

THE STATE AND PRE-COLONIAL DEMOGRAPHIC HISTORY : THE CASE OF NINETEENTH-CENTURY MADAGASCAR (1)

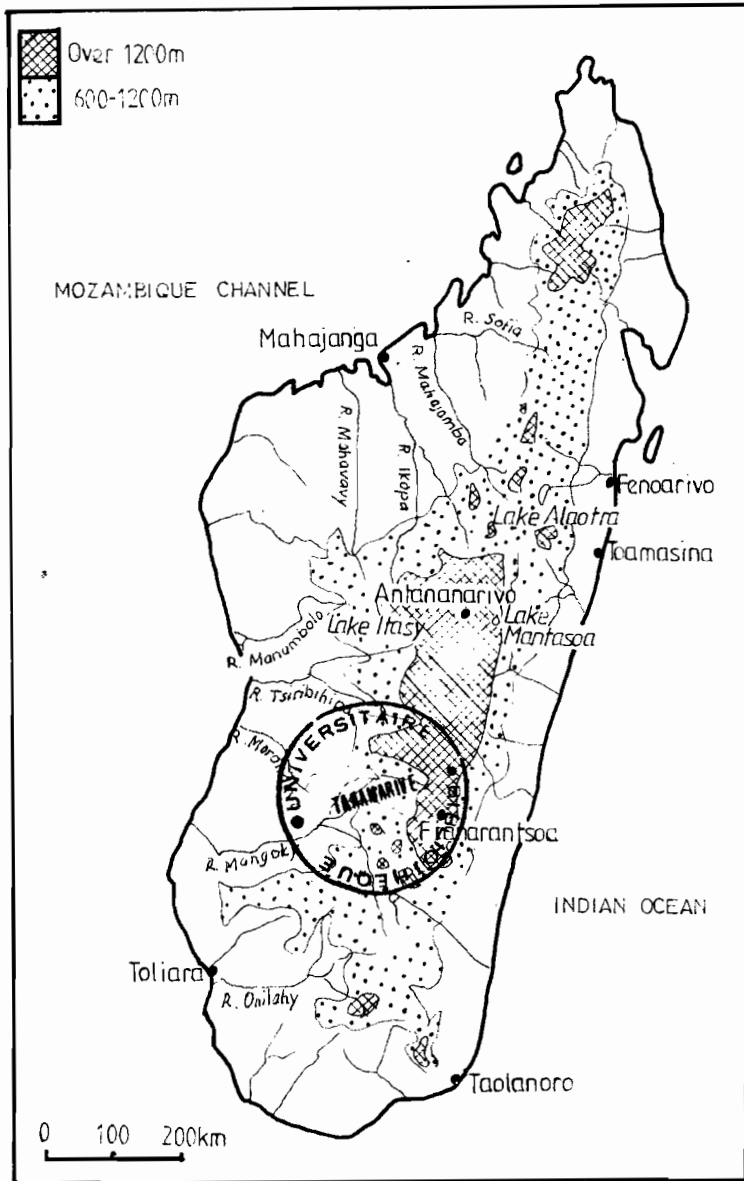
by

Gwyn CAMPBELL(2)

The historical demography of pre-colonial tropical Africa has recently generated considerable debate, notably between supporters and critics of the demographic transition theory. Both groups assume an intrinsic opposition between "natural" and human demographic forces and consider that the later predominated in the colonial era. However, they differ as to the impact of the two sets of forces. Supporters of the demographic transition theory consider that pre-colonial Africa experienced high rates both of fertility and of mortality, due primarily to internecine "tribal" warfare and disease. As a result the population remained largely stagnant until the colonial era, when security and medical services provided by the Europeans induced rapid population growth

(1). I wish to acknowledge the financial assistance of the Human Science Research Council towards research conducted for this article, and the criticism of Professor Joseph Miller of its earlier drafts. Readers wishing a complete list of references upon which population estimates and famine and diseases in nineteenth-century Madagascar are based, should consult the author. *The following abbreviations appear in notes* : AAMM Antananarivo Annual and Madagascar Magazine; AHD, African Historical Demography I and II, Centre of African Studies, University of Edinburgh, 1978 and 1981; AIHP, Archives Historiques de la Vice-Province, Société de Jésus de Madagascar, Antananarivo; ALGC, Archifdy Llyfrgell Genedlaethol Cymru/Archives of the National Library of Wales, Aberystwyth; ANM, Archives Nationales de Madagascar, Antananarivo; BAM, Bulletin de l'Académie Malgache; BL, British Library; BRA, Barlow Rand Archives, Johannesburg; CO, Colonial Office series in the Public Record Office (PRO), London; RA/RII, Raombana "Annales" and "Histoires" (1853) -in the Archives of the Académie Malgache, Antananarivo Raombana, other manuscripts by Raombana in the Archives of the Académie Malgache, Antananarivo; REC/CR MZL, Ropes, Emmerton & Co. Correspondence, Madagascar and Zanzibar Letterbook (1883-85), Essex Institute, Salem, USA; SOAS/LMS MIL, Madagascar Incoming Letters. Archives of the London Missionary Society, School of Oriental and African Studies, London.

(2) University of the Witwatersrand, Johannesburg. Cette communication fait l'objet d'un texte remanié qui a été publié dans *Journal of African History*, 32 (1991) p. 415-445. Il est reproduit avec l'aimable autorisation de l'éditeur (NDLR).



Map 1: Madagascar physical relief

by simultaneously raising birth rates and depressing mortality rates (3) Critics of the demographic transition theory consider it more applicable to pre-industrial Europe than to pre-colonial tropical Africa, where they claim that while minor climatic changes, blights, drought and epidemics formed part of a normal five to ten-year cycle that caused occasional food shortages, population increased slowly but steadily in the long-term. Thus, they argue, natural causes alone tended to leave a long-term margin of births over deaths (4). Moreover, land in pre-colonial Africa was abundant, so that conflict over living space was minimal and, in contrast to Europe, did not act as a powerful constraint on population growth (5). Only when severe social dislocation caused by human factors imposed upon this natural rhythm might famine occur and population growth be retarded. Thus, for example, the slave export trade drained many African societies of their youngest and fittest members and created such economic and social dislocation as to raise death rates and depress fertility (6). More serious was the lowering death rates (7), involved in its initial phase an unprecedented level of violence and social dislocation that so upset the ecological balance that a catastrophic series of human and animal diseases ensued. Only from the 1920s did colonial health measures and public security induce rapid population growth (8).

(3) J.C. Caldwell, "Major questions in African demographic history", in *AHD*, i, 7-8 ; see also John Hiffe, "The origins of African population growth", *J. Afr. Stud.*, xxx (1989), 165-6 ; Joseph C. Miller, "Demographic history revisited", *J. Afr. Stud.*, xxv (1984), 94.

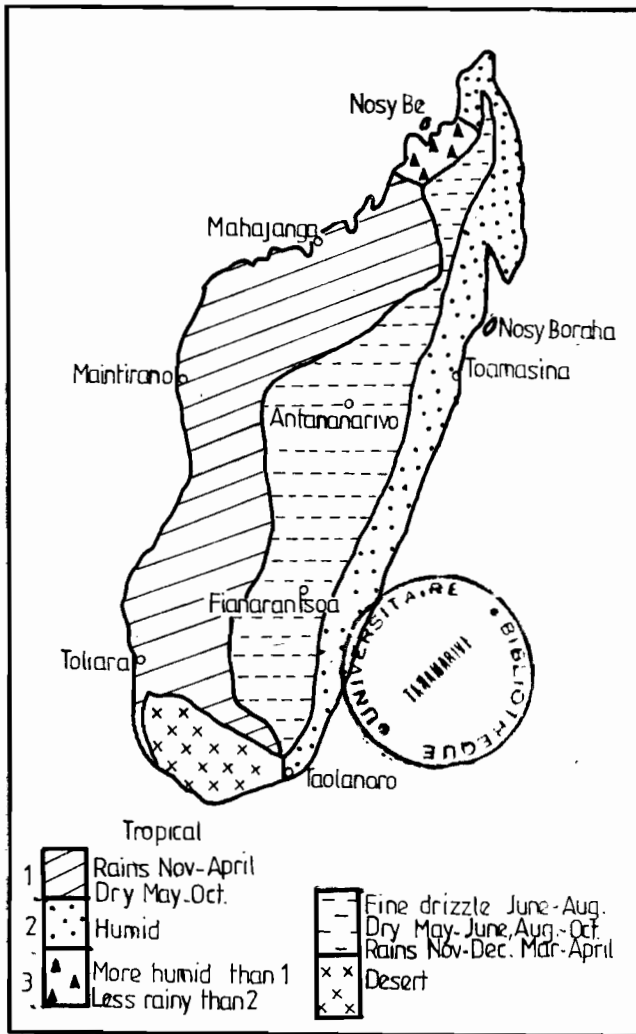
(4) See Caldwell, "Major questions", 10 ; J.E. Inikori, "Under-population in nineteenth century West Africa : the role of the export slave trade", in *AHD*, ii, 297-9.

(5) Gavin Kitching, "Proto-industrialisation and demographic change : a thesis and some possible African implications" *J. Afr. Stud.*, XXIV (1983), 230.

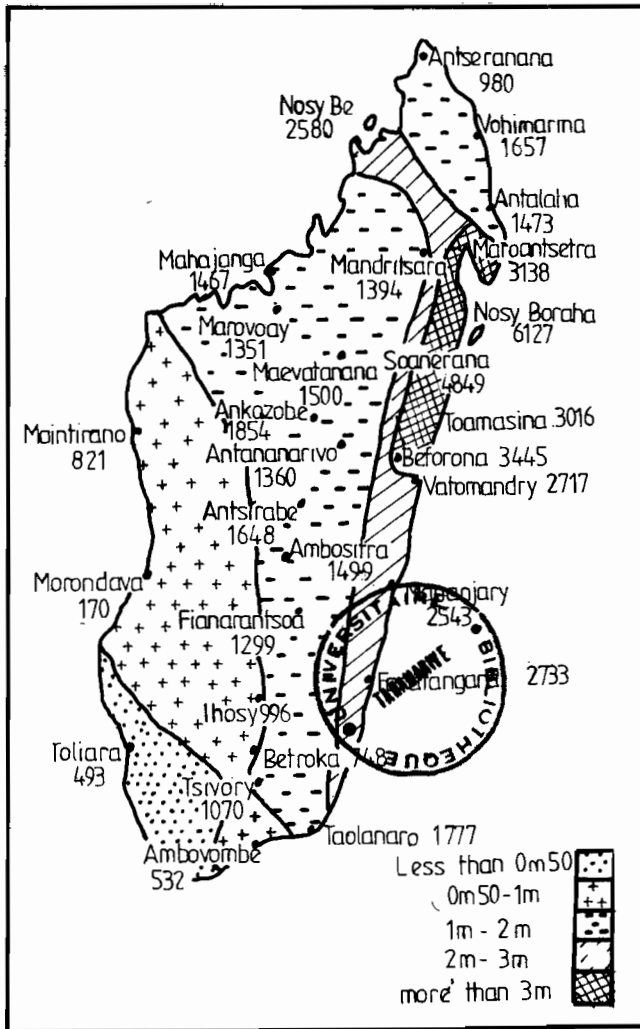
(6) J.D. Fage, "Slavery and the slave trade in the context of West African history", *J. Afr. Stud.*, X (1969), 393-404 ; see also Helge Kjekshus, "The population trends of East African History : a critical review", and R.G. Willis, "Comment on Dr Kjekshus "paper", in *AHD*, I, 358-60, 363-4 ; Patrick Manning, "Contours of slavery and social change in Africa". *Amer. Hist. Rev.*, LXXXVIII (1983), 835-857 ; Inikori, "Under-population", 283-314, and Patrick Manning, "A demographic model of African slavery", *AHD*, ii, 371-84 ; for East Africa, see J.P. Chretien, "Démographie et écologie en Afrique orientale à la fin du XIXe siècle : une crise exceptionnelle ?", *Cah. Et. Afr.*, XXVII (1987), 46-7 ; Kjekshus, "Population trends" ; and R.W. Beachey, "Some observations on the volume of the slave trade of eastern Africa in the nineteenth century", in *AHD*, i, 352-62 and 363-73.

