food and drink by >25% and would have exceeded the hostel’s budget. A cheaper supplement of soybeans, contributing the same extra protein as the milk powder and tested in a similar study in a girls’ hostel, unfortunately showed no benefit (11). Lastly, they compared the responses to a small (1 g) daily supplement of calcium lactate with that of reconstituted skimmed milk in another boys’ school. The calcium salt was given with a peppermint, and the controls received just the peppermint. Over the 11-wk trial, both supplemented groups showed increased gains in weight and height, with a significantly higher weight gain for the milk group; the overall impression of the subjects’ general health was also better (12).

Aykroyd’s largest review, prepared with 3 colleagues, was on what was entitled “The Rice Problem in India” (13). Rice was the predominant item of the diet in many parts of the country. In rural areas of Bengal, rice provided >85% of the total energy intake. The way it was processed before being eaten was already known to be of critical importance in determining whether the consumers were at risk of developing beriberi, one of the diseases that Aykroyd had already become familiar with in Newfoundland.

Rice, as harvested, still has each grain surrounded by a husk and is known as paddy. In Asia, the traditional way to separate the indigestible husk was to place some 0.9 kg (2 lb) of paddy at a time in a mortar and then pound it with a heavy wooden pole. The husk fragments could then be separated by winnowing. Village women could prepare enough rice each day for their family in an hour’s work.

However, in most of the rice-growing areas of India, a preliminary step was developed called parboiling, in which paddy was soaked, steamed or boiled, and finally sundried. This makes the husk easier to remove, with less labor and fewer of the grains fragmenting. Whether parboiled or not, the dehusked material is now brown rice and can be cooked and eaten as such. However, with the development of machine milling, the brown rice could be further polished to remove the pericarp (the thin branny outer layers of the grain) and the germ. The product, white rice, had better keeping qualities in the tropics because most of the oil had been removed, was smoother to the taste, and had become the standard choice in urban areas (5).

The obvious problem in other parts of Asia, where white rice had become the staple and the diet had only small quantities of other foodstuffs, was its association with beriberi. But in India, beriberi did not occur in the areas where parboiling was practiced, but only in a relatively small area along the east coast where white rice was prepared without a preliminary parboiling. Braddon, from his experience in Malaysia, had, by 1907, recorded that parboiled rice prepared for immigrants from India seemed to protect them from beriberi (14).

Aykroyd, while working in London, showed with rat assays that steaming caused the “antineuritic activity” to diffuse toward the center of each grain (15). They were now able to confirm this finding, having the pure vitamin (thiamin) and being able to determine its level in foods (13). There is agreement between the 2 sets of data, confirming that the vitamin is concentrated in the external pericarp and germ, but that much of it diffuses into the interior of the grain during the soaking stage of the parboiling procedure, so that less of it is lost during subsequent milling. This was a fortunate happenstance because the procedure was presumably developed originally only because it simplified dehusking. Unfortunately, parboiling also changes the flavor of rice and it is generally disliked by those who have not grown up with it.

Other studies have found that as much as one-half of the vitamin remaining in white rice is lost when it is washed extensively before cooking and another half of the remaining vitamin can be lost into the cooking water if an excess is used (13).

Their final recommendations are interesting. Although others had been urging the selective breeding of rice with an increased content of protein and other nutrients, they believed that the need for protein had been exaggerated and that any changes in composition were likely to be small, so that it was more
important to concentrate on the production of high-yielding strains. (This was, of course, long before genetic engineering had been developed.) Parboiling should receive every encouragement, and it was unfortunate that Brahmans (respected members of the highest religious caste) regarded parboiled rice as possibly “polluted.”

However, it seemed useless to try to persuade people to go back to the work of hand pounding wherever white rice was readily available at an economic price. So long as it had been prepared from parboiled grains, even white rice could still serve as a protection from beriberi, particularly if people could be educated not to over wash the rice before cooking and then to use a minimal amount of cooking water, because losses at these final stages of preparation could be critical. It should be possible, moreover, to legislate that machine milling be minimized to “once polishing.” This should provide a pleasing product with a reasonable storage life and an adequate quantity of the vitamin.

