

Obstacles to Government-Assisted Agricultural Development in West Africa: Cotton-Growing Experimentation in Ghana in the Early Twentieth Century¹

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IN agricultural history, as in that of science and industry, the description of spectacular achievements has always been more fashionable than the analysis of projects that ended in stagnation or failure. Whether history or development economics is invariably well served by this "progress-oriented" approach is debatable. In many of the less developed regions of the world it is probable that abortive schemes for agricultural development far outnumber those which have been successful. The record of government-assisted agricultural innovation during the colonial period in West Africa is replete with cases of unsound planning, poorly managed programmes, and projects frustrated by intractable environmental difficulties which deserve more than passing attention if general problems of African agriculture are to be understood. It is not the task here to analyse the overall determinants of agricultural change in the tropics nor to join in the often strident debate over the general effectiveness of colonial agricultural assistance programmes.² An historical analysis of the origins of British involvement in cotton-growing in Ghana, of the measures which were taken, and the reasons for their failure may help to cast light on the complex combination of human and environmental constraints which have impeded government-assisted development in West Africa during the colonial period and after.

Untutored westerners are apt to assume that tropical Africa is a homogeneous entity and that problems of agricultural progress in various parts of the continent are open to uniform analysis or easy summary. In fact, the diversities of environment, systems of production, and related social institutions, both within major regions and often within a single country, are wide enough to make any simplified classification of problems hazardous. Major constraints on agricultural development in West Africa which are commonly emphasized include: (1) poor basic resource endowments, including lack of adequate year-round water supply and soils deficient in vital mineral nutrients as a result of leaching and erosion; (2) prevalence of disease parasites and vectors destructive to domesticated animals and plant life and debilitating to human labour; (3) overreliance in many countries on

¹ The writer is grateful to Harold Woodman, Purdue University, Roger Thomas, University of Ghana, and Victor C. Uchendu, University of Illinois, for brief comments.

² For some recent harsh criticisms of general colonial agricultural policy and practice in West Africa, see Michael Crowder, *West Africa under Colonial Rule*, Evanston, Ill., 1968, pp. 282-3.

a narrow range of tropical export products which are susceptible to wide price fluctuations; (4) inadequate investment in irrigation, transportation facilities, marketing, and credit agencies, the entire network of infrastructure and services without which commercial agriculture cannot function.¹ General consequences of this situation (which persist in many countries up to the present day) were low levels of farm productivity, both of export crops and food crops, and low real incomes per head increasing at a slow rate with an inadequate proportion of rural incomes devoted to savings and investment. Most introductory surveys concerning barriers to development in West Africa are useful only as bases of departure, and general models of development are open to qualification and criticism when applied to specific areas.

Before analysing cotton-growing projects in the Gold Coast, 1902–20, it is important to recall the limited range of scientific data which was available to early twentieth-century pioneers in African agricultural research. Experience gained from British agriculture was seldom applicable to West African conditions.² During the nineteenth century, the staff of the Royal Botanical Gardens at Kew under Sir Joseph Hooker had endeavoured to collect and collate information on the classification and geographical distribution of economic plants in many parts of the tropical world; but taxonomic work on the plant life of Africa was still in the rudimentary stages.³ In the case of cotton, few of the exotic and non-plantation species had been properly classified or their genetic characteristics identified.⁴ The science of soil chemistry was in its infancy; as late as 1923 two pioneer agronomists could write that “the distribution of the great soil belts over the continent of Africa seem to have received hitherto no attention whatever.”⁵ The economics of traditional techniques on African small farms were not fully appreciated. Of course, little scientific information in such subsidiary fields as plant pathology, insect and weed control, and irrigation existed to guide extension officers in their earliest efforts. For European agricultural staff posted to British West Africa in this period, introductory instruction in horticulture was available at Kew Gardens; but systematic training of sizeable numbers of government personnel in the rudiments of tropical agriculture came only with the establishment of the Imperial College of Agriculture at Trinidad in 1922.

¹ For useful introductory studies of problems of agricultural development in Africa, see articles in the symposium ‘Agricultural Economics’, published in *The Canadian Journal of African Studies*, vol. 3, no. 1, Winter 1969, pp. 141–200; A. T. Mosher, *Getting Agriculture Moving*, N.Y., 1966; A. M. Kamarck, *The Economics of African Development*, N.Y., 1967; C. K. Eicher, *Research on Agricultural Development in Five English-Speaking Countries in West Africa*, N.Y., 1970; Guy Hunter, *Modernising Peasant Societies*, 1969.

² For example, deep ploughing, whether by animal-drawn or mechanized implements, can be harmful under West African soil conditions. It was attempted in a few cases in the colonial period but was invariably abandoned when it was demonstrated that it hastened the disintegration of humus in the extremely thin layer of fertile top soil. The most common tillage instrument in most parts of West Africa is the short hoe.

³ For a summary, see W. B. Turrill, *The Royal Botanic Gardens, Kew, Past and Present*, 1959, pp. 47–63.

⁴ As late as 1926 the world’s leading expert on cotton, Sir George Watt, noted that the genus *Gossypium* had been very largely neglected in taxonomic studies.—Sir George Watt, ‘*Gossypium*’, Kew Gardens, *Bulletin of Miscellaneous Information*, no. 5, 1926, pp. 193–207.

⁵ H. L. Shantz and C. F. Marbut, *The Vegetation and Soils of Africa*, N.Y., 1928, p. 131.

II

Cotton-growing in West Africa can be traced back many centuries, long before the advent of European explorers and traders. Medieval Arabic sources speak of cotton cultivation in the vicinity of the River Niger,¹ and it is possible that seeds were introduced into the Voltaic basin in the north of present-day Ghana prior to the first Portuguese contacts on the Gold Coast. This indigenous cotton grew mainly in interior savannah areas. On the sea coast the Dutch in Apollonia and the Danes in the Accra region experimented with small plots in the eighteenth century, but cotton did not thrive in these districts.² During the nineteenth century, British travellers to the interior found indigenous cotton in three main varieties: "Green Seed," "Kidney," and, most important, "Volta River" cotton which provided the best yields. Although it is uncertain from which original African or foreign stock this Ghanaian cotton derived, plants were subsequently classified with the American group of short-staple upland cottons (species *Gossypium punctatum* and *G. hirsutum*) rather than with long-staple Egyptian and American "sea island" (*G. barbadense*) varieties. Many nineteenth-century European observers mistakenly assumed that this was wild cotton.³ In fact, as two or three perceptive government travelling commissioners noted, cotton was generally cultivated in small quantities, usually in combination with food crops, by the Ewe people in the trans-Volta territories of the south-eastern region and by the Dagomba and other peoples in the Northern Territories.⁴ It seems unlikely that much cotton from the Northern Territories was then exported by sea, but yields were sufficient to sustain a local weaving industry. Speaking of the extreme north-west of that region, one officer wrote: "The people . . . are essentially agriculturists, cultivating extensively and intelligently. Flax and cotton are cultivated in small quantities for personal use; while tobacco surrounds each compound and is sold to Moshi and other traders."⁵

During the middle decades of the nineteenth century a number of African as well as British private groups, including the Gold Coast Agricultural Society, the Methodist Church, and the F. and A. Swanzy mercantile firm, tried to stimulate commercial cultivation by small-holders in the coastal districts through instruction at small model plantations.⁶ The earliest government-supported attempt was that initiated by Governor W. Brandford Griffith, who also established the colony's

¹ For example, al Bekri, *L'Afrique Septentrionale*, tr. de Slaney, Paris, 1859, pp. 378-9.