(7) Kitching "Proto-industrialisation", 221-3 ; Caldwell, "Major questions", II, 12-16 ; Dennis D. Cordell, Joel W. Gregory and Victor Piché, "African historical demography : the search for a theoretical framework", in Dennis D. Cordell and Joel W. Gregory and Victor Piché (eds) *African Population and Capitalism* (Boulder, 1987), 14-15.

(8) Christopher Wrigley, "Population and history : some innumerate reflexions", *AHD*, ii, 17-18 ; Chretien, "Démographie et écologie", 47-50 ; Kjekshus, "Population trends", 352-62 ; Cordell *et al.*, "African historical demography", 14-32 ; Joel Gregory and Victor Piché, "Démographie, impérialisme et sous-développement : le cas africain", in D. Gauvreau *et al.* (eds). *Démographie et sous-développement dans le Tiers-Monde* (Toronto, 1986), 11-46 ; Dennis D. Cordell and Joel W. Gregory, "Historical demography and demographic history in Africa : theoretical and methodological considerations" *Cah. J. Afr. Studies*, XIV, (1980), 389-436 ; Inikori, "Under-population", 293.



Map 2: Madagascar- climatic zones



Map3 Madagascar annual rainfall.

Available evidence, based on 'guesstimates', concerning nineteenth century Madagascar, suggest overall population stability, with marked losses in certain regions - demographic characteristics usually associated with the colonial era. This pattern prompts a re-examination of the assumptions underlying the debat surrounding the demographic transition theory.

THE ROLE OF THE STATE

Central to the debate is the relative impact of natural and human factors upon the demographic regime. A case favouring "natural" factor could be made to support the argument that Madagascar was by the end of the eighteenth century suffering from overpopulation, as defined by the ability of the land to support a given number of people under the existing technology. The land-extensive fishing, swidden, and pastoral economies of the lowland peoples of the island set far stricter limits on population growth and density than did the labour-intensive riziculture of the central highlands, which like the irrigated terraces of some Lake Victoria islands and some cultivated hilltops of sub-Saharan Africa capable of sutaining very dense habitation (9). This contrast is reflected in early colonial censuses, which revel that most lowland regions of Madagascar had population densities of from one to six people per square kilometre, except for the rich cultivated valley of the south-east which boasted ten people per square kilometre, while between six and sixteen people per square kilometre inhabited the central provinces of Imerina and Betsileo on the high plateau (10).

An indication that densities were reaching their natural limits in both lowland and upland regions of Madagascar at the start of the nineteenth century was the island-wide practice of infanticide, a ritual elsewhere associated with perennial overpopulation. In the lowland regions it was common for three days of the week to be taboo for births, babies born on those days being left to die, while in some societies, such as the Tanala entire months were taboo. The taboo against twins was also widespread on the plateau, which in addition had suffered two major famines in the early and mid-eighteenth century (11)

(9) Caldwell, "Major questions", 12-13.

(10) However, by the close of the nineteenth-century, at least, there existed sharp regional variations within Imerina, with 2 people per square kilometre in the extreme north, 11 in Vakinankaratra, 18 in west, 20 in east, and 90 in and around the capital city of Antananarivo : Alfred and Guillaume Grandidier, *Histoire physique, naturelle et politique de Madagascar* (Paris, 1908), vol. 4, t. 1, 322 ; see also J. Vansina, "Long-term population history in the African rain forest", in *AHD*, ii, 757.

(11) Louis Molet, "Le bocuf dans l'Ankaizinana : son importance sociale et économique", *Mémoire de l'Institut scientifique de Madagascar*, série C, t. ii (1953), 61-2 ; J. Richardson, "Tanala customs, superstitions and beliefs", *AAMM*, II (1876), 99-100 ; Grandidier, *Histoire*, vol. 4, t. I, 97 ; Gregoire Avine, "Notes de voyage à Fort-Dauphin" (1804), in Raymond Decary, "Le voyage d'un chirurgien philosphe à Madagascar"., *BAM*, XXXVI, (1958), 324.

Historians of Madagascar have usually argued that significant natural impediments to population expansion were overcome by the emergence in the nineteenth century of a strong indigenous Merina state, which provided internal security and progressive health and education facilities (12). Thus they would accept the McEvedy and Jones estimate of a Malagasy population steadily rising from 1,5 million in 1800 to two million in 1850 and 2,75 million in 1900 (13). Indeed, Paillard and Robequain hold that by the last of these dates the real population of the island was, for a number of reasons considerably higher : the French colonial officials who obtained the figure were untrained in census techniques ; the unsettled political state of the country and evasion of colonial tax officials by the Malagasy made the gathering of statistics extremely difficult ; and French officials had a vested interest in underestimating the population in order to excuse the low returns of taxes they were able to bring in and, above all, to disguise the negative demographic impact of the colonial regime (14). Despite Madagascar's relative isolation, the island shared with mainland Africa a heightened mortality after colonisation due to the 1895 French conquest, the 1895-1897 suppression of the *Menalamba* revolt, and the socio-economic disturbances that followed the 1896 abolition of slavery (15) Thus the Malagasy population on the eve of colonisation might well have been closer to the 3.292.527 recorded in 1921. when the first comprehensive census was completed. Moreover, whereas mos of sub-Saharan Africa experienced significant population growth from he 1920s, numbers increased in Madagascar only from the late 1940s". (16). The consensus to date is therefore that the state in Madagascar played crucial but contrasting demographic roles, the indigenous pre-colonial Merina state removing natural obstacles to population expansion and the succeeding French colonial state imposing drastic artificial constraints that largely curtailed such expansion.

Estimates assembled from a large number of pre-colonial sources, both speculative and informed, suggest a nineteenth-century demographic trend

(12) See Hubert Deschamps, *Histoire de Madagascar* (Paris, 1972), 213-15

(13). Colin McEvedy and Richard Jones, *Atlas of World population history* (London, 1978), 265.

(14) Rebellions continued until 1913 ; see Charles Robequain, *Madagascar et les bases dispersées de l'union française* (Paris, 1958), 110 ; Yvan-Georges Paillard, "Les recherches démographiques sur Madagascar au début de l'époque coloniale et les documents de l'AMI", *Cah. Et. Afr.*, XXVII (1987), 20-1.

(15) Paillard, "Recherches démographiques", 19-20.

(16) Wrigley, "Population and history", 17-18 ; for Madagascar, see, e.g., Ralinoro, "Le problème démographique dans la circonscription médicale de Fianarantsoa", *Bulletin de Madagascar*, 99 (1954), 732-40.

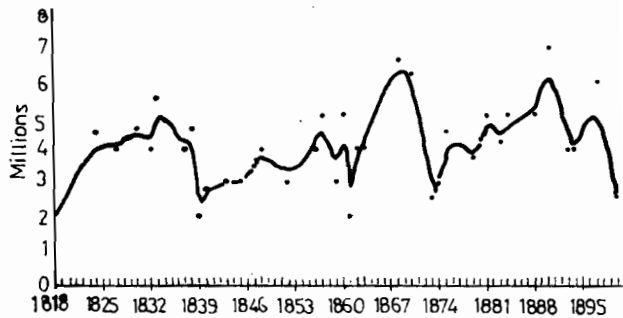


Fig. 1. Population estimates, Madagascar, 1818-1900

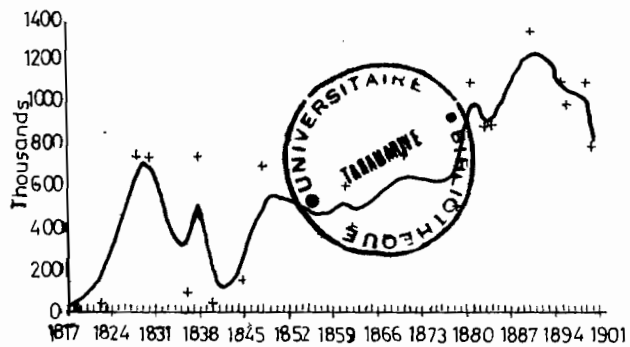


Fig. 2. Population estimates, Imerina 1817-1900

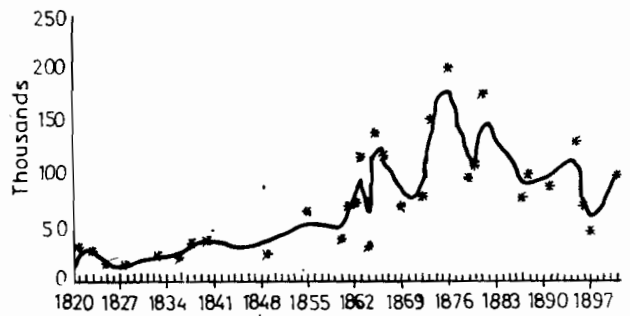


Fig. 3. Population estimates, Antananarivo 1820-1901

more in line with the flat to negative growth rates of the colonial era (17) They indicate the possibility that the total Malagasy population remained stagnant during the nineteenth century at between two and three million, whilst that of the central province of Imerina, and the Merina capital city of Antananarivo, grew. The population of Imerina increased from approximately 100000 to 500000 in the 1820s, at which level it remained albeit with sharp fluctuations during the 1830s, until the late 1870s, when it increased further to about 800000. The population of Antananarivo rose between 1820 and 1860 from about 17.000 to 50.000 and grew again in the 1860s to 100000 near which level it tended to remain, though with sharp fluctuations in both directions. The first French censuses suggest that these figures are more unreliable for Madagascar and Imerina than for Antananarivo, since the numbers for the city alone appear to reflect the impact of major killer diseases, such as the smallpox epidemics of 1875-81 and 1884-89 (18). As these population estimates have no solid statistical basis, they must be treated warily, but in the absence of more concrete evidence they nonetheless warrant serious consideration as the best data available (19). As such, they raise doubts as to the traditional assumption of steady nineteenth-century demographic expansion and suggest the existence of serious obstacles to population growth in Madagascar already at that time. The search for these obstacles naturally turns to the role of the Merina state, which, it is here argued, had a primary but negative, rather than positive, demographic impact in imperial Madagascar;

(17) See note 1 concerning sources ; see also D. Ian Pool, "A framework for the analysis of West African historical demography", in *AHD*, 1, 50-1 ; Miller, "Demographic history revisited", 93-6 ; Cordell and Gregory, "Historical demography", 396-404.

(18) See Figures 4 and 5 on disease and famine.

(19) The estimates comprise both speculations by outsiders and informed sources such as Merina court officials. The estimates with the soundest statistical basis are those which arise from attempts to calculate the number of inhabitants per house. These generally fall within the range of 3,5-5,2 people per African rural household, revealed by a 1967 UN survey (quoted in Jack Goody, "The evolution of the family", in Peter Laslett and Richard Wall (eds.), *Household and Family in Past Time* [Cambridge, 1974], 115). In 1816, Le Sage estimated households on the north-east coast of Madagascar, to average ten members, although in the 1820s, it was claimed that Andevorantso had only 4,8 inhabitants per house, close to the 1838 estimate of 4,5 for Toamasina. Estimates for Antananarivo also varied considerably : Duhaut-Cilly in 1825 and LMS missionaries in the early 1830s assumed three inhabitants per house, in comparison to Davidson's 1860s estimate of four per house, Richardson's of 8,25 in the 1870s, and the Merina government's estimate of seven. It is possible that the variations reflected whether the nuclear family alone or all residents in the household were counted, as most houses in Antananarivo possessed at least one slave and frequently accommodated non-nuclear relatives as well : Le Sage, "Mission to Madagascar" (1816), 60, CO 167/34 ; William Ellis, *History of Madagascar*, 2 vol., (London, 1838), 1, 18, 67, 96-7 ; Duhaut-Cilly, "Notice sur le royaume d'Emirne, sur la capitale Tananarivou et sur le gouvernement de Rhadama", (1825), in Jean Valette (ed.), "Deux documents français sur Madagascar en 1825 ; les rapports Duhaut-Cilly et Frère", *BAM*, XLVI (1968), 237 ; J. Richardson, "Dr Mullens and the population of Antananarivo", *AAMM*, II (1876), 72-4.