The supplementation of poor children’s diets with skimmed milk was certainly desirable but, where cost made it impractical, giving calcium salts was better than nothing and was affordable. It would also help to encourage the use of millet as a replacement for rice because it is more nutritious and at least as cheap, although it was unfortunately looked down upon as “prisoners’ food.” The greater production of pulses (as a source of extra protein) and of green vegetables (for their vitamin A activity) should also be encouraged. And, domestically produced shark liver oil could replace relatively expensive imported cod liver oil (13).

In 1943, Aykroyd was away representing India at the important Hot Springs Conference in Virginia, called by President Roosevelt to plan for international problems of food supplies in the postwar world. The basic planning was laid here for the formation of the FAO in which Aykroyd would also play an important role (1).

The Bengal Famine, 1943–1944

In July 1944 Aykroyd was again called away from Coonoor, this time to join the 5-man commission appointed to investigate and report on the causes of a terrible famine in Bengal from late 1943 to the first half of 1944. Three of the others were Indian, and the fifth was a retired British civil servant. It had become a subject of bitter controversy as to whether a more caring government could have averted, or at least mitigated, the tragedy. The Commission convened in July 1944 and continued to travel together and interview over 200 witnesses for the next 4 mo before preparing their report. (16). They first had to familiarize themselves with the normal conditions in the area before investigating what had recently gone so wrong.

The province of Bengal, at the northeast corner of India, then included to its east the area of what is now the independent country, Bangladesh. As the Commission reported, the entire area had a population >60 million, most living in villages where there was a shortage of usable land and the standard of living was generally low. However, some 4 million lived in the commercial and industrial districts of greater Calcutta in the south.

India had historically been subject to localized famines as a consequence of droughts and subsequent crop failures. However, the last serious famine was in 1907–08, and it had been hoped that, with improved transportation, famines were a thing of the past. Bengal was never subject to serious droughts, although there was a cyclone in 1942 that killed nearly 15,000 and caused widespread damage. With the population rapidly increasing, the Bengalese came to rely on annual imports of nearly a million tons of additional rice from Burma.

Japan invaded Malaysia in 1941 and, in the following year, Burma too was overrun, and Bengal’s rice imports ceased. In addition, refugees and large army units in Bengal consumed additional food. In 1943 the price of rice rose to 10 times its normal level, which put it beyond the means of the poor. As a consequence, there were some 2 million deaths, either from direct starvation or the effect of epidemics of malaria and cholera on a weakened population.

One special problem for Bengal was that the population was divided by religion with just over one-half Muslims (mainly in the east), and most of the remainder Hindus, particularly in Calcutta. Congress, the main national Hindu political party, refused to take any part in the government of the provinces until India obtained complete independence and was pressing its “Quit India Now” movement against the British, and many of their leaders were imprisoned as a consequence. The provincial ministry in 1943 was therefore solely in the hands of the Muslim League, with the British governor still having the reserve power to overrule it if he thought it essential, and Congress being unwilling to collaborate in easing the problems (17).

Transport within the province was also made physically difficult by the great number of rivers, with the widest of them without bridges. There was therefore considerable reliance on transportation by boats, and, in 1943, many of these had been commandeered to avoid capture in a Japanese invasion.

The business situation in India was one of private enterprise and, in the case of rice, complex distribution lines had grown up and worked well. It was in the self-interest of merchants to transport supplies to locations with a relative shortage and, as the price accordingly increased, to keep some stocks in reserve against future shortages. However, there were no statistics that could be used to assess the extent of overall rice stocks that were being carried over from one harvest to the next.

In 1942 the central government decided that, under wartime conditions, control of food distribution might become necessary and, as a first step, forbade the transfer of main crops from one province to another, as this was the point at which movements could be most easily monitored. They then intended, as necessary, to direct interprovince transfers. However, this immediately affected the Calcutta rice merchants who were used to buying rice from Bihar province immediately to the south, and precipitated a crisis. Those running war-related industries in the area began buying up rice, more-or-less regardless of price, so that they could obtain a reserve to distribute to their workers who would remain well fed and productive, even if rice became in short supply and too expensive for others. In 1943 the central government tried to order stores to be released by merchants at fixed prices, but most went underground and shortages worsened, so the government allowed free trade to return at even higher prices.