² John Beecham, *Ashantee and the Gold Coast*, 1841, p. 139; K. B. Dickson, *An Historical Geography of Ghana*, Cambridge, 1969, pp. 74-5, 94-5.

³ See, for example, T. E. Bowdich, *Mission from Cape Coast Castle to Ashantee*, 1819, p. 326. R. A. Freeman attempted to draw a clear distinction between cultivable varieties, such as Egyptian cotton, and "African cotton" which was by definition regarded as "wild."—*Travels and Life in Ashanti and Jaman*, N.Y., 1898, p. 543.

⁴ Rept. by G. E. Ferguson, 19 Nov. 1892, encl. 1 in Griffith (Secret) to Ripon, 26 Nov. 1892; Colonial Office 96/226. Also, Rept. by Asst. Inspector Lethbridge, 4 March 1889, encl. in Griffith to C.O., C.O. Afr. 354, No. 42, p. 75.

⁵ Rept. by Captain O'Kinealy, Northern Territories Boundary Commissioner, encl. in Rodger (conf.) to C.O., 19 Dec. 1904; C.O. 96/421.

⁶ Rept. of Methodist Industrial Garden (Gold Coast), 28 Feb. 1852, *Acts. and Papers*, 1852, (1539), xxi. Testimony of A. Swanzy, 15 May 1865, Minutes of Evidence before Parliamentary Select Committee on West Coast of Africa, *Repts. of Committees*, 1865, (412), v.

first Botanic Station at Aburi in 1888.¹ But few of these early experiments lasted more than two or three years; and contemporary reports relate that the plots had returned to bush as a result of sharp climatic variations, slipshod cultivation, and lack of financial resources. There was, in fact, little continuity between these efforts and the government cotton-growing projects of the early twentieth century.

What prompted substantial support for West African cotton experimentation by British governmental and corporate business interests were serious world shortages and sharp price rises for the raw product which afflicted the Lancashire cotton industry around the turn of the century.² The causes for this cotton price inflation, first attributed entirely to the unprecedented ravages of the boll weevil in the United States during the 1890's, were in fact more complicated, and grew in part out of the shortage of cheap black labour on southern plantations coupled with the burgeoning demands of the American cloth industry.³ Supplies of cotton from British India and Egypt were insufficient to remedy the situation; during 1901-4 the desperate straits of the British weaving industry were reflected in falling profits, work stoppages, and widespread unemployment.

It was against this background of the "second world cotton famine" that the British Cotton Growing Association was formed in June 1902 under the leadership of the Liverpool shipping magnate A. L. Jones,⁴ with the assistance of prominent Lancashire politicians and civic leaders in the Liverpool, Manchester, and Oldham chambers of commerce. Initially established as a private voluntary body with a guarantee fund of £100,000, the B.C.G.A. was subsequently strengthened by grant of a Royal Charter of incorporation in 1904, which enabled Jones to raise the nominal value of its capital stock to £500,000. The Association's call for large-scale British government support of cotton-growing programmes overseas coincided with the thrust towards expansionist-developmental imperialism led by Joseph Chamberlain, Secretary of State for the Colonies, 1895-1903. Basic to Chamberlain's economic imperialism was a reaction against previous reliance on the doctrine of colonial self-sufficiency in matters of finance and development which, he believed, had left Britain's West African possessions as economically stagnant backwaters. He resolved to inaugurate a new era of state-assisted economic development where the British Imperial government would work in partnership with private enterprise to invest capital in research and to spread knowledge of export crops among peasant cultivators in tropical colonies.

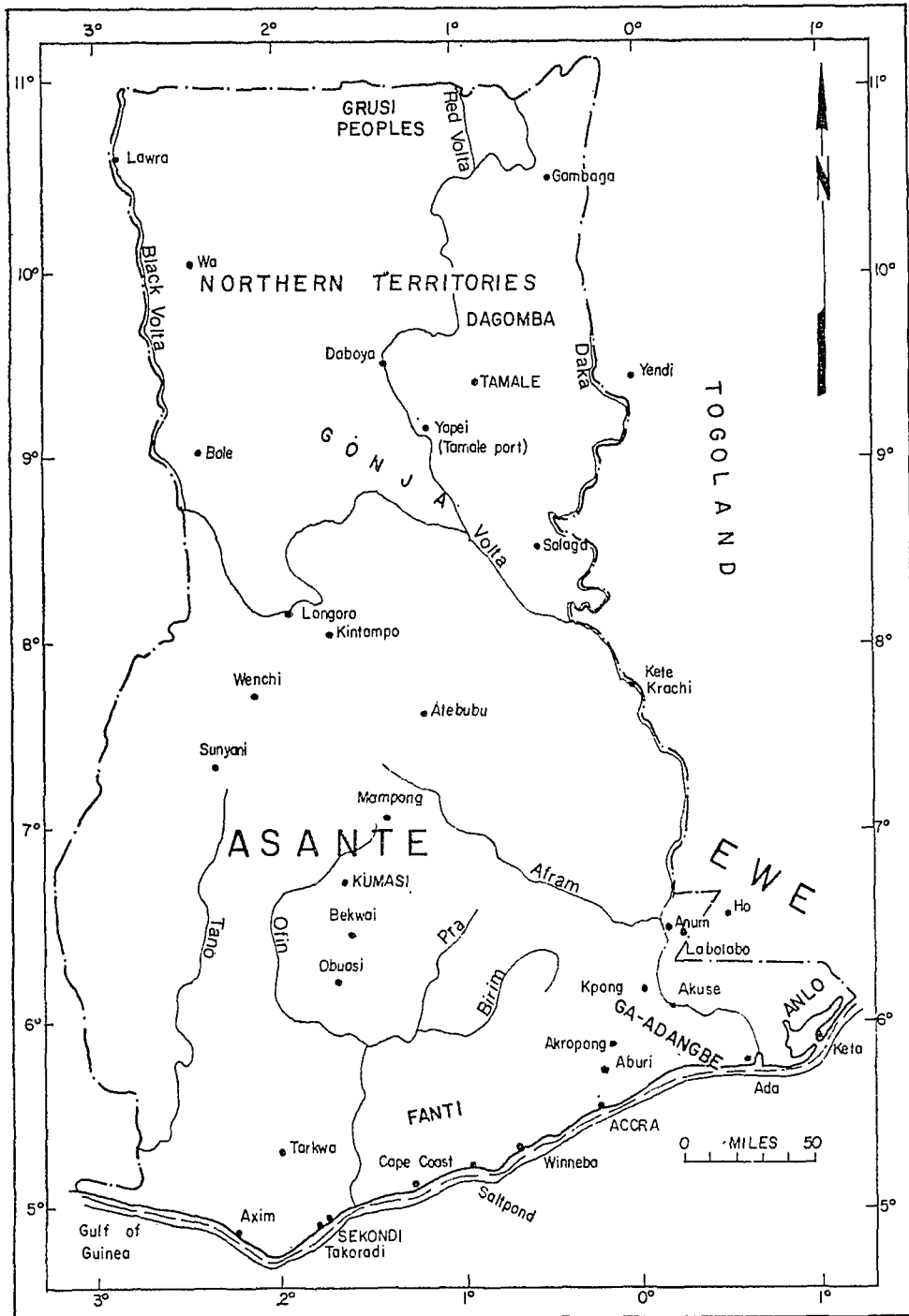
Chamberlain's communications with Jones opened the way for the negotiation of