Cordell *et al.* contend that the colonial state had a paramount influence on the demographic regime of modern African societies because it shaped the mechanisms for the production and reproduction of labour through two broad labour strategies. The first involved forced labour, characterized by the use of a per-capita head tax, military conscription and direct forced labour, and the second centred on the formation of a reserve army of "voluntary" workers (20). Such state policies had vital demographic consequences, but neither was unique to the colonial era. As in most other African societies, production in nineteenth-century Madagascar was critically dependent upon the control of labour, so the size, growth and density of the population were as important to the pre-colonial African state as they were to most later European colonial regimes. Initially the Merina state played a positive role in the way traditionally suggested, for, following the major drought-induced famines in Imerina in the early and mid-eighteenth century, strong government eliminated food scarcity by organising the draining and cultivation of the vast Betsimitatatra marshland of central Imerina (21). However, with the implementation of autarkic state policies from the 1820s, the imperial Merina regime adopted oppressive labour policies that had a strongly negative demographic impact. It geographically restricted both "free" and slave labour and manipulated the labour force in other ways to serve state ends, finally creating a huge reserve state army of nominally free and voluntary workers through the 1877 emancipation decree (22). Merina imperial expansion under autarky was primarily at the demographic expense of subjected provinces, notably those of the east coast, until the mid-nineteenth century, from which time the steady collapse of the autarkic economy intensified state pressure on the labour resources of the imperial heartland (23).

FERTILITY AND THE BIRTH RATE.

Both Wrigley and Kitching highlight fertility and the birth rate as the primary demographic influences in pre-colonial Africa. However, whereas Wrigley argues that, besides natural disasters "subtle and largely unconscious social forces" operated on the birth rate and the rate of infant and child survival. Kitching posits political power holders as shaping factors bearing directly upon

(20) Cordell *et al.*, "African historical demography", 27-8.

(21) Gwyn Campbell, "Slavery and fanompoana : the structure of forced labour in Imerina (Madagascar), 1790-1861", *J. Afr. Hist.*, XXIX (1988), 465-7

(22) Gwyn Campbell, "Madagascar and the slave trade, 1810-1895, *J. Afr. Hist.*, XXII (1981), 203-27 ; Campbell, "The adoption of autarky in imperial Madagascar, 1820-1835", *J. Afr. Hist.*, XXVIII (1987), 395-409 ; Campbell, "Slavery and fanompoana", 463-86.

(23) Campbell, "Slavery and fanompoana", 478-85 ; Campbell, "Missionaries, fanompoana and the Menalamba revolt in late nineteenth century Madagascar", *J. Southern Afr. Studies*, XV (1988), 54-73 ; Campbell, "Gold mining and the French takeover of Madagascar, 1883-1914", *African Economic History*, XVII (1988), 113-16.

fertility as the most critical influence (24). Certainly in nineteenth-century Madagascar the policies of the Merina state had a major depressive impact upon such rates.

Like most mainland African communities (25) the Malagasy placed a premium on bearing children. Social mores encouraged early sexual experience and they placed few obstacles to divorce and remarriage or to extramarital sexual relations, except between lower-caste men and higher-caste females (26). Caste proscriptions did not generally include male foreigners, most of whom formed sexual liaisons with Malagasy women (27). Initially these unions tended to be short-lived, as Europeans were generally absent from Madagascar during the malarial, hurricane months from December to March (28). However, some endured, especially after the widespread adoption of quinine in the late nineteenth century permitted Europeans to reside permanently in malarial regions of Madagascar. Toamasina, for example, boasted 2 000 foreign residents by 1895 (29). A sizeable créole community arose, it being noted in 1902 for example that Bullen, a resident of Toliara since the early 1880s, had "married the usual Malagash princess, and has a numerous family" (30). This last reference, appearing to indicate a high fertility rate in Madagascar is given further backing by London Missionary Society (LMS) statistics which revealed that in 1825, 14 per cent of girl pupils in Antananarivo were obliged to leave school because they fell pregnant (31). It is

(24) Wrigley, "Population and history", 23-4 ; Kitching, "Proto-industrialisation", 230-1 ; see also Cordell et al., "African historical demography", 22-4.

(25) David Voas, "Subfertility and disruption in the Congo Basin", in *AIID*, II, 785-6, Pool, "A framework", 49.

(26) Wolf, "Analysis of 'Narrative of Voyages to explore the shores of Africa, Arabia, and Madagascar'", *Journal of the Royal Geographical Society*, III (1833), 203 ; R.P. François Callet, *Histoire des rois* (5 vol.) (Tananarive, 1974), I, 833 ; G. Mondain, "Notes sur la condition sociale de la femme hova", *BAM* (1972), 85-91. It is uncertain what effect polygamy, which was practised in Imerina during the first half of the nineteenth century had upon the birth rate. British missionaries to Imerina commented in 1833 : "Polygamy is common in this part of Madagascar, if not indeed throughout the island, to all who can afford the expense... To be able to maintain several wives, to have a numerous offspring, - to hoard wealth, - and to build a commodious and handsome tomb, these are the objects of desire and ambition in the breast of a Malagasy" ; Johns and Freeman to Ellis, Antananarivo, 29 May 1833, SOAS/LMS MIL B4 F4 JB.

(27) See, eg. James Hastie, "Diary" (1820), 482, CO 167/50.

(28) Grégoire Avine, "Voyages aux îles de France, d'Anjouan, de Madagascar, de Mosambique, de Zanzibar et à la côte Coromandel" (1802). *Mauritius Archives Publications* (Paris, 1951), V, 55 ; Capmartin, "Notes sur la Baye St. Augustin (côte occidentale de Madagascar)" (1815), 13-BL., Add. 18135 ; S.P. Oliver, *Madagascar : An Historical and Descriptive Account of the Island and its Former Dependencies* 2 vols, (London, 1886), I, 454.

(29) Grandidier, *Histoire*, vol. 4, t. I, 320-1.

(30) C.G. Smith, "Journal", Tuléar, "Madagascar, 5 sept. 1902, in : Notes taken by CGS on trip to Madagascar in 1902, MS BRA. For white-Malagasy social relations in Toamasina, see Manassé Esoavelomandroso, *La province maritime orientale du Royaume de Madagascar, à la fin du XIXe siècle (1882-1895)*, (Antananarivo, 1979), 145.

(31) Jones and Griffiths to Burder, Antananarivo, 4 Aug. 1825, SOAS/LMS MIL B2 F2 JB ; "School report" (1825) SOAS/LMS MIL, B2 F3 JG.

therefore quite possible that the birth rate in Madagascar at the start of the nineteenth century equalled if not surpassed the 48 per thousand average postulated for pre-colonial sub-Saharan Africa (32).

This presumed high natural birth rate could have been a reason for the widespread practice of infanticide which the Merina crown banned in 1823 in all Merina provinces save Imamo, from where expectant mothers were encouraged to cross into central Imerina to give birth. The ban, usually considered the result of humanitarian pleading by Hastie, the British agent resident at the Merina court (33), was probably a response to the intensified labour requirements of the imperial Merina economy under autarky (34).

Indeed, any natural tendency toward high fertility rates was profoundly disturbed from the mid 1820s by the adoption of autarkic policies, especially *fanompoana*, or forced labour for industrial and military state projects. Firstly *fanompoana* was unremunerated, and so, in contrast to the era of proto-industrialisation in Europe where the advent of wage labour might have lowered the average age of marriage and thus enhanced fertility, state conscription decreased income opportunities for young adults. State policy thus probably delayed the average age of marriage and depressed fertility. The only significant body of wage-earners were the slave porters, who were predominantly young and unattached and therefore probably contributed little to reproduction (35). Kitching argues that in Africa, in contrast to Europe responsibility for child rearing rested with the extended rather than with the nuclear family, so that parental income may not have influenced family size in Africa to such a degree (36). but such was the drain of *fanompoana* in imperial Madagascar that the ability of the extended family to sustain its own members, notably the very young and old, was steadily undermined (37).

Secondly, *fanompoana* involved harsh physical labour, with inadequate rations, over long periods of time. For women these deprivations had the effect of delaying puberty and altering ovulatory cycles, thus depressing fertility as well as increasing the incidence of miscarriages (38). Traditionally, women worked harder than men, who in Imerina from the late eighteenth century until 1820 were relieved of much of their labour due to a massive influx of slaves. Thus in 1817

(32) Hiffe, "Origins", 168.

(33) Hastie, "Diary", 6 March 1823, CO 167/66.

(34) Campbell, "Adoption of autarky", "Slavery and fanompoana".

(35) Gwyn Campbell, "Labour and the transport problem in imperial Madagascar, 1810-1895, *J. Afr. Hist.*, XXI (1980) 341-56; Campbell "Slavery and fanompoana, 463-86; Kitching, "Proto-industrialisation", 221-40.

(36) Kitching, "Proto-industrialisation", 234.

(37) Campbell, "Slavery and fanompoana".

(38) G.T. Nurse, J.S. Weiner and T. Jenkins, *The Peoples of southern Africa and the affinities* (Oxford, 1985), 253-4.

Hastie commented that "Many of the women are much stouter in person than the men... When the males arrive to manhood the greater part of their labour ceases. The women work till age overcomes them" (39). The adoption of autarky in Imerina in the 1820s and the subsequent intensification of *fanompoana* increased rather than diminished the burden of labour for females, as slave ownership narrowed to élite circles and ordinary Merina farmers were conscripted for military and other *fanompoana*, obliging plateau women to perform agricultural tasks normally executed by males. In addition, the exploitation of female labour for *fanompoana* steadily increased throughout the century, peaking after the 1883-5 Franco-Merina War, notably in the gold fields (40).

Thirdly, the frequency of conception was reduced as *fanompoana* often separated husband and wife for long periods of time. Additionally, draconian punishments effectively restricted adultery for wives of absent soldiers. Fourthly, *fanompoana* inspired such fear that some people mutilated themselves and parents commonly hid their children in order to avoid it. To spare the future generation from *fanompoana* some couples probably limited their family size through practising abortion and, despite the royal ban, infanticide (41). Decary and Sibree estimate, respectively, that infanticide was responsible for the deaths of 14.29 and 25 per cent of Malagasy babies (42). These figures fall within the 15-50 per cent infanticide rate calculated by Birdsell for aborigines in Pleistocene Australia, although there is no indication in Madagascar that, as in the latter case, more female than male babies were killed (43).

State labour policies also assisted the spread of venereal diseases by breaking up families and thus contributed to an initial lowering of fertility and to miscarriages. Voas and Brothwell date the arrival of venereal syphilis in sub-Saharan Africa to the start of the colonial era (44), but it is probable that the disease reached the Malagasy coast by the late eighteenth century through commercial contact with Europeans and the *Antalaotra* (a generic term for people

(39) Hastie, "Diary" (1817), CO 167/34.

(40) Campbell, "Slavery and *fanompoana*", 463-486 ; Campbell, "Gold mining", 99-126 ; Campbell, "Missionaries, *fanompoana* and the Menalamba Revolt", 54-73.

(41) Gwyn Campbell, "The role of the London Missionary Society in the rise of the Merina empire, 1810-1861" (Ph. D. thesis, University of Wales, 1985), 225-6, 337 ; Campbell, "Missionaries, *fanompoana* and the Menalamba Revolt", 54-73.