Meanwhile, as many as 100,000 starving villagers had somehow made their way into Calcutta, in the hope of finding relief there, and were dying in the streets. In October 1943 Archibald Wavell, an earlier British war hero, was appointed Viceroy and intervened vigorously, ordering the military to take over responsibility for transporting rice to the country areas of Bengal and ordering the establishment of relief kitchens. And, with the next harvest being a bumper one, the crisis was eased.

The Commission concluded that one could have either a completely free system or a completely controlled one, with stocks solely in the hands of the government and the rice distributed by rationing according to need. But what caused chaos in Bengal was to have only partial and intermittent controls. Aykroyd later described the Commission’s questioning...
as having revealed an ugly story of bungling and greed, the latter because of the hoarding and profiteering from exorbitant prices for rice “with rapacious Bengali dealers caring nothing for the hunger of other Bengalis.” It was estimated that there were excess profits equivalent to −$200 for every life lost (18).


Aykroyd was one of the first to be invited, in 1946, to join the staff of the newly constituted Food and Agriculture Organization of the United Nations (FAO) as head of the Nutrition Division. The FAO moved to Rome in 1951 and continued its expansion; the Nutrition Division itself grew from 3 members initially to 88 by 1960 (1). In 1952, FAO recorded “considerable concern that food production over large areas of the world was not keeping pace with the growth of population [and] ... that progress generally remained slowest in the major food-deficient nations of the world” (19).

After the WHO had been founded, Aykroyd played a large role in building collaboration between their nutrition programs; his own M.D. degree probably helped the WHO feel that he was “one of them.” As the FAO’s own committee stated in 1948, “Nutrition is a single whole which cannot be broken into separate and distinct categories... Almost every practical program of nutrition has aspects which fall within the fields of interest of both FAO and WHO” and, from then on, a joint FAO/WHO Expert Committee on Nutrition was set up to oversee the work of both organizations (1). Most of Aykroyd’s work during this period was behind the scenes as de facto leader of the planning done by this committee.

However, he did join the team that revisited Newfoundland to investigate whether recent changes there had extinguished the vitamin deficiencies that he had studied earlier in his career. Since then, there was compulsory enrichment of white flour with thiamin and riboflavin as well as a general increase in prosperity. The team reported that there was no longer any sign of beriberi but warned that the improved intake of thiamin depended to a great extent on the current high consumption of bread (20).

A few years later, Aykroyd was involved in a dispute with Robert R. Williams (1886–1965) who was characterized in a biographical sketch in the Journal of Nutrition as “a dedicated, determined and often stubborn man who generated tremendous enthusiasm among his followers and considerable antagonism in some of his peers” (21). As a young chemist working in the Philippines before WWI, he assisted Edward Vedder (1878–1952) in the preparation of vitamin-rich extracts of rice bran for the treatment of infantile beriberi and, when American staff were replaced by Filipinos, he was determined to continue this line of work in the U.S. during his free time, at first in his garage with his wife’s washing machine. Finally, with the collaboration of the Merck Company, he was able to isolate and determine the structure of thiamin and to patent its synthesis. An almost unbelievable story! With the ensuing royalties, he financed many nutritional studies through the Williams-Waterman Fund, and he was also able to proceed with his own long-term goal of enriching white rice in the Philippines in the hope of eliminating beriberi there.

Because rice was consumed in the form of whole grains, enrichment raised special problems. With wheat flour, a powdered vitamin concentrate could be blended with the flour without special difficulty. With rice, it was necessary to prepare vitamin-rich pills that had the appearance of rice grains; these could then be blended with white rice as it was produced at the many small village mills in use there. In a 2-y preliminary trial in one province, with the “pills” provided to the millers free of charge, there was good evidence of a reduction in sickness and death from beriberi compared with an adjacent “control” province (5,22).