¹ Griffith to Holland, 21 Feb. 1888, nos. 1 and 3 of 'Visit of Governor of the Gold Coast to the Eastern Districts of the Colony', *Acts. and Papers*, 1888, (c. 5249-5), pp. 3-9, 12, LXXII.

² It was reckoned that during a period of one year Lancashire manufacturers, spinners, and operatives suffered a total direct loss of £2 million.

³ Arthur Redford, *Manchester Merchants and Foreign Trade*, II, Manchester, 1956, p. 77. In 1904 the volume of American cotton production fell so far short of world requirements that American speculators were able to corner nearly the whole of the crop.

⁴ Jones was Chairman of the Elder Dempster Shipping Lines and President of the Liverpool Chamber of Commerce. The extent of his commercial interests in West Africa was vast. For biographical information, see A. H. Milne, *Sir Alfred Lewis Jones*, Liverpool, 1914.



Sketch map of the Gold Coast, Asante and Northern Territories (c. 1905).

special agreements between the Cotton Growing Association and the five dependencies of The Gambia, Gold Coast, Sierra Leone, Southern Nigeria, and Northern Nigeria for the establishment of cotton-research and demonstration stations.¹ In Colonial Office and B.C.G.A. policy discussions on cotton-growing in West Africa three basic considerations were paramount: (1) to increase the flow of tropical raw materials from Africa to the United Kingdom in order to compensate for shortages from the U.S.A.; (2) to increase the acreage under direct cultivation by clearing new tracts of virgin territory; and (3) to offset the dangers of monoculture through export-crop diversification. In contrast to policies elsewhere in colonial Africa the British Government ruled out European-owned commercial plantations; for practical rather than humanitarian reasons the Government decided that African small-holdings should be the vehicle for agricultural development. In agreements drawn up for the Gold Coast in 1902 and subsequently modified, the Association agreed to pay £1,500 per year towards the promotion of commercial cotton cultivation on condition that the colonial government contribute an equal amount. The Association's expenses included cost of seeds and distribution, agricultural implements, ginning machinery, wages of labourers, and transport of exportable cotton to the coast. In addition the B.C.G.A. agreed to purchase all cotton brought to them for ginning by African growers at guaranteed remunerative prices.²

III

For initial experiments in the Gold Coast, experts from the government and British Cotton Growing Association selected the state of Krepi in the Ewe-speaking region of the River Volta: the area had a long history of indigenous cotton-growing and its proximity to the lower reaches of the Volta provided access to the sea.³ Located on the northern margins of the Accra-Ho-Keta plain, Krepi lay in a transitional vegetational zone between the coastal savannah and forest zones best described as "tree-savannah." The structure and chemical make-up of the soils, which included a wide range of types of varying fertility—pale yellow loams, tropical blackearths, and grey hardpans—were then unclassified.⁴ Sowing commenced first at Anum, a small town in Krepi about five miles from the east bank of the Volta, where 27 acres were cleared in early 1903, and second at Labolabo, about four miles from Anum, where 105 acres were cleared and another 95 held in reserve for future planting.⁵ Despite earlier encouragement from the staff at Kew Gardens, efforts to propagate Egyptian cotton failed owing to the unsuitability of local soils and the

¹ For further analysis of the impact of pressure groups on Chamberlain's policies, see R. E. Dumett, 'British Official Attitudes in relation to Economic Development in the Gold Coast, 1874-1905,' unpublished Ph.D. thesis, University of London, 1966.

² Colonial Office Memorandum, 'Government Action in Encouragement of Cotton-Growing in Crown Colonies', *Acts. and Papers*, 1910, (Cd. 5215), pp. 4-5, LXVI.

³ Govr. Nathan (36) to C.O., 25 Jan. 1903; C.O. 96/406. Govr. Rodger (121) to Lyttelton, 14 March 1904; C.O. 96/417.

⁴ For detailed analyses of the soils of Ghana see articles by H. Brammer, and P. Nye and D. Stephens in J. B. Wills (ed.) *Agriculture and Land Use in Ghana*, London and Accra, 1962, pp. 88-106, 127-43.

⁵ *Gold Coast Annual Report for 1903*, p. 22.

lack of irrigation facilities.¹ Attention was given to the improvement of indigenous varieties of cotton, and the Agricultural Department was particularly hopeful that short staple American Upland cotton from the southern U.S.A. might prove cultivable under West African conditions.

During the first several years' work prospects for success appeared favourable. Close rapport was maintained between the staff of the Gold Coast Department of Agriculture, headed by W. H. Johnson and two assistants, and the local representatives of the Cotton Growing Association, J. W. Chandler and E. Fisher. At a meeting in Manchester with the Governor of the Gold Coast, officers of the Association made it clear that their main objective was to direct "all available funds to the development of a small but really good plantation which would serve as an object lesson to all native planters."² Towards this end the local experts reported no problem in recruiting a crew of 150 men and boys to serve as permanent cultivators for the model farms at a wage of 1s. per day. Nor did they experience much difficulty in maintaining the first stand of American Upland cotton, whose growth on the model farm was thought to be fairly good.³ As expected indigenous cotton grew more vigorously than the American cotton, but the bolls were less numerous.