(42) James Sibree, *Fifty years in Madagascar* (London, 1924), 253 ; Raymond Decary, "La population de Madagascar", *BAM* (1947-8), 30 ; Decary, "Le voyage d'un chirurgien", 326.

(43) See Thurstan Shaw, "Towards a prehistoric demography of Africa", in *AHD*, II, 586.

(44) See Miller, "Demographic history revisited", 96. A non-venereal disease of the treponemal group appears to have been widespread in pre-nineteenth-century Africa, including Madagascar. Syphilis in mainland Africa was often confused with yaws ; other treponematoses include pinta, bejel and irkinga —see Huhani Koponen, "War, famine and pestilence in late precolonial Tanzania : a case for heightened mortality", *Int. J. Afr. Hist. Studies*, XXI (1988), 656 ; T. Aidan Cockburn, "Infectious diseases in ancient populations", in David Landy (ed.) *Culture, Diseases and Healing* (New York, 1977), 84-5.

of Arabic origin) of the north-west coast. The *Antalaotra*, like the "Arabic" groups in the Comoros and on the Swahili coast, experienced lower birth rates than the surrounding "indigenous" population, probably due to syphilis (45). The plateau interior was largely protected until the influx of foreigners in central Imerina from about 1817 (although Raombana blames the appearance of syphilis there on the European slave traders in the late eighteenth century (46) and in other regions from 1802, when foreigners were for the first time permitted virtually unrestricted entry into the Merina empire.

An estimated 10 per cent of clinic patients in Antananarivo in 1865 had syphilis, and a decade later 70 per cent of LMS dispensary patients in Imerina. 20 per cent in Betsileo and most in Menabe were reported to be suffering from syphilis-related complaints (47). Again the early French colonial administration considered venereal diseases to be responsible for the large number of stillbirths they recorded in Madagascar (48). However, it is likely that the "increase" in venereal disease from 1861 reflected the growth in the number of foreign medical staff and therefore a greater proportion of case reported. Moreover, it is impossible in early medical reports to distinguish between cases of venereal diseases and what the Malagasy termed *farasisa*, which included all chronic diseases with cutaneous symptoms (49). Nevertheless the venereal variety probably spread rapidly in the latter part of the nineteenth century, due partly to the increase in the influx of foreigners into Madagascar and to the permissive sexual mores of the Malagasy (50) but mostly to the increased tempo of *fanompoana* from the late 1870s. As in the Congo Basin under the exploitative "Arab" slave raiding and colonial "rubber system" of the late nineteenth and early twentieth centuries *fanompoana* in Madagascar seriously disrupted social life, causing the disintegration of families, the undermining of monogamy, and the growth of promiscuity and prostitution, notably in towns and large labour or military camps (51). Such was the barrenness of plateau women by the late nineteenth century that many made votive offerings to phallic shaped standing stones in an attempt to

(45) See Carol M. Eastman, "Women, slaves and foreigners: African cultural influences and group processes in the formation of northern Swahili coastal society". *Int. J. Afr. Hist. Studies*, XXII (1988), 13.

(46) RH, 74; Hastie, "Diary" (1817)

(47) G.A. Shaw. "The Betsileo: country and people", *AAMM*, III, (1877), 79; Grandidier, *Histoire*, vol. 4, t. I, 330; Joseph Sewell, *The Sakalava: Being Notes of a Journey made from Antananarivo to Some Towns on the Border of the Sakalava Territory in June and July 1875*, Antananarivo, 1875), 12, 17

(48) Paillard. "Recherches démographiques", 23.

(49) Paillard. "Recherches démographiques", 37.

(50) Pool, "A framework", 53; H.M. Dubois, *Monographie des Betsileo*, (Paris, 1938), 665-6

(51) Voas, "Subfertility and disruption", 786-96; see also Nancy Rose Hunt. "Le bébé en brousse"; European women, African birth spacing and colonial intervention in breast feeding in the Belgian Congo", *Int. J. Afr. Hist. Studies*, XXI (1988), 403-4; see also Phyllis M. Martin (eds.), *History of central Africa* (2 vol.) (London, 1986), II, 20.

regain fertility (52). Many taboos to assist fertility and to enhance the chances of a successful birth existed also in non-plateau regions (53).

Despite having long enjoyed the best medical and administrative services in Madagascar, Imerina had the island's lowest fertility and highest infant mortality rates by the end of the nineteenth century (54). French surveys between 1899 and 1905 indicated that an estimated 40 per cent of all deaths in Imerina occurred within the 0-5 year age range, one-third of all children born alive dying before the age of three. This figure was close to the upper range of infant mortality estimates (25-30 per cent) in modern times for the parts of tropical Africa least affected by medical and administrative service (55). Such elevated infant mortality considerably reduced the nuclear family size in some parts of Madagascar. In 1853 for example, Ellis estimated the average number of children per household at only 3,5 on the east coast and 2,5 in Imerina (56), lower than the average of between 4,9 and 5,25 children per household estimated for sub-Saharan Africa in general during pre-colonial and recent times. In early colonial Madagascar 23,99 per cent of the coastal population and 37,1 per cent of the plateau population were aged under 16 years of age, compared to an African average that would be closer to 55 per cent (57). In overall terms, low rates of fertility, birth and infant survival meant that the reproduction rate on the plateau was just sufficient to enable the region to maintain or possibly permit a slight natural increase in population (58).

MORTALITY AND THE DEATH RATE

In 1826, when autarkic policies were being adopted by the Merina crown, a British visitor to Madagascar claimed that most Merina survived past their eighteenth year (59), whilst almost a hundred years later a Frenchman wrote of :

(52) Shaw, "The Betsileo", 4 ; Sibree, *Fifty years*, 41.

(53) For instance, pregnant Antanosy women and their husbands were forbidden extramarital sexual intercourse until the birth of the child ; see Jorgen Ruud, *Taboo : a Study of Malagasy Customs and Beliefs* (Oslo, 1960), 244-4.

(54) Jean Valette, "Notes sur la géographie médicale de l'Imerina à la fin de la monarchie (1889-1893)" ; *Bulletin de Madagascar*, 246 (1966), 1143-5 ; Paillard, "Recherches démographiques", 25

(55) Grandidier, *Histoire*, vol. 4, t. I, 343 ; Paillard, "Recherches démographiques", 34 ; Caldwell, "Major questions", 10.

(56) Grandidier, *Histoire*, vol. 4, t. I, 337.

(57) Paillard, "Recherches démographiques", 33 ; for estimates of African averages, see Manning, "Demographic model", 374, and for a mainland African example of a skewed age structure see John Thornton, "The slave trade in eighteenth century Angola ; effects on demographic structure", *Can. J. Afr. Studies*, XIV (1980), 421-2.

(58) Caldwell, "Major questions", 9 ; Pool, "A framework", 52.

(59) Locke Lewis, "An account of the Ovahs, a race of people residing in the interior of Madagascar : with a sketch of their country, appearance, dress, language, &c", *Journal of the royal geographical society*, V (1835), 236.

"Un vieux centenaire d'Isotry, mort dernièrement, né de deux ans avant la mort d'Andrianampoinimerina, réunissant devant moi ses enfants, petits-enfants, gendres et belles-filles, en comptait 154. Dans la branche de Ramba, soeur de Rainilaiarivony, on comptait il y a deux ans 84 femmes. De plus les Hova [i.e. Merina] étaient polygames (60).

However, the overwhelming bulk of evidence points to a low life expectancy from birth in nineteenth-century Madagascar and to a major and direct state impact raising the death rate, which Caldwell, in contrast to Wrigley, who favours fertility, posits as an independent variable in determining population change (61).

DISEASE

Because of Madagascar's geographical isolation, the island was spared some of the more serious diseases, like trypanosomiasis and rinderpest, that periodically helped to reduce populations on mainland Africa (62). Nevertheless, the incidence of disease in Madagascar increased sharply from the mid-eighteenth century with the growth of trade, notably from the 1870s when steamships facilitated the rapid movement of disease to the island from other regions of the globe. Its spread has also been linked to concentrated settlements of population, the more sparsely populated regions of the island, like the vast cattle-grazing plains of Sakalava land, being incapable of sustaining infectious diseases in endemic form, unlike the crowded ports and the densely settled valley bottoms and marshlands of the plateau interior (63). The last and arguably most important element influencing the spread of infectious diseases was imperial *fanompoana*.

The most important diseases to afflict people in nineteenth-century Madagascar were malaria, transmitted via the anopheles mosquito, and smallpox, syphilis and tuberculosis, all of which were transmitted directly. Any disease could be devastating to a community previously untouched by it or which had lost resistance acquired through previous exposure to it. Acquired resistance could be built up after exposure to malaria, smallpox and tuberculosis but not to venereal

(60) Baudin to Dubois, 25 août 1918, quoted in H.M. Dubois, "Les origines des Malgaches", *Anthropos*, XXII (1927), 96.

(61) Caldwell, "Major questions", 11; Wrigley, "Population and history"

(62) Rinderpest, for example, devastated cattle stocks and game over much of southern and eastern Africa from 1892, thereby significantly reducing food supplies and lowering resistance to disease. See Swanzie Agnew, "Factors affecting the demographic situation in Malawi in precolonial and colonial times", in *AHD*, I, 378; Marc H. Dawson, "Disease and population decline of the Kikuyu of Kenya, 1890-1925", in *AHD*, II, 126.

(63) As amongst the pastoral Maasai: see Dawson, "Disease and population decline", 126.

infections. Malaria presented a special case in that resistance could also be inherited with the sickle cell trait (64).

As on mainland Africa, malaria - endemic in most tropical areas and in region of high rainfall - was the major killer disease of all age groups on the plateau of Madagascar (65). The malarial cycle generally commenced with the rains in November, which left puddles affording the female anopheles mosquito ideal sites to lay her eggs. Clinical symptoms of the disease usually started to appear in the victim from one to four weeks after the onset of the rains and peaked in July. It was of particular demographic importance that a pregnant woman's acquired resistance to malaria decreases with the development of the pregnancy, heightening the risk of anemia, which was a frequent cause of neonatal death. Surviving babies were generally protected from the disease by foetal haemoglobin and antibodies from the mother up to their fourth month, so malaria most seriously affected infants aged three to five, notably between the end of the rainy and the start of the winter season when their physiological defences were often weakened by nutritional deficiency. However, malaria could seriously infect all age groups, especially when several years of poor rains and low malarial incidence, reducing the body's natural defenses against infection, were followed by a protracted rainy season (66).

(64) William H. Mc Neill, *Plagues and People* (New York, 1976), 3-12 ; Léonard Jan Bruce-Chwatt, *Essential Malariology* (London, 1980) 58-67 ; Jean Delmont, "Paludisme et variations climatiques saisonnières en savane doudanienne d'Afrique de l'Ouest", *Cah. Et. Afr.*, XXII (1982), 117-34.

(65) Nurse et al., *Peoples of southern Africa*, 19, 278-9 ; Ellis, *History of Madagascar*, I, 215, 217-19. Outbreaks of measles in Imerina in 1822-3 and 1884 resulted in some infant deaths, although whooping cough did not appear to have affected Madagascar as seriously as it did mainland Africa. See e.g. Agnew, "Factors", 378.

(66) Delmont, "Paludisme", 117-34 ; Paillard, "Recherches démographiques", 39.