Williams believed this was all the evidence needed for the Philippine government to make enrichment compulsory throughout the country; in addition he asked FAO and WHO to send a team to study the results on the spot. Unfortunately, there was a 2-y delay in the arrival of such a team because of an insurgency in the country, and by this time the millers resisted buying vitamin pills after their free issue had ceased. The final FAO/WHO report was, to Williams’ surprise and disgust, quite critical of his approach to the problem and the practicality of supervising what went on in remote mills. Aykroyd’s opposite number in WHO was R. C. Burgess, an Englishman who had been interned in a Japanese prison camp in Singapore and had first-hand experience of different measures used to reduce the incidence of vitamin deficiencies under those conditions. He and Aykroyd chose to add the combined authority of the two UN organizations by endorsing the report with their own introduction (23). Williams described their attitude as biased and anti-American because they disliked the idea of Merck profiting from the sale of the vitamin (5,22).

London School of Hygiene, 1960–1967

In 1960 Aykroyd reached FAO’s retiring age, and he moved to join his friend, B. S. Platt, at the London School of Hygiene. There, he organized special courses for students from English-speaking countries in Africa and visits to the Third World for Western students (1).

In 1964 he spent some months in the Caribbean for WHO, studying especially the health of young children. Death rates between the ages of 6 and 24 mo were, in some islands, 20 times the corresponding rate in the U.S. (24). The most common cause of death was a combination of malnutrition and gastroenteritis resulting from very early weaning and the purchase of proprietary infant foods, which were excellent in themselves but given to children overdiluted because of their expense. Aykroyd recommended using cheaper, skim-milk powder. Most births were illegitimate and the mothers needed to return to work to support themselves and their children. The area concentrated on export crops with a consequent heavy reliance on imported foods.

Aykroyd had earlier become interested in slavery after reading about the actress Fanny Kemble’s disillusioning experiences as the wife of a southern plantation owner in the 1830s (25). It appears from his notebooks stored at the London School of Hygiene that he even planned to write a book about her experiences. In the Caribbean, he became interested in its sugar plantations, which depended originally on slave labor, and now was able to complete a book combining his interests. Its title was originally Sweet Malefactor: Sugar, Slavery and Human Society, but that may have been considered too forthright for American tastes, and the Chicago edition appeared as The Story of Sugar (26).

Freelance Author, 1967–1979

He again reached university retirement age in 1966 and moved with his wife to the Oxford area. There he wrote a novel that is still only in typescript, but produced “The Conquest of Famine” (18). The British, Swedish, and U.S. Nutrition Foundations made it their 1974 award book, as “an authoritative and
absorbing examination of man’s historic battle against starvation.” It lists the common causes of famines as being drought, floods, locusts and fungi, the last being responsible for the terrible Irish famine of 1843–48 that resulted from successive potato crops being rotted. Chinese famines had mainly been caused by huge areas of flooding, and Indian famines by drought, though the Bengal famine, in which Aykroyd was directly concerned, and that in the Netherlands in 1944–45, had both resulted from wartime disruptions of supply. He ends his book with concerns over the ever-increasing world population and the consequent importance of providing birth control supplies and education in the Third World.

Aykroyd also served as a volunteer consultant for Oxfam, the charity organization concerned with providing aid to those in most need. He apparently was resisting calls by some activists to denounce proprietary infants foods being used as substitute for breast-feeding. In one pamphlet found among his papers, he wrote: “The remarkable transformation in infant health in the affluent countries … and a great reduction in infant mortality was achieved in spite of the virtual abandonment of breast-feeding.” And in a further piece headed “Infant feeding,” with no date but containing a 1973 reference, we see: “Another point which seems to be emerging is that the instinct to breast-feed is largely a fabrication of male obstetricians.” Obviously, he could still, in his 70s, pen a wicked phrase.

It was in 1979, a few days short of his 80th birthday, that he died from heart failure. He lived a full life and his accomplishments were recognized. In Britain he had been decorated by the Queen, and in the U.S. he was made an honorary member of both the American Institute of Nutrition and the American Public Health Association; and his books remain available in our libraries.

**Literature Cited**