It would be incorrect to assume that most British colonial projects for the improvement of West African agriculture were unscientific, as some recent critics have suggested.⁴ Considering the elementary state of existing knowledge in tropical agriculture, early government researchers deserve credit for their attempts to conduct original field experiments and to collect basic scientific data which would prove valuable in later agricultural projects. The cotton-growing team determined that there were considerable differences in the quality of soils within the same area. Their discovery that soil at Anum was far less suitable for cotton-growing than at Labolabo led to the abandonment of the first plantation. One block of tests was devoted to ascertaining optimal planting and harvesting dates. Cotton planted too early tended to mature during the second rainy season (September–October) with the result that bolls frequently turned black and rotted; seeds planted in August generally escaped the effects of rain and mildew, but were sometimes cut short of a full crop by the early advent of the dry season.⁵ Equally important were the tests on crop yields which the team conducted. Thus in 1905 W. H. Johnson recorded the following comparative yields at Labolabo:⁶

Type of Cotton:	Native	American Upland	Afifi
Yield of seed cotton (lbs. per acre):	369	450–730	215

¹ W. H. Johnson to Nathan, 28 Sept. 1903; Nathan Papers, Box 296–7.

² Summary statement in Rodger (107) to Lyttelton, 7 March 1904; C.O. 96/416.

³ Minute by Olivier, 28 Feb. on Rodger (56) to C.O., Feb. 1905; C.O. 96/427.

⁴ For a disparaging assessment of British West African agricultural policy, see R. Green and S. Hymer, 'Cocoa in the Gold Coast: A Study in the Relations between African Farmers and Agricultural Experts', *Jour. Econ. Hist.*, xxvi, no. 3, Sept. 1966. With references to the general work of the Gold Coast Agricultural Department, the authors write: "Agriculture was confused with decorative horticulture, and no studies of crops, yields, or techniques of cultivation were attempted."—*Ibid.*, p. 306.

⁵ B.C.G.A. Rept. on Cotton Growing at the Experimental Plantations at Anum and Labolabo, encl. in Rodger (56) to C.O., 6 Feb. 1905; C.O. 96/427.

⁶ These results were later printed in Johnson's book, *Cotton and its Production*, 1926, p. 307.

It was reported that these tests compared favourably with average yields per acre in the United States at this time, though this comparison means little since the model farm cotton was grown under controlled conditions.¹ Finally, through the assistance of the Imperial Institute in London, further tests evaluated the quality of cotton fibre produced at Labolabo and elsewhere in Ghana. Certain specimens received gradations comparable to those for "middling" cotton from the United States (4½d. to 6d. per pound).² But the real question was whether cotton of uniform quality could be produced by growers at a profit on a sustained basis. Unfortunately, the yield of cotton lint per pound of raw unginned cotton tended to be low for most West African varieties. Other studies on cotton produced in the Gold Coast (both American and indigenous varieties) showed considerable irregularity in length, strength, and fineness of fibre.³

In addition to planting experiments, the B.C.G.A. and the Gold Coast Department of Agriculture team launched a rudimentary programme of "agricultural extension" by distributing free cotton seeds and providing planting and tillage instructions to farmers in surrounding villages. W. H. Johnson as Director of Agriculture exhibited some of the resourcefulness characteristic of the better self-trained professionals who staffed colonial agricultural departments in this period. During the first years of the Labolabo experiment, Johnson and his staff spent many days in the field and distributed some 5,560 pounds of American Upland cotton seed directly to growers in the south-eastern states of eastern Krobo, Akwamu, and Krepi.⁴ Touring peasant farms in 1903-4 he reported that the seeds of American cotton planted on plots in and around Sra, Odumasi, Kpong, and other eastern towns had germinated and seemed to be in a healthy condition. At three of the locations he found that chiefs were trying to induce their people to plant the new seeds and to improve cultivating techniques through instruction on experimental plots. In a number of instances chiefs and village headmen requested more cotton seed after demonstrations had been carried out.⁵ Though officials reported that some 2,000 acres of small-holders' land surrounding the model farm was under cotton cultivation partly as a result of the team's instructional activities, the duration and scope of these efforts was limited.

Short-staffing was a perennial problem in the Gold Coast Agricultural Department: frequent invalidings and resignations owing to low pay meant that the full

¹ One estimate found in the Gold Coast documents indicated that typical yields on average land in the southern states of America ran about 250 pounds of clean cotton or 750 pounds of raw cotton per acre. Rodger (35) to C.O., 21 Jan. 1905; C.O. 96/427.

² *Gold Coast Annual Report for 1909*, p. 20.

³ Imperial Institute Report: Parl. Papers (1914-15), XLIII, (Cd. 7622-7), p. 20.

⁴ Johnson began his career as chief horticulturalist for the Marquis of Salisbury at Hatfield. Subsequently employed on the staff of Kew Gardens, he acquired a knowledge of tropical economic plants. He was appointed Curator of the Botanical Gardens, Aburi, Gold Coast, in 1898 and was made Director of Agriculture when that department was established in 1904. He served as Director of Agriculture for Southern Nigeria, 1910-19. Johnson received credit from the Gold Coast governor for his scientific knowledge, but his later career was chequered owing to serious personality differences with colleagues.

⁵ W. H. Johnson, 'General Remarks on Assistance Necessary to Develop the Cotton Growing Industry', encl. in Nathan (298) to Secretary to B.C.G.A., 2 Oct. 1903; C.O. Afr. Conf. Print 745.

complement of five Europeans was never on duty. In early 1907 the Governor reported that there were three unfilled vacancies in the Department, including Director of Agriculture and two curators.¹ A proposal for the training of a number of African "subordinates in agriculture" was apparently shelved in this period.² Furthermore, cotton was only one of a number of forest and agricultural crops which absorbed the attention of the research staff. It is worth noting that Johnson wrote pamphlets on the cultivation and collection of cocoa, rubber, kola nuts, as well as cotton, which were translated into the Ga and Twi languages.³

If the work of Johnson and his staff can be viewed as representative, then it may be necessary to qualify to some degree the conventional criticism that British colonial agriculturalists made no effort to improve food-crop cultivation. The Director hoped to augment the regular starchy diet of Africans through more widespread cultivation of legumes and other green vegetables.⁴ Encountering difficulty in persuading farmers to turn over separate tracts of land to intensive cotton cultivation, he advised them to interplant cotton with food crops in an improved way. In the traditional method of interplanting fairly high ridges of dirt were built up with the short hoe: cotton seeds were planted on the crest of the ridge, with food crops such as yams, cassava, and maize planted along the sides.⁵ Because African growers tended to plant their food crops too thickly (thus shielding young cotton plants from needed sunlight), Johnson and his staff directed farmers to give greater attention to wider spacing between seeds and to more regular weeding and thinning during the growing season.⁶ He also urged them to remove the stalks of old plants before reseeding at the commencement of each growing season. One of the interesting side results of the experimental programme was the increase in maize yield per acre from this improved double-cropping method.⁷ From the standpoint of labour inputs there is a good deal to be said for mixed farming. For soil rejuvenation, however, it is now recognized that use of maize as a second crop in cotton interplanting is of little value.⁸ Today agricultural extension officers specializing in expanded cotton production in Africa stress the importance of parallel improvements in food-crop yields on separate plots in order to release land for cotton cultivation.