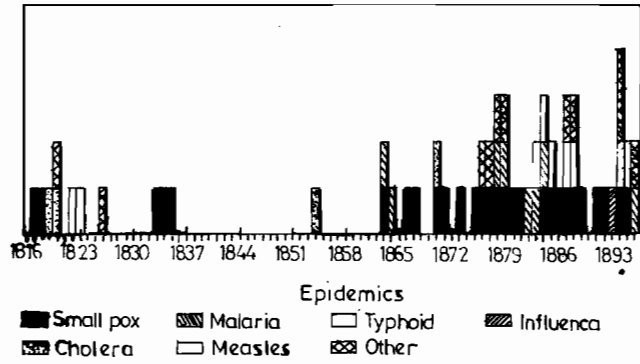


Fig. 4. Madagascar, frequency of disease 1816-96

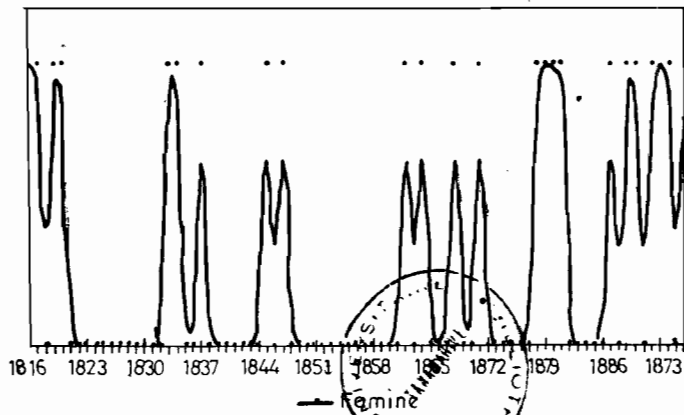


Fig. 5 Madagascar, frequency of famine 1816-96

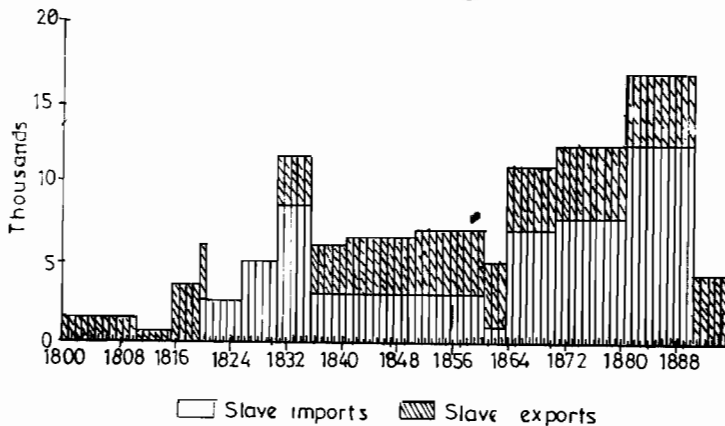


Fig. 6 Madagascar import and export of slaves 1800-95 (estimated)

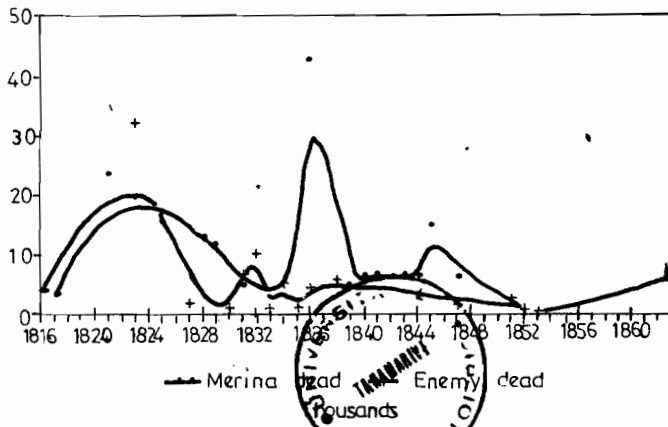


Fig.7. Merina military campaigns, estimated gains and losses 1816-63

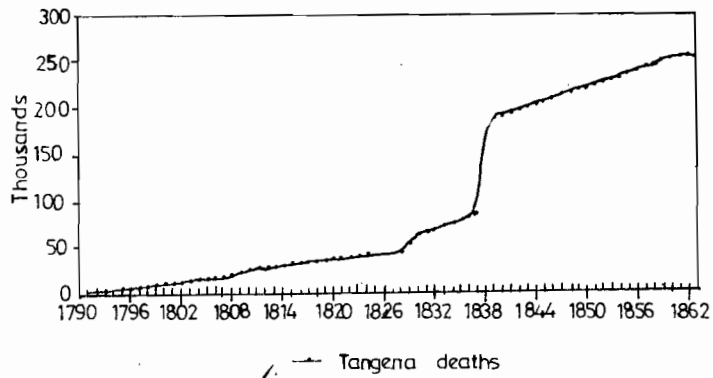


Fig.8. Imerina, estimated Tangena deaths 1790-1863 (cumulative)

Table 1. Famine and disease in Madagascar, 1816-96

Year	
1816	(Dec) Famine in Betanimena (north-east coast)
1817	Smallpox outbreak in Imerina
1819-20	Cholera (?)
1822-3	Measles outbreak in Imerina - several children die
1826	"A very extensive, and, in many instances, fatal malady, prevailed, both in the capital and in the neighbouring villages"
1833	Smallpox epidemic in northern provinces of Madagascar and Imerina (peak Nov)
1813-4	(Nov/Dec-Feb) More rain in Imerina than in living memory rice harvest spoiled
1834	Smallpox — causes great turmoil in Imerina Famine on north-east coast (Toamasina and Foulepointe) and Imerina (Sept)
1835	Smallpox — causes great turmoil in Imerina (Jan-Feb) Ban on swidden in eastern forest ; imperial ports kept filthy as state policy
1845	Famine on north-east coast
1847	Famine on north-east coast
1854	Cholera (?)
1862	Drought in northern Imerina (Ambohimanga). Crops fail and famine anticipated
1863	Smallpox and malaria (Imerina)
1864	Malaria continues to affect Imerina
1866-7	Mild form of smallpox affecting certain regions of Imerina
1870	Cholera epidemic in Mahajanga : 2,000 die between Oct and Dec
1873	Smallpox in Betsileo
1875-7	Smallpox outbreak in Toamasina where 800 + die and communications cut with the interior Smallpox spreads, affecting Vonizongo, Vakinankaratra, Ambohimara and Betsileo.
1878-9	Epidemic of <i>aretin'olona</i> (and/or malaria) — killed many on plateau Smallpox epidemic in Betsileo
1879	Malaria epidemic in Avaradrano
1880-1	Smallpox epidemic
1882	Typhoid in Toamasina
1882-3	Severe outbreak of typhoid and malaria in Imerina
1884	Small epidemic and outbreak of measles Severe outbreak of malaria after wettest rainy season for years Dancing mania in Marovatana provinces — to appease the dead

- 1885-8 Smallpox epidemic and typhoid
- 1889 Smallpox epidemic
(March) R. Ikopa threatens to flood Betsimitatatra rice plain in central Imerina
Outbreak of plague in Toamasina, Mahajanga and Antseranana
- 1890 Shortfall in rice harvest in Imerina — acute rice shortages
- 1891 Malaria and "other disease" widespread in Mandridrano region
Smallpox outbreak
- 1892 Smallpox epidemic in the Anonibe region of Betsimisaraka cultivation abandoned and famine ensues. Floods on north-east coast, destroy rice crop in Maroantsetra and Antongil Bay
- 1893 Influenza epidemic in Imerina — hundreds die
Cyclone in Toamasina region
- 1894 Influenza epidemic persists in Imerina
"Nervous fever" affects Imerina
Typhoid epidemic in Antananarivo
Cyclone destroys rice and banana plantations north-east coast, famine ensues
Smallpox hits Vohimara on north-east coast
- 1895 Smallpox outbreak in Toamasina
Typhoid outbreak in Toamasina
- 1896 Famine on east coast follows flight from land due to the outbreak of French hostilities in 1895
Malaria on plateau.

Smallpox (*variola minor*, or the more severe *variola major*) probably first hit southern Africa, including Madagascar, during the eighteenth century. Dawson quotes Leakey's estimate of a 5 to 10 per cent mortality in an epidemic that hit the pastoral Maasai in the early 1890s, although Ross put the death rate in an unvaccinated population at 40 per cent, and Chrétien placed it at between 50 and 70 per cent. Indeed, Chrétien argues that in East Africa, the demographic impact of smallpox and cholera combined was probably far greater than the slave trade, especially when they coincided with periods of famine (67). Such was the initial fear of smallpox in Imerina that its victims were driven from their villages and either stoned to death or forced into an open grave and buried alive. Increasing familiarity with the disease, notably a realization that survivors gained immunity to it, brought about a more tolerant official attitude to its victims. From the 1820s, they were obliged to retire to isolated huts until they had either succumbed to the

(67) Dawson, "Disease and population decline", 127-8; Robert Ross, "Smallpox at the Cape of Good Hope in the eighteenth century", in *AHD*, I, 416-28; see also Beachey, "Some observations", 369; Chrétien, "Démographie et écologie", 51, 55; Koponen, "War, famine and pestilence", 663-5; Nurse et al., *Peoples of southern Africa*, 18.

disease or had recovered (68). A series of smallpox epidemics in 1833-5 was responsible for depopulation in some central provinces, but attempts to introduce vaccination were opposed due to fear in court circles that Europeans wished thereby to infect the Malagasy with the disease (69).

All diseases appear to have increased in proportion to the extent and severity of *fanompoana* and other exploitative policies of the Merina state. As regards malaria, a high incidence of the sickle cell trait and the development of resistance through exposure offered some protection to the coastal peoples, although the latter entailed high mortality amongst children (70). By contrast, the peoples inhabiting the traditionally malaria-free central highlands possessed no acquired resistance or genetic defence against the disease, so that when they travelled to coastal regions, as increasing numbers did from 1817 with Merina expansionism, they proved almost as vulnerable to the disease as Europeans. An estimated 25 to 50 per cent of Merina soldiers in lowland provinces died each year, mostly of malaria, as did about 160000 Merina soldiers (close to Raombana's estimate of 150000 for the years 1820-53) in imperial campaigns between 1816 and 1853, giving an average of about 4500 soldier deaths per year (possibly 0.8-4.5 per cent of the Merina population) (71). The pace of military campaigning slackened radically from the early 1850s, so that an estimate of 235000 Merina military dead, mostly from malaria and famine, for the entire period 1800-95 would appear reasonable (72).

Although the incidence of malaria amongst Merina troops may have declined in the provinces from 1850, it increased on the plateau. Paillard asserts that only from 1895 was the plateau affected by malaria epidemics and that these were due to the social upheaval that followed the implantation of colonial rule (73). Certainly by 1905 the only area of the plateau free from malaria was Antsirabe, a town lying roughly half-way between Antananarivo and Fianarantsoa. However, missionary records demonstrate that epidemics of malaria and unspecified diseases that caused "hot fever" and other symptoms characteristic of malarial infection regularly afflicted the plateau from the late 1870s, a decade and a half

(68) Although isolation was still considered harsh because the Malagasy, like mainland Africans, normally incorporated their ill within a tight familial or community network. For a comparison of isolating the ill, see Maryinez Lyons, "From "death camps" to *cordon sanitaire* : the development of sleeping sickness policy in the Uele District of the Belgian Congo, 1903-1914", *J. Afr. Hist.*, XXVI (1985), 69-91.

(69) Freeman to Ellis, Tamatave, 3 Oct. 1833, and Vohitsara, 11 Oct. 1833, SOAS/LMS MIL B4 F4 JC.

(70) Bruce-Chwatt, *Essential malariaology*, 58-61.

(71) Although a staggering 72 per cent of the French expeditionary troops died of malaria in the Malagasy campaign of 1895 ; William B. Cohen, "Malaria and French imperialism", *J. Afr. Hist.*, XXIV (1983), 24-5 ; see also Campbell, "Slavery and fanompoana", 468-9.

(72) Campbell, "Slavery and fanompoana".

(73) Paillard, "Recherches démographiques", 38, 40

before the French conquest (74). The major reason for the spread of malaria to the plateau was increased state *fanompoana*, which resulted in the mass circulation of forced labour units, a feature often ascribed only to European colonial regimes, between the plateau and the forest and other malarial areas (75).