In several areas where instruction in systematic cultivation was attempted, notably in Krobo, the apparent indifference of small-holders to cotton can be

¹ Rodger to Elgin, 7 March 1907; ADM 1/2/66; Ghana National Archives.

² Rodger (260) to Elgin, 17 June 1907; ADM 1/2/68; G.N.A.

³ W. H. Johnson, *The Cultivation and Preparation of Cocoa*, first issued Aburi, 1899; also *The Cultivation of Cotton*, 1903. The impact of these pamphlets was probably minimal.

⁴ W. H. Johnson, *The Cultivation of European Vegetables in West Africa*, Aburi, 1903.

⁵ Rept. by Johnson, encl. in Rodger (107) to Lyttelton, 7 Mar. 1904; C.O. 96/416. See also W. H. Johnson, *Hints on the Cultivation of European Vegetables in West Africa*, Accra Government pamphlet, 1902.

⁶ Rept. by Johnson, 1904; *Ibid.*

⁷ The maize yield on supervised plantations was said to be good, averaging 50 bushels to the acre.—Rept. on the Labolabo Experimental Cotton Farm, encl. in Bryan (490) to C.O., 15 Sept. 1905; C.O. 96/432.

⁸ It took another thirty-five years of research for soil scientists to discover that cowpeas could be successfully interplanted with cotton to rejuvenate soil without substantially reducing yields. For details see B. Christidis and G. Harrison, *Cotton Growing Problems*, N.Y., 1955, p. 161.

traced to the far greater profitability of cocoa per unit of labour.¹ Borne forward by steadily rising world prices, cocoa was beginning its surge to prominence as the dominant cash crop of southern Ghana;² and in areas where soil and climatic conditions were right, the incentives for concentration on cocoa were far too strong for farmers to take up simultaneous cultivation of other cash crops, especially cotton, which required heavy labour inputs and yielded meagre and uncertain returns.³ In general, however, there was never more than a slight possibility of competition between cotton and cocoa in the same districts. Cotton requires plenty of sunlight; and it did not do well under the thick shade canopy in the central parts of the semi-deciduous forest zone where cocoa flourished. It should be stressed that the Department sought to promote cotton mainly in those parts of the trans-Volta triangle (notably Krepi and Akwamu) on the periphery of the forest zone which were less well endowed for cocoa-growing, and which in some cases supported no cash crops at all.⁴

The failure to propagate American cotton in Ghana at this juncture can be traced primarily to the inroads of insect pests, particularly stainers (genus *Dysdercus*), which punctured and discoloured developing bolls early in the season, and several varieties of boll worms (genus *Oxycarenus*) which sucked juices from cotton seeds and rendered them infertile.⁵ Diseases such as cotton rust and areolate mildew also afflicted the American cotton plants. Though it was subsequently shown that planting of hybrid varieties between rows of maize might slow the spread of destructive pests, pesticides for coping with the boll worm had not been developed. It was thus extremely difficult for farmers to produce fertile new seeds from the previous year's stock. To have continued growing American Upland seed, the government or the Association would have had to distribute new seeds to growers every year, a task that neither were willing to perform.⁶ The American variety known as "Allen's Long Staple" which was extended with considerable success in Northern Nigeria after 1913 did not appear to be adaptable to conditions in the Gold Coast.⁷

Despite the failure of American Upland cotton, systematic commercial production of improved indigenous varieties might have taken hold in certain parts of

¹ See, for example, comment in Actg. Govr. Bryan (222) to C.O., 9 May 1911; ADM 1/2/76.

² Ghana's famous "cocoa-growing revolution" has been treated in a number of well-known sources: Polly Hill, *The Migrant Cocoa-farmers of Southern Ghana*, Cambridge, 1963; Margaret J. Field, 'The Agricultural System of the Manya-Krobo of the Gold Coast', *Africa*, 14, no. 2, April 1945, pp. 54-65.

³ An interesting insight into the attempts of African farmers is found in a comment by Mate Kole, Konor of Eastern Krobo, Record of Discussion with Actg. Govr. L. R. Arthur, 30 Aug. 1902; Nathan Papers, Box 317-19, Rhodes House, Oxford.

⁴ Cotton-growing Experts' Rept.: App. 3 to Botanical-Agricultural Dept. Rept. for 1903, encl. in Rodger (107) to Lyttelton, 7 Mar. 1904; C.O. 96/416. Also Rept. by Johnson on Expedition to Krepi and Togoland, encl. in Nathan (375) to C.O., 2 Oct. 1903; C.O. 96/410.

⁵ B.C.G.A. Rept. by J. W. Chandler, 4 Jan. 1905, encl. in Rodger (56) to C.O., 6 Feb. 1905; C.O. 96/427, *Gold Coast Annual Report for 1909*, p. 20.

⁶ Since 1945 DDT has been used effectively against cotton pests in some parts of Africa. In Northern Ghana, however, control of boll worm remains a barrier to the development of improved varieties of cotton up to the present day.

⁷ W. H. Johnson, *Cotton and its Production*, 1926, p. 118.

the eastern Gold Coast had it not been for inept handling of processing and buying operations in the initial stages. Of crucial importance was a mechanized ginning and buying installation that would have enabled the colony to market a sufficiently strong and clean fibre to attract buyers in Europe. Closely related to this was the need for a guaranteed stable price which would serve as a strong economic incentive to potential growers during the opening years of trial operations.¹ Notwithstanding the provisions in their original agreement with the Imperial government, the local agents of the Cotton Growing Association failed to set up any kind of ginning and buying centre during the first crucial years of the Labolabo project. As a temporary expedient the colonial government entered into an agreement with the F. and A. Swanzy mercantile firm, whereby the latter would utilize a small steam gin at their trading factory at Akuse on the western bank of the Volta and purchase all cotton brought to them from the Krepi-Akwamu-Krobo region.² The Swanzy agent agreed to stabilize the price of 1d. per pound for all indigenous cotton and 1½d. for all American or exotic varieties brought in.³ Interviews by officials with chiefs made it clear, however, that the promise of this guaranteed price offered an insufficient recompense to growers for the labour involved in harvesting and transport. In Governor Nathan's words: "The native is not keen on cultivating cotton for which he does not get more than 1d. per lb. in the unginned state and this price added to the cost of transport, ginning, pressing and baling and to freight charges leaves very little if any profit for the exporter."⁴ Furthermore, the small Swanzy ginning facility proved inadequate to the task: substantial quantities of raw cotton (150,000 pounds) were brought in by growers for ginning during the first year's operations, but because neither the government nor the Association had made provision for storage, large stocks spoiled without being exported.⁵ By the time the B.C.G.A. had installed its own larger steam-powered ginnery at Labolabo in 1907, disillusionment among growers had set in. In marked contrast to the British, the Germans in Togoland were to establish no less than nine separate interior ginneries and demonstration centres⁶ which accelerated the flow of small-holder production and reduced transit costs to the coast (since ginning removes about two-thirds of the raw cotton's surplus weight).