Secondly the imposition of security by the Merina state, from the end of the Merina civil wars in c. 1795 in Imerina and from c. 1820 in Betsileo, induced the plateau peoples to leave their fortified hilltop encampments for settlements in the cultivated valley bottoms (76). This move from an environment theoretically hostile to one friendly to mosquitoes was of little importance until the late 1870s, from which time absorption into, or flight from *fanompoana* led to the abandonment of large stretches of the irrigated riziculture network (77). Following the rice harvest it was customary in plateau region to drain the fields of water, but from the late 1870s water was increasingly left to stagnate due to labour shortages. As a result the stagnant water attracted the anopheles malaria vector from March-April until the fields were finally drained and dried in July, in the middle of the dry season (78). It is also significant that the incidence of malaria and similar unspecified diseases (79) increased sharply from 1884 to 1894, when Madagascar experienced unusually wet weather, often associated with malarial infection. In 1895 malaria caused 25 per cent mortality (80).

Stress, undernourishment and extreme fatigue, common under Merina state labour policies, lowered the body's defences to diseases, often permitting low-grade infections to become fatal (81). The same was true of alcohol consumption, which increased rapidly from the 1870s, reflecting both the immense social dislocation caused by *fanompoana* and the influx into all regions save Imerina of cheap Mascarene rum, which foreign merchants frequently insisted upon paying

(74) Campbell, "Gold mining", 99; Marriot, "Report (1905)", 6; also see Table 1 in text.

(75) Campbell, "Gold mining"; Campbell, "Missionnaires, fanompoana and the Menalamba Revolt".

(76) Dubois, *Monographie du Betsileo*, 623.

(77) Francis Maude, *Five years in Madagascar* (London, 1895), 103; Campbell, "Missionnaires, fanompoana and the Menalamba Revolt".

(78) See Paillard, "Recherches démographiques", 39.

(79) Like *safotany*, which afflicted chiefly Betsileo in the late nineteenth century although its victims apparently failed to respond to quinine: see Anon, "Dr Forsyth Major's expedition in Madagascar", AAMM, XX (1896), 493; D.M. Rees, "Y 'Safotany' na 'Raporapo'", *Y Croniel* (1898), 178-80.

(80) Ryder to Ropes, Emmerton & Co and Arnold Hines & Co, Nossi-Bé, 28 Feb. 1885, B44 F4 18 Oct. 1887, B45 F6; Laborde to Whitney, Antananarivo, 22 Jan. 1887, B44 F2. Whitney to Ropes, Emmerton & Co, Tamatave, 26 Jan. and 26 Feb. 1889, B45 F2, Tumball to Ropes, Emmerton & Co, Tamatave, 26 March 1890, B46 F5; Duder Dawson [Antananarivo], 28 June 1891, B46 F4; Ryder to Ropes Emmerton & Co, Tamatave, 28 July and 27 Aug. 1893, B45 F7; Ryder to Ropes Emmerton & Co, Tamatave, 6 April 1894 B45 F7 - REC/CR MZL; Paillard, "Recherches démographiques", 38, 40.

(81) McNeill, *Plagues and People*, 16; see also Campbell, "Adoption of autarky", 403; Grandidier, *Histoire*, vol. 4, t. 1, 339; Paillard, "Recherches démographiques", 38.

for Malagasy cattle exports. Imported rum supplemented the ubiquitous locally produced *toaka gasy* spirit (82).

From the 1820s the state also played a major role in causing food shortages, which in turn lowered resistance to disease. During the early nineteenth century, the main impact of *fanompoana*, and subsequently of impoverishment and famine, was felt more in subjected forest and coastal provinces than on the plateau (83). This trend changed from the 1870s, when food shortages became frequent also on the plateau, where, as in the early colonial Congo Free State and French Congo, unremitting forced labour resulted in insufficient time being left for people to devote to subsistence agriculture. As a British visitor commented of *fanompoana*: the result is always the same. "The Queen honours "Raini-bé" or "Bootoo" by taking him away from his rice fields just at the season when his labour and supervision are most required for his crop (84).

Especially, significant in reducing food production was the large-scale drafting of women, the backbone of the agricultural labour force, into state goldfields from the early 1880s. The situation was complicated in Betsileo by the loss of large section of cultivated territory given as security to Merina usurers. Bankrupt Betsileo faced enslavement, so the majority fled to join outlaw bands, composed largely of refugees from *fanompoana*, who survived largely by raiding villages —thus completing a vicious circle of exploitation and peasant abandonment of cultivation. Flight was critically damaging to plateau agriculture, which, unlike the fishing, pastoral and swidden economics of most other regions of the island, was based upon a highly sophisticated and labour-intensive system of hydraulic riziculture, that required production units of at least a minimum size to ensure its viability. Although most communities stored sufficient crops to withstand short-term dearth, that system was rendered increasingly untenable from the late 1870s through being deprived of sufficient labour (85).

Impoverishment and famine were complicated on the plateau by cold winters and inadequate clothing, which made ordinary people, notably the very young and old, highly susceptible to influenza, bronchitis and related diseases. hundreds perished in the influenza epidemic of 1894-5, and it is possible that nineteenth-

(82) By 1880 Mascarene rum was retailing for \$0.25 per quart on the east coast and \$0.30 in the interior; Johnson to FM, Faravohitra, 19 Okt. 1889, H114-ANM; LMS, *Ten years' review of mission work in Madagascar, 1880-1890* (Antananarivo, 1890), 114; see also W.C. Clarence-Smith, "Capital accumulation and class formation in Angola"; in Birmingham and Martin (eds.), *History of Central Africa*, II, 167, 174; "Ny toaka avy tany Morosy", in *Ny Gazety malagasy*, 1 (n° 4) (2 aug. 1876); 13; LMS, *Ten years review of mission work in Madagascar, 1870-1880* (Antananarivo, 1880), 31-4.

(83) See e.g. RA, 263, 322 and RH, 136-7.

(84) Maude, *Five years in Madagascar*, 103.

(85) Campbell, "Missionaries, fanompoana and the Menalamba revolt"; Campbell, "Gold mining"; Dubois, *Monographie des Betsileo*; see also Koponen, "War, famine and pestilence"; 644-7; Joseph C. Miller, "The significance of drought, disease and famine in the agriculturally marginal zones of West-Central Africa", *J. Afr. Hist.*, XXIII (1982), 17-32.

century rates were similar to those of the early colonial era, when in Antananarivo, for example, between April 1900 and March 1901, 13,1 per cent of deaths were flu-related and 33,29 per cent bronchial in comparison to 7,51 per cent malaria-related (86).

The plateau was also largely unforested, so that ordinary people were denied the variety of fruits and roots to which peoples in the wooded lowland regions had access (87). This combination of such climatic and dietary factors accentuated by unsanitary conditions in forced labour camps, facilitated the spread of disease. Only in the case of smallpox did the state take preventive action. At the start of the second smallpox pandemic of 1884-9, which followed one of 1875-81 in which thousands of plateau people had died, parents were ordered to present their children to be vaccinated on pain of a \$0,025 fine (88). However, smallpox continued to spread, epidemic breaking out in Betsileo in 1886 and on the north-east coast from 1892. Moreover, the impoverishment of the population, coupled with the state ban on sanitary measures in order to cultivate an environment of disease that might help deter European invasion, led to the appearance of cholera and typhoid in the main towns of the Merina empire. Cholera was first noted in 1819-20 and again affected Madagascar in 1854, but it did not have a drastic demographic impact until 1870, when an epidemic from the Swahili coast killed between one-third and one-half of the population of Mahajanga (89). Also, from 1882 the island's two largest towns, Toamasina and Antananarivo, were regularly hit by typhoid. In the midst of a particularly vicious outbreak in Antananarivo in 1894. Fenn, a Quaker doctor, commented: "I do not exaggerate [sic] when I say that hundreds die of Typhoid fever every year, many, perhaps most, of whom might be saved if the city were cleaner, less crowded and the killing of oxen were prohibited within the limits of the town" (90).

WARFARE AND THE TANGENA

A Catholic mission report in 1860 noted a falling population due largely to the ravages of imperial Merina campaigns and the state-sanctioned *tangena* poison

(86) Paillard, "Recherches démographiques", 36. In the Fianarantsoa region of Betsileo from 1932 to 1946 respiratory diseases accounted for 33,28 per cent of all hospitalized patients (behind malaria at 43,80 per cent), once the plague, which became a serious affliction only during the colonial era, is discounted (bronchial pneumonia and pneumonia accounted for 53 per cent of all respiratory cases); Ralinoro, "Le problème démographique", 733-4; Dubois, *Monographie des Betsileo*, 1041-2; see also Shaw, "Towards a prehistoric demography of Africa", 584-5.

(87) Oliver, *Madagascar*, I, 459; R. Toy, "Remarks on the meteorology of Antananarivo and the neighbourhood", *AAMM* (1878), 73ii, 74ii.

(88) Ellis, *History of Madagascar*, I, 215, 217-19, 227; David Griffiths, *Hanes Madagascar* (Machynlleth, 1843), 64-5; *The Madagascar times*, II (n° 41) (15 Okt. 1884), 379.

(89) Koponen, "War, famine and pestilence", 661-2, 671.

(90) Fenn to PM, Isoavinandriana, Antananarivo, 23 Feb. 1894, III 18, 552-3, ANM; see also Maude, *Five years in Madagascar*, 28; *The Madagascar Times* (16 April 1884)

ordeal (91). Traditional warfare was probably the least demographically important cause of death, both because it generally affected only males, who are biologically expendable (92), and because it normally took the form of a ritual game which cost few lives, despite the influx of European musketry in the eighteenth century (93). Again, the nineteenth-century Merina state altered the pattern in favour of higher casualties, as their adoption of European military techniques, as well as weapons, and their programme of imperial expansion, increased battle fatalities until 1852, when their expansionism waned dramatically. Probably about 60000 non-Merina (1622 per annum) were killed by Merina troops between 1816 and 1853, whilst deaths resulting directly from battle were negligible on the Merina side because the latter enjoyed immense military and numerical superiority. indirect "military" mortality was high owing to famine that resulted from a combination of the enemies' scorched earth tactics, the refusal of the Merina state to provision its troops and diseases spread through the dense populations of army camps by malnutrition and insanitary conditions (94).

Delivré claims that the *tangena* poison ordeal was introduced into Imerina in the late eighteenth century, probably from Sakalavaland, and that except for a few years in the late 1820s it was used until 1861 as the chief means by which the ruling élite dispensed justice and eradicated rivals in politics and wealth (95). Raombana stated that the *tangena* "was but partially administered as a matter of state policy, that the people may reverence their Kings by making them suppose that they are in possession of a Divine or sacred Thing capable of finding out those who commit the most heinous crimes, and indeed so convinced were then the people of the sacredness of the Tangena ordeal... that in Law-suits they prefer their cases to be decided by it, than to be judged by the Testimonies of eye witnesses, and even those who losses [sic] their cases, although they are evidently in the right, shows [sic] no signs of disgust at the Tangena ordeal for having judged unjustly, but ascribe their defeat to some just hidden mysteries unknown to them and which are only known to the Tangena ordeal". (96)

(91) Anon., "Madagascar et côte orientale d'Afrique" (1860), c.llg. AIIVP, 6, see also Dalmond, "Mission apostolique de Madagascar, 1837-1847", Diaries section II, 1, AIIVP ; Robequain, *Madagascar*, 110.

(92) Wrigley, "Population and history", 23 ; the same point applied to the slave export trade to the Americas, in which two to three males were exported to every female ; see John Thornton, "The demographic effect of the slave trade on western Africa 1500-1850", in *AHD*, II, 694-5.

(93) See Dubois, *Monographie des Betsileo*, 616 ; Gerald M. Berg, "Sacred acquisition Andrianampoinimerina at Ambohimanga, 1777-1790", *J. Afr. Hist.*, XXIX (1988), 208-9 ; see also Koponen, "War, famine and pestilence", 650-1, 654.

(94) Campbell, "Adoption of autarky".

(95) Alain Delivré, *L'histoire des rois d'Imerina* (Paris, 1974), 188, 387 ; Raymond Delval, *Radama II : prince de la renaissance malgache 1861-1863* (Paris, 1972), 43-5, 431, 892-3 ; Griffiths, *Hanes Madagascar*, 24-5.

(96) RH, 42.

In Imerina the lethality of the *tangena*, which was generally given to suspects of free status only after fowl and dog substitutes for the accused had already succumbed to the poison, varied according to the amount of poison given, which in turn depended upon the designs of the court administrator. It was applied mainly in cases of suspected witchcraft and sorcery. Wrigley considers witch manias to be a reflection of the rage of a male-dominated power structure against women and procreation and therefore a device to limit population growth (97). In Madagascar, however, the persecution mania was applied to both females (witches) and males (sorcerers). Manning " considers the resurgence of witchcraft accusations and executions to be an example of both the declining value of humans and the psychic pressures on societies facing conquest" (98). Certainly many *tangena* victims, like the Christians between 1835 and 1861, were accused of undermining Merina sovereignty and promoting European interests in the island (99). However, the slaves, who constituted the major victims of the *tangena*, were mostly owned by the Merina élite and could not have posed such a threat. Rather, when illness, misfortune, or death befell a master, there was cause for suspicion to fall on the slave. For example, when Andriantsovatra, the niece of Ranavalona I, queen of the Merina state from 1828 to 1861, died of whooping cough, her slaves were immediately accused of witchcraft; and large numbers of them died after having been given the *tangena*. Most slaves of the élite were subjected to the *tangena* several times in the course of their lives : in 1854, it was estimated that all slaves who had served Ranavalona I since the commencement of her reign in 1828 had survived at least seven such ordeals (100).

In total, Griffiths estimated an average fatality rate from *tangena* of 33 to 50 per cent (101). It has been estimated that the poison killed an average of 1000 people (possibly 0,44 per cent of the population) per annum in the early 1820s, rising to 3000 a year (possibly between 0,43 and 2 per cent of the population) from 1828 to 1861, although its effects in individual cases and years could be much higher ; in 1838 it killed an estimated 20 per cent of the population of Imerina (possibly 100000 people) (102) and 85 per cent of the 163 Tantsaha subjected to the ordeal in one case alone in 1853 (103). If three-quarters of the victims were

(97) Wrigley, "Population and history", 24.

(98) Manning, "Countours of slavery", 856.

(99) Campbell, "Role of the London Missionary Society", 344-64.

(100) Griffiths, *Hanes Madagascar*, 24-5 ; Ellis, *History of Madagascar*, I, 114 ; James Sibree, *Madagascar and its People* (London, 1870), 384.

(101) Griffiths, *Hanes Madagascar*, 24-5.

(102) Daniel Tyerman and George Bennet, *Journal of Voyages and Travels, 1821-1829*, ed. James Montgomery (2 vol.) (London, 1831), III, 515 ; Johns to Jones, Antananarivo, 1 July 1830, 19157E-ALGC ; Sibree, *Fifty years*, 35 ; Decary, "La population de Madagascar", 30 ; Grandidier, *Histoire*, vol. 4, t. I, 327 ; J.A. Lloyd, "Memoir on Madagascar" (10 Dec. 1849), *Journal of the royal geographical society*, XX, (1851), 66.

(103.) Raombana, "Manuscrit écrit à Tananarive (1853-1854) ; trans. J.F. Radley, *BAM*, XII (1930), 6, 15.

slaves, *tangena* deaths would have accounted for about 1 to 4,5 per cent of the slave population of Imerina per annum (104). Officially abolished in 1863, the *tangena* ordeal continued to be practised in clandestine form in some Merina regions and openly elsewhere in the island (105).

All the above factors contributed to a death rate for imperial Madagascar which was probably higher than that of the early colonial era when, in 1903, it averaged 26,3 per thousand for Madagascar and 35,0 per thousand for central Imerina. This was nevertheless lower than the crude death rate of 4 per thousand posited by Caldwell for pre-colonial tropical Africa and may indicate that in imperial Madagascar the crude birth rate, which was significantly lower than that posited for the rest of sub-Saharan Africa, was of greater significance in maintaining population stability than the crude death rate (106).

IMMIGRATION AND EMIGRATION

The state also greatly influenced migration. Much immigration and emigration were accounted for by the movement of slaves. In contrast to West Africa, where domestic slavery expanded from the close of the slave expose era in 1860 s, domestic slavery and slave exports in East Africa increased simultaneously throughout the nineteenth century (107). However Madagascar which played a significant role in the prolongation of the East African slave trade, was possibly unique in that it experienced a significant slave traffic both into and out of the island (108).

Whilst the Merina state played little role in the slave export trade after its 1820 ban on sending slaves abroad, it continued to play a major role in slave

(104) Griffiths, *Hanes Madagascar*, 24-5 ; Ellis, *History of Madagascar*, I, 114 ; Sibree, *Madagascar and its People*, 384.

(105) Dumaine, "Voyage au pays d'ancove, autrement dit des Bezounzouns, Isle de Madagascar" (Juillet 1790), Bl. Add; 18128, 275 ; Chapelier, "Lettres" adressés au citoyen préfet de l'île de France de décembre 1803 à mai 1805" (M. July éd.), *BAM*, (1905, 6), 53 ; Richardson, "Tanala customs", 95, 97 ; Raombana Bk 2, livre 13, 27 ; *LMS Ten years' review* (1880), 34-5.

(106) Grandidier, *Histoire*, vol 4, t. I, 342-3 ; Caldwell posits a life expectancy of 22 years for pre-colonial tropical Africa, higher than Pool's figure of twenty years but significantly lower than the 27,5 years incorporated into the "South" model of Coale and Demeny adopted by Thornton ; Caldwell, "Major questions, 10 ; Pool. "A framework", 53-4, Thornton, "Slave trade", 420.

(107) Manning, "Contours of slavery", 841-3 ; Abdul Sheriff, *Slaves, Spices and Ivory in Zanzibar* (London, 1987) ; Paul E. Lovejoy, *Transformations in slavery* (Cambridge, 1983), 150-3.

(108) Gwyn Campbell, "Madagascar and Mozambique in the slave trade of the Western Indian Ocean, 1800-1861", W.G. Clarence-Smith (ed.). *The Economics of the Indian Ocean Slave Trade in the Nineteenth Century* (London, 1989), 166-93 ; Campbell, "The east african slave trade", 1861-1895 : the "southern" complex". *Int. J. Afr. Hist. Studies*, XXII (1989), 1-27 ; Campbell, "Madagascar and the slave trade", 203-27.

imports. About 290000 slaves were exported from Madagascar under various auspices between 1801 and 1891, giving an average of 3,222 per annum (possibly 0,16-0,05 per cent of the population) (109). It is highly unlikely that, as in many regions of mainland Africa, drought and famine reduced families to selling members into slavery, although hard times did force people to migrate from protected locations to areas where they became more vulnerable to capture. Impoverishment also reduced the defensive capabilities of rural communities and increased the flow of men into brigandage, in which many made their living from slaving (110). Slave imports, which commenced from 1820, totalled approximately 420,000 by 1891, representing an average inflow of 5916 per annum. Fluctuations in slave imports, which peaked in 1826-40 and 1863-90 (approximately 7326 and 9264 per annum respectively) were greater than those for exports, which remained relatively steady in the range of about 4000 per annum in most periods. From the early 1870s estimates show a significant cumulative surplus in imports, although the net gain in population was smaller, as a considerable proportion of the slaves imported from Africa were re-exported to the French plantation islands as indentured *engagés*. Non-slaves also emigrated; between 1824 and 1846 some 15000 Malagasy, mainly Sakalava, fled to Nosy Be and other islands off the north-west coast, whilst between 1831 and 1851 an estimated 8,750 Betsimisaraka migrated to Nosy Boraha, off the north-east coast (111).

In considering slave demography in Madagascar, the number of potential captives killed in slave raiding and of captives who died en route to the coast, must also be taken into account. If Manning's 1983 estimate (1667 per cent mortality during enslavement for the Atlantic trade in West Africa) rather than his 1981 estimates (10 per cent mortality) is applied proportionately of Madagascar, approximately 48343 people, averaging 681 a year, would have died during enslavement and export from 1820 to 1891 (112). On this basis the net population gain for Madagascar from the external slave trade would have been small: possibly 1750 per annum in the late 1860s, rising to 2500 in the 1870s and peaking at a maximum of c. 7000 a year in the 1880s (i.e. discounting enslavement losses).

(109) Campbell, "Madagascar and Mozambique", 185; Campbell, "East African slave trade", 25.

(110) Manning, "Contours of slavery", 850; Miller, "Significance of drought", 30; Campbell, "Missionaries, fanompoana and the Menalamba revolt", 54-73.

(111) RA, 263; Raombana Bk 2 livre 13, 22; Campbell, "Role of the London Missionary Society", 338-9; Wolf, "Analysis", 203; *Madagascar Times* (5 Nov. 1884); Grandidier, *Histoire*, vol. 4, t. I, 297; Horace P. Putnam "A cruise to the Indian Ocean and a life on shore", in "La Plata seaman's journal" (Dec. 1848 to Jan. 1850), Long. 1847 W3 B45, Ms, 1847, W3. Essex Institute; A. Smith, "From Zanzibar to Nosibe", AAMM, VII (1883), 41; Dalmond à son frère, Madagascar, 1 fev. 1840, in "Lettres de M. Dalmond à ses parents entre 1826 et 1846", C 47, AHVP; Finaz au P. Jouen, Nossi-bé, 20 juillet 1846, Correspondance C35, AHVP; Nourse to Farquhar, HMS Andromache, 17 nov. 1822, CO 167/66.

(112.) Manning, "Demographic model", 371-84; Manning, "Contours of slavery", 850.

In addition to a proportion of the Africans imported as slaves into Madagascar, the central province of Imerina received approximately 120000 local non-Merina captives enslaved in imperial military expeditions from 1816-1863, after which imperial slave raiding virtually ceased (113). Most of these slaves were maintained by the Merina state and élite in central Imerina, particularly Antananarivo, where, together with African slaves, they formed two-thirds of the population. The city's slave population dropped sharply in the dry season as many porters who totalled 60000 by the 1890s —and slaves accompanying their masters on military expeditions left town (114). Such seasonal variations probably account for some of the heavy fluctuations in observers' estimates of the population of the city. As relatively small numbers of Merina migrated permanently to non-plateau regions, it is likely that in total Imerina gained about 250000 through forced immigration up to 1850, notably between 1823 and 1837, and about 112500 between 1850 and 1895.