IV

How far increases in cotton exports from Gold Coast ports after 1903 can be attributed directly to the impetus of British promotional efforts is hard to determine. Although some contemporary official reports stressed that cotton exports from the Colony had multiplied nearly tenfold from 10,443 pounds volume in 1903

¹ Cotton Growing Expert's Rept., App. 3 to Annual Dept. Rep., encl. in Rodger (107) to Lyttelton, 7 March 1904; C.O. 96/416.

² Copy of letter from Gov. Nathan to British Growing Association, encl. in Nathan (471) to C.O., 15 Dec., 1903; C.O. 96/411.

³ Visit to Cotton Plantations at Anum and Labolabo, encl. in Rodger (35) to C.O., 21 Jan. 1905; C.O. 96/427.

⁴ Nathan (36) to C.O., 25 Jan. 1903; C.O. 96/406.

⁵ Johnson, Rept. on Expedition to Krepi, above.

⁶ Robert Cronevin, *Histoire du Togo*, Paris, 1962, p. 186.

to 92,886 pounds in 1906,¹ the attempt to identify this with the impact of the Government-B.C.G.A. project was misleading, since raw-cotton exports from Volta River ports had been nearly as high during several years of the period 1890-5. Such cotton as was sent to Akuse for ginning and export down river was either American cotton grown under controlled conditions at the Labolabo model farm or indigenous varieties cultivated in the traditional way in the heart of the bush. For a brief period there were high hopes that systematic cotton cultivation might be in the process of establishing itself as a major export industry in the British Gold Coast. In 1905 the Director of the Labolabo operation reported: "Almost all day carriers pass the farm with loads of cotton. The agent informs me that most of the cotton comes from the Krepi and Peki districts, while a part of it comes from further up country."² In fact, a detailed breakdown available for the year 1906 indicates that 47,837 pounds or about one-half of the cotton exported from the Gold Coast Colony in that year was grown in those Ewe states under German control, transported down the Volta to Swanzy's ginnery at Akuse by canoe, further down river by steam launch, and then exported to Europe from Ada or Accra. Of the remaining 45,049 pounds of cotton grown in British territory in 1906, approximately 25,000 pounds was shipped by the Labolabo station.³ The establishment of the Gold Coast model cotton-growing farm and ginnery and the offer of a guaranteed price undoubtedly had some effect on increased trade flows from the north-eastern interior in this period. An additional factor was the continued shortage of better-grade American cotton in European markets and maintenance of generally good world prices.⁴ The fall-off in Gold Coast cotton exports in 1909-10 can be traced to the completion of the Togoland railway which linked the port of Lome with the Peki cotton-growing district and enabled German merchants to absorb the cotton of British Krepi as well.⁵

V

The withdrawal of both the colonial government and the British Cotton Growing Association from the project in south-eastern Ghana by 1910 did not mark the end of cotton-growing experimentation. Rather, officials decided to shift their centre of operations to the recently annexed savannah lands of northern Ghana which had not yet been opened to any kind of economic exploitation. Unlike the

¹ Gold Coast Cotton Exports, 1899-1916 (lb.).

Year	Volume	Year	Volume	Year	Volume
1899	14,100	1905	29,100	1911	9,600
1900	20,900	1906	92,900	1912	20,400
1901	2,600	1907	56,100	1913	27,600
1902	—	1908	51,500	1914	23,600
1903	10,400	1909	31,300	1915	12,000
1904	57,700	1910	11,400	1916	18,000

Sources: *Gold Coast Blue Books*; *Gold Coast Agricultural Department Report for 1910*.

² Rept. by J. W. Chandler, 4 Jan. 1905; above.

³ Gold Coast Trade Report for 1906, encl. in Rodger (145) to Elgin, 17 Apr. 1907; ADM 1/2/67; G.N.A.

⁴ E. Goulding, *Cotton and Other Vegetable Fibres*, Imperial Inst. Handbook, 1917, p. 74.

⁵ Indeed, much of the cotton ginned by the British Swanzy firm was also shipped to Hamburg.—Rodger to C.O., 7 Nov. 1906; ADM 1/2/66; *Gold Coast Customs Dept. Rept. for 1907*, p. 10.

south, the Northern Territories were nearly devoid of valuable forest or mineral resources. Intensive cultivation of the land was, in general, limited to a relatively short rainy season of about three to five months. During the lengthy dry season much of the land lay parched and unused. There was some transit trade in kola nuts (carried mainly by Hausa dealers) and cattle through these territories; but the only significant product collected locally for export to the South was shea butter. Little was then known of the political, economic, and social systems of major ethnic groups of the Northern Territories, including the Dagomba, Gonja, Konkomba, and Tallensi people.¹ Agricultural pursuits centred on production of food crops, chiefly guinea corn and millet, together with yams and rice using the "bush fallow" method of cultivation.

For all this, the Chief Commissioner of the Northern Territories and others were hopeful about the prospects for cotton: it was a traditional crop in the North, and there seemed to be no other product of similar commercial potential.² Environmental conditions in the northern savannah, though far from ideal seemed roughly similar to those in Northern Nigeria, where a major cotton-growing project was then under way.³ There was an abundance of sunlight, perhaps the most crucial factor in cotton-growing. The land of the northern region, though generally less rich than that of the forest zone owing to the lack of organic matter, none the less contained pockets of fertility, including the reddish-brown lateritic soils which experts list as quite suitable for cotton-growing.⁴

As in the south-east earlier, the government entered into both research and demonstration as simultaneous operations. By 1909 colonial agriculturalists and agents of the Cotton Growing Association had cleared a plot of 18 acres at Tamale where cotton-growing and other forms of scientific crop cultivation could be demonstrated for the benefit of local farmers.⁵ Contributions in aid of the project totalled £2,000 per year (£1,000 each by the colonial government and the association), not an illiberal amount when it is considered that the general expenditure on agriculture in the Northern Territories (apart from cotton) was only slightly over £200 per annum. The environmental obstacles proved formidable. For example the unpredictability and intensity of rainfall during the single wet season in the north made scheduling of sowing and harvesting difficult. As a first step, therefore, detailed tables on monthly rainfalls were drawn up as an aid to planting.⁶ It was discovered, moreover, that much of the acreage in the Tamale area (which had been under virtually continuous cultivation in recent years) was impoverished and would

¹ The first major ethnographic study of the peoples of the Northern Territories was that by R. S. Rattray in 1929, *The Tribes of the Ashanti Hinterland*, 2 vols, 1932. More recent and intensive studies include M. Fortes, *The Dynamics of Clanship Among the Tallensi*, 1945; D. Tait, *The Konkomba of Northern Ghana*, Oxford, 1961.

² Rept. by Lt-Col. Morris on the Northern Territories, encl. in Rodger (160) to Lyttelton, 2 Apr. 1904; C.O. 96/417. In recent years considerable success has been achieved with rice production.

³ For a complete account of the B.C.G.A.'s work in Nigeria, see 'Development of the Cotton-Growing Industry in Nigeria', *The Empire Cotton Growing Review*, vol. XLIII, no. 3, 1966.

⁴ For a discussion of soils in the Northern Territories of Ghana, see chapter by P. N. Ahn, in *Background to Agricultural Policy in Ghana*, University of Ghana, Legon, 1969, p. 102.

⁵ *Annual Report on the Northern Territories for 1909*, p. 9.

⁶ Despatch from H. Bryan (663) to C.O., 5 Oct. 1910; ADM 1/2/75.

not support cotton without the addition of manure. In contrast to the Krepi project greater effort was made to disperse instruction and demonstration in several different districts. Within two years field workers, in co-operation with local chiefs, had set up small model cotton-growing plots in some eighteen villages which became centres for the distribution of seeds.

Profiting to some extent from previous mistakes in the southeast, extension officers at Tamale also devoted greater attention to assisting growers with ginning, pressing, and baling. Shortly after the opening of the project the Cotton Growing Association installed the first of several steam-driven gins and presses at Tamale. Public demonstrations given in the market-place before large crowds were said to have created "something of a sensation."¹ In 1912 additional buildings for housing a gin and press had been constructed at Yapei or Tamale port on the Volta. By raising the guaranteed price to 1½d. per pound for indigenous cotton and 1¼d. for American cotton, the agents hoped to stimulate small-holder planting according to fairly strict guidelines.² In 1914 the Cotton Growing Association set up other seed distribution and ginning stations at Wa, the chief town of north-western Ghana, and at Gambaga in the extreme north-east, and small quantities of raw cotton were brought by growers to each of these stations during the next two years.³ The minor upswing in Gold Coast cotton exports after 1912 can be attributed to the work of the B.C.G.A. team in drawing a limited number of peasant cultivators in the Northern Territories into commercial production.

Viewed in the light of the limited scientific data then available on the genetics of *Gossypium* much of the research carried on at Tamale and at Labolabo seems relatively sophisticated. When plots of American cotton again proved vulnerable to the attacks of cotton stainers and bollworms,⁴ government and B.C.G.A. researchers at the model farms experimented with hybridization of indigenous and American varieties. In a number of cases, specimens of native "Green Seed" and "Volta" cotton were selected as female parents and cross bred with various other types, including Peruvian and sub-types of Upland cotton, including "Black Rattler," "Culpepper," and "Richmond."⁵ Researchers were gratified when the first-generation hybrids yielded larger quantities of lint per acre than all previous types cultivated, while exhibiting much of the hardiness of their female parents. But the long-term results proved disappointing as the new plants possessed a common weakness of hybrids, progressive decline in the second and third generations. Experiments with cross-breeding and acclimatization of new exotic varieties were never totally abandoned at Tamale, but field workers gradually accepted the fact that the main hope for success rested with the improved cultivation of domestic types. Near the end of the period under review here, demonstrators reported that

¹ *Ann. Rept. on Nor. Terrs. for 1909*, p. 9.

² *Annual Report on the Northern Territories for 1911*, p. 8.

³ *Annual Report on the Northern Territories for 1916*, p. 7.

⁴ *Gold Coast Agricultural Dept. Rept. for 1909*, App. E, Tamale Station, p. 26.

⁵ A cross of "Volta" × "Black Rattler" was said to have been most promising in terms of yield.—*Gold Coast Annual Report for 1905*, p. 19; G. C. Dudgeon, *The Agricultural and Forest Products of British West Africa*, Imperial Institute Handbook, 1922, pp. 78–9.

indigenous "Dagomba" cotton seeds dressed with cow manure germinated quite rapidly and showed increased yields of over 12 per cent in comparison with those from unmanured land.¹

VI

Whereas early twentieth-century British cotton-growing teams had quite a realistic appreciation of the environmental difficulties which confronted them, it is doubtful whether they fully comprehended the economic and human resource implications of their work. There are practically no detailed references to the quantity, quality, or price responsiveness of local labour in contemporary government reports. The nearly complete lack of ethnographic surveys and the undeveloped state of anthropological science in this period meant that most officials in the Northern Territories were ill equipped to relate new cultivation techniques to traditional economic systems and socio-political structures. In contrast to the British experience in Buganda (East Africa) where the colonial government made effective use of a centralized hierarchy of chiefs in inducing African growers to take up cotton production, use of traditional rulers in some of the states of Northern Ghana (notably Dagomba) as seed distributors and buying sub-agents was ineffective and may have actually inhibited growers from taking up the new crop.²

It can be argued furthermore that cotton demonstration teams gave inadequate attention to the difficult adjustments in traditional attitudes and work routine which farmers in the Northern Territories would have to make in shifting from what was basically irregular subsistence cotton-growing to production for export. Systematic cotton-cultivation (whether by small-holders or on large plantations) is one of the most demanding forms of crop production in terms of labour inputs because it entails carefully timed planting, sowing of seeds at regular intervals, periodic thinning of cotton plants, constant weeding, and rapid and careful harvesting to avoid spoilage.³ Uniform quality is a major requirement. Whether adherence to such standards could have been rapidly instilled in occasional visits by the small number of agricultural advisers available in this period is debatable. Today, of course, extension experts are more acutely aware of the problems of transferring technical skills from one culture to another, and social scientists have worked out sophisticated criteria for predicting the rate of diffusion of specific innovations in particular societies, including (1) relative economic advantage, (2) compatibility with old ways, (3) complexity, (4) divisibility (the degree to which the innovation may be tried on a limited basis), and (5) communicability.⁴ Contemporary cotton-

¹ *Gold Coast Agricultural Dept. Rept. for 1915*, p. 12.