The influx of slaves did not necessarily boost the rate of natural population increase within the Merina empire. Firstly, some African slaves brought deadly

(113) Dalmond, "Mission Apostolique de Madagascar, 1837-1847", 27, 94-5 ; Johns to Freeman, Antananarivo, 14 oct. 1830, SOAS/LMS MIL, B3 F5 ; Hastie, "Diary" (1817) ; Hastie, "Diary" (1820), 468-71, 500 ; Hastie, "Diary" (1822), CO 167/63 ; Hastie, "Diary" (1824, 5), 89-90 CO 167/78, II : Pye. "A summary of the proceedings at Madagascar from 6th June to 14th June 1817 ; CO 167/34 ; RH, 68, 79, 130-1 ; RA 217-19, 244-6, 279-80, 285-6, 291, 369-71, 373, 377, 390, 292-3, 473-5 ; Raombana, vol.VIII, B1, t. 8 ; Raombana, Bk 2 livre 13, 6, 31, 34-5 ; Raombana, "Annales", Livre 12, CI, 488-9, 507-509 ; Raombana, "Manuscrit écrit à Tananarive", 15 : [Jouen]. "Journal" (1853), C28f. ANM, 3-4, 6, 11 ; R.E.P. Wastell, "British imperial policy in relation to Madagascar, 1810-1896" (Ph. D. thesis. University of London, 1944), 224-6, 232 : Oliver, *Madagascar*, I, 64-7 ; Prud'homme, "Observations on the Sakalava", AAMM, XXIV (1900), 416-20, 422-3 ; Baker to Stanley, "Memorial" (Antananarivo, 1832), SOAS/LMS MIL B3 F4 JC ; Rahaniraka and Rafaralahy to Arundel, Antananarivo, 14 Aug. 1832, SOAS/LMS MIL, B4 F3 JA ; Johns & Freeman to Ellis, Antananarivo, 29 May 1833, and Freeman to Philip, Antananarivo, 26 Aug. 1832. SOAS/LMS MIL B4 F4 JB ; Baker to Ellis, Tamatave, 15 July 1834, SOAS/LMS MIL, B5, F1 JC : Freeman to Ellis, Antananarivo, 18 May 1835, SOAS/LMS MIL, B5 F2 JA ; Johns to Ellis, Antananarivo, 26 March 1836, SOAS/LMS MIL, B5 F3 JA ; Johns to LMS, Tamatave, 30 June 1838 and 6 Aug. 1838, SOAS/LMS MIL, B5 F3 JB ; Ellis, "History of Madagascar", II, 252, 287, 316-17, 357-8, 359, 367 ; John E. Ellis, *Life of William Ellis* (London, 1873), 280 : William Ellis, *Madagascar Revisited* (London, 1867), 347-8 ; Griffiths, *Hanes Madagascar*, 55, 61, 64, 87, 130 ; Jean Valette, *Etudes sur le règne de Radama 1er* (Tananarive, 1962), 7-8, 16-17, 47, 54-6, 59-60 ; E. Vidal, *Madagascar : situation actuelle* (Bordeaux, 1845), 10 ; David Jones, "Journal" (1820), "Madagascar journals : Madagascar and Mauritius (1816-24)", FtA SOAS/LMS ; A. Boudou, "Journal de route d'une expédition de Rainimaharo en 1838", *BAM*, XV (1932), 89-90 ; Tyerman and Bennet, *Journal of voyages and travels*, 511, 514 ; Edmond Samat, "Renselgnements sur la côte ouest de Madagascar depuis Nossi-Bé jusqu'à Crosker Cap Ste Marie" (Nossi-bé, 6 Mai 1852), in A. Boudou, "La côte ouest de Madagascar en 1852", *BAM*, XV (1932), 64, 74-5 ; Raymond Decary, "Contribution à l'histoire de la France à Madagascar", *BAM*, XXXI (1953), 56-8 ; M. Decary et H. Deschamps, "Comments", in Philippe Decraene, "Madagascar en avril 1971", *CRASOM*, XXXI (1971), 249, 251 ; Anon., "Notice sur les Sacalaves du Boény et de l'Ambongo" (n.d.), sect. II, C8, ANM ; *Notices statistiques sur les colonies françaises*, IV : *Madagascar* (Paris, 1840), 9-10 ; Delval, *Radama II*, 95, 793-800, 811.

(114) Campbell, "Labour and the transport problem", 341-356 ; Campbell, "Slavery and fanompoana", 468-73.

diseases with them, as was the case with the 1888 smallpox outbreak in Maintirano (115). Secondly, the slave population failed to reproduce itself. Like most slave communities elsewhere, with the exception of the United States and possibly of West Africa from the mid-nineteenth century, that of Madagascar experienced low birth and high mortality rates (116). Female slaves in Madagascar were sexually isolated, as not only was there a sharp sexual division of slave labour but, contrary to most of tropical Africa (117), a rigid caste prohibition existed against sexual relations between slaves and the "free" population; for example, in December 1855 Queen Ranaivalona I had a servant girl stoned to death for sleeping with a "Mozambique" slave (118). Some free males took slave concubines, but the incentive for female slaves to reproduce was limited, as all offspring of slave women were ascribed slavestatus, whilst after death a slave's property passed to her owner rather than to her children (119). Also, sexual unions between slaves could not gain the legitimacy of a marriage contract and were thus inherently unstable. A popular saying concerning slaves was that "*Hivady tsy toinona, ary hisaraka anio hiany*" (It's not their concern to get married for they could be separated the very same day). Further, when presented with the opportunity of gaining freedom, most slaves rejected manumission for fear of being subjected to *fanompoana* (120). Such factors inevitably limited slave reproduction, slaves sometimes preferring to invest in other slaves rather than in children of their own (121). In addition, as already noted, slaves were the most frequent victims of a *tangena* poison ordeal. Slave mortality may also have been increased in Betsileo by the tradition there of burying slaves of prince alive when their masters died—but the persistence of this custom into the nineteenth century is uncertain (122).

Contrary to Bloch's claim (123) that slave numbers increased steadily from the 1820s to reach 50 per cent of the population by the late nineteenth century, n



(115) Knott to Aitken, Mojanga, 21 March 1888, in *Anti-slavery reporter* (Nov. & Dec. 1888), 217.

(116) Manning, "Contours of slavery", 833-4. See also A Klein, "The demography of slavery in western Soudan: the late nineteenth century", in Cordell and Gregory (eds.) *African population and capitalism*, 56-7.

(117) See e.g. Manning, "Contours of slavery", 847-8.

(118) (Finaz), "Tananarive, capitale de Madagascar: séjour d'un missionnaire catholique en 1855, 56 et 57". *Diaires* section II, n° 20, AHVP, 110.

(119) Dubois, *Monographie des Betsileo*, 585, 718.

(120) Campbell, "Slavery and fanompoana", 463-86; see also Klein, "Demography of Slavery", 56-7.

(121) Klein, "Demography of slavery", 59-60.

(122) Dubois, *Monographie des Betsileo*, 571.

(123) Bloch appears to follow Raison, who states that in the period 1833-62 the number of slaves increased fivefold in Imerina, where by the latter date they formed 66 per cent of the population, dropping to 50 per cent by 1896; Françoise Raison, "Les Ramanenjana; une mise en cause populaire du christianisme en Imerina, 1863", *ASEMI*, VII (1976), 284; Maurice Bloch, *Placing the dead* (London, 1971), 71; Bloch, "Modes of production and

the evidence suggests that slave numbers grew only until the mid-1830s and then remained fairly stationary. Grandidier states that in 1869 two-thirds of the population of Antananarivo were slaves, but the overwhelming body of historical evidence indicates that outside the capital slaves formed about one-third of the population — although the proportion might have been temporarily high when large numbers of the free population had been conscripted into, or had fled from, *fanompoana* (124). Of the half million slaves liberated in 1896, 43.6 per cent lived in Imerina, where they formed 20-26 per cent of the population — half the unsubstantiated figure claimed by Bloch (125).

Most male slave exported from Madagascar originated either in west coast societies or came from Mozambique, and the majority passed via west coast entrepôts to the French plantation islands of the Indian Ocean. Female slaves, most of whom originated from the central highlands, would have been in greatest demand in the Muslim markets of the Comoro islands, with some possibly being sent on the Middle East, for West Africa. Inikori estimates a 33 : 67 and 60 : 40 male-to-female slave export ratio to Muslim countries and to the New World respectively (126), and similar ratios may have been mirrored in the Malagasy trades to Muslim and French markets. However, on the plateau where a significant number of young adult plateau males were either conscripted into *fanompoana* or became brigands, slave raiding by the Sakalava and Bara is likely to have resulted in an efflux from that region of mostly young adolescent males and women captives aged 14-30, young children being excluded because of the need of slave raiders for mobility (127). The export of female slaves would have lessened the sexual imbalance in the Merina population resulting from the losses of males, so that polygamy, quite common in the early nineteenth century, decreased that from its middle decades independently of the influence of missionary advocacy of Christian monogamous unions (128). In addition, sales of women would have reduced the number of births amongst the "free" population, thus heightening labour shortages,

slavery in Madagascar", in James L. Watson (ed.), *Asian and African systems of slavery* (Oxford, 1980), 110.

(124) Finaz, "Tanaranarive", 112-13.

(125) See previous note : see also Alfred Grandidier, "Souvenirs de voyages, 1865-1870" (1916); *Documents anciens sur Madagascar* (Tanaranarive, n.d.), 32 ; Hastie, "Diary" (1817), 250-1 ; Campbell, "Madagascar and the slave trade", 209 ; E.C. André, *De l'esclavage à Madagascar* (Paris, 1899), 186 ; Berthier, "La tribu des Hova", *Conférence à l'Ecole coloniale* (Paris, déc. 1908), 3 ; Grandidier, *Histoire*, vol. 4, t. I, 333 ; *Le journal* (8 oct. 1895).

(126) Inikori, "Under-population", 304.

(127) Campbell, "Madagascar and the slave trade".

(128) Until the late 1860s there existed "wife markets", such as that at Ilafy, 9 km north of Antananarivo, but it is not certain whether these were signs of an overabundance or of a shortage of women : RH, 7. Also, some evidence suggests that polygamy possibly depressed fertility slightly, except in cases where postpartum abstinence was the rule ; Hunt, "Le bébé en brousse", 407 ; see also Pool, "A framework", 53 ; Kitching, "Proto-industrialisation", 229-30 ; Manning, "Demographic model" ; 379 ; Kenneth Swindell, "Domestic production, labour mobility and population change in West Africa, 1900-1980", in *AfID*, II, 682 ; Ellis, *History of Madagascar*, I, 167-8.

increasing the demand for slave imports and further impoverishing the traditional agricultural sector (129). The impact of the slave export trade would have been different for the island as a whole. As many females captured in the central highlands were retained as slaves by the Sakalava, and the greatest external demand for Malagasy slaves was for males to work on the neighbouring French sugar islands, men probably comprised the majority of plateau slaves exported, so that the slave trade would have probably skewed the sex distribution of the total Malagasy population in favour of women. These processes would have contributed to the preponderance of females reflected in the 1899 French census, which showed a sex ratio of 778 males for every 1,000 females (130).

CONCLUSION

Two main schools of African historical demography divide supporters from critics of the demographic transition theory, which holds that the pre-colonial sub-Saharan African populations grew minimally or not at all over the long term but then began to increase with the advent of security and medical services brought by the colonial regimes of the twentieth century. Critics of this theory argue for a historical tendency for African populations to expand, which was thwarted in the pre-colonial era by the slave export trade and still in the early colonial era by wars of colonial conquest. European-carried diseases, and capitalist dislocation of the "traditional" sector. The available evidence relating to nineteenth-century Madagascar would suggest that whether population is related to employment demand or to land, the island was under-populated, as not only did it experience a chronic shortage of labour from the mid-1820s, but it also possessed sufficient agricultural land, exploited by the existing technology, to support a larger population (131). For demographic transition theorists, the lack of population growth in such circumstances is explicable in terms of "secondary" demographic influences such as protracted warfare, disease and climatic change. Thornton assumes that such factors lowered the pre-colonial population growth rate for eighteenth-century Angola to two per 1000 (132) a rate comparable to what the evidence shows could have characterized nineteenth-century Madagascar.

However, it is here contended that the assumptions characteristic of the debate surrounding the demographic transition theory establish a false dichotomy both between "natural" and human forces acting upon population growth and between the pre-colonial era, the state, although its impact differed over time and worked through, rather than being opposed to, natural forces affecting population

(129) Campbell, "Madagascar and Mozambique" ; Campbell, "East African slave trade".

(130) Paillard, "Recherches démographiques", 33.

(131) See Inikori, "Under-population", 286-9.

(132) Thornton, "Slave trade", 420 ; Thornton, "Demographic effect", 696, 709 ; see also Inikori, "Under-population", 290-1, 295.

growth. The early Merina state of the late eighteenth and early nineteenth centuries, stimulated by two major drought-induced famines, expanded food production through the extensive development of irrigated riziculture techniques. A growth in population and the creation of a sound basis for further economic growth and military expansion resulted. However, critical to this expansion was