² Details on the optimal conditions which made for success in Buganda can be found in Cecil Erlich, 'Cotton and the Uganda Economy, 1903-19', *Uganda Journal*, Sept. 1957, pp. 162-75. For information on attempts to use chiefs as agents in Dagomba in the late 1920's see Minute by Director of Agriculture, 25 Jan. 1928 in ADM 56/1/404. I am indebted to R. G. Thomas for this reference.

³ There is substantial agreement on these essentials in both contemporary and recent handbooks. For two examples, see John Percival, *Cultivation and Harvesting of Cotton in Nigeria*, British Cotton Growing Association Pamphlet, Manchester, 1906, pp. 4-12; and *Cotton Production in Africa*, U.S. Foreign Agriculture Report, no. 117, Washington, D.C., 1960, p. 17.

⁴ E. Rogers, *The Diffusion of Innovation*, N.Y., 1962, pp. 124-39.

growing experts seem to have banked heavily on compatibility with traditional ways as the key to success. In fact the shift to systematic commercial cultivation of cotton for many small-holders in the Northern Territories entailed a more radical departure than officials imagined.

The extent to which socio-cultural values may act as a constraint on the development and expansion of commercial agriculture in peasant communities is still hotly debated by Africanists, and it is not the task here to examine this aspect of the problem in detail. It may be that in some areas such diverse socio-cultural factors as the relative importance accorded to economic activity in the society, the small size of the traditional group within which production is organized, and attitudes towards land, cattle, or the use of animal fertilizers inhibit innovation or economic change. On the other hand, many recent studies emphasize the adaptability of traditional African social institutions to changes in production. For a significant group of economists and economic anthropologists it is the economic factors which control the adoption of new technology, and in their views most African farmers are quite rational in assessing these factors.¹ That an export-oriented production system had not yet penetrated many parts of the Northern Territories by 1910 certainly did not mean that the people were non-rational about economic matters or unresponsive to price incentives.² What expatriate or government advisers consider to be a "good" price, however, may not always be a sufficient incentive to spur widespread acceptance of new production techniques or a new crop. A common but mistaken assumption of the time was that if African peasant farmers possessed land and labour in excess of subsistence needs, then such unused resources could be easily turned to export-crop cultivation. This failed to take account of the relatively weak need to earn and spend cash incomes among many peasant cultivators, and the relatively high preference for leisure once subsistence requirements had been fulfilled.³ What early twentieth-century colonial officials tended to miss was the extent to which West African farmers were generally motivated in their choice of crops not by yield per acre or total profit over an extended period but by the return per man-hour of labour. Beyond a certain level of labour output, regardless of return, cultivators in the Northern Territories preferred free time for other pursuits.⁴ Given the choice between traditional production of food and other crops for local markets plus leisure and heavy labour on an uncertain and unremunerative new export crop, peasant farmers quite naturally chose the former. Even in an efficient cotton-growing region such as Uganda, as recent

¹ See for example Victor C. Uchendu, 'Africa's Small Farms: Parameters for Policy Formation' in R. E. Dumett and L. J. Brainard (eds.) *Problems of Rural Development*, Leiden, E. J. Brill, 1975.

² That farmers in western Dagomba expanded food crop production for market upon learning that surpluses could be sold to the increasing numbers of colonial civil servants at Tamale demonstrated a sensitivity to profitable trading opportunities.—*Northern Territories Report for 1911*, p. 8. Later they took up commercial production of groundnuts without government aid.

³ One has to be wary about misinterpreting this term in the African context. Some critics assume that it is a euphemism for pursuit of pleasure, or mere idleness. This overlooks the fact that much of an adult African's leisure time was devoted to maintenance chores, rearing children, and other family duties.

⁴ Typical government reports of the colonial period explained N.T. farmer's attitudes towards commercial agriculture as one of mere "lack of interest."

experience shows, farmers will forgo cotton if some other marketable crop requiring fewer man-hours of labour per unit of return is introduced.¹

It was perhaps a testament to the patience of the cotton-growing advisers that some research in the Northern Territories was carried on spasmodically for another twenty years despite scant success. For some years optimistic reports continued to be disseminated for the benefit of Members of Parliament and the Colonial Office staff, but there was a wide gulf between the results of experimental plant-breeding at government stations and the diffusion of new growing techniques among the people. A progress report issued in 1915 noted that the maximum average amount of seed cotton grown at the Tamale station had doubled over the previous season from 72.5 to 158.3 pounds per acre.² But most of the cotton seed distributed to growers by British advisers seems to have been cultivated by traditional methods with little improvement in yields or quality. Furthermore, the price offered for local cotton at the buying stations was artificial in terms of its value on the international market. The B.C.G.A. had to absorb the prohibitive costs of transport by head portage overland from Tamale to Kintampo and thence down the Volta to the coast.³ They could scarcely be expected to subsidize local prices indefinitely when comparative advantage on the international market lay with a number of other African countries, in addition to Egypt, India, and the southern United States. New experiments to enhance soil fertility and cotton yields through use of green manure, though promising, proved far too costly for introduction on a large scale. The volume of cotton which peasants in the north brought in for ginning and export appeared significant, but was relatively small. Even the price which the B.C.G.A. offered was insufficient to attract many African growers. During the first half of 1916, for example, some 35,445 pounds of seed cotton and 6,537 pounds of cotton lint were purchased from peasants in the Northern Territories by agents at the three stations of Tamale, Gambaga, and Wa; but the size of these harvests was not commensurate with the amount of seed originally distributed and planted.⁴ The unremunerative nature of the operations, and the general economic strictures imposed by the First World War, finally forced the British Cotton Growing Association to withdraw its support from any further cotton-growing and buying experiments in the Gold Coast in 1916, although the colonial government continued to maintain a small experimental plot under cultivation at Tamale until the late 1920's. Today, the government of independent Ghana and various international agencies are still conducting intermittent research in the hope of developing a marketable strain of exotic or hybrid cotton that will survive and attract growers in the Northern Territories.

¹ There has been a shift in parts of Uganda away from cotton towards coffee-growing in recent decades, because cultivation of one acre required only about 80 man days of work per year as compared to 140 for cotton; and an acre of coffee yields returns two or three times as great.

² *Gold Coast Agricultural Department Report for 1915*, p. 12.

³ The cost of transporting a load of ginned cotton from Tamale to the Coast by headload and by canoe was greater than its value. Had cultivation of a marketable grade of cotton proved feasible in the north, transport would have loomed as a major problem. The Chief Commissioner thought that transport costs might be considerably reduced by dredging the upper reaches of the Volta.—Rept. by A. Morris, Commr., Northern Territories, 28 Feb. 1902, encl. in Nathan (162) to C.O., 12 May 1902; C.O. 96/396.

⁴ *Annual Report on the Northern Territories for 1916*, p. 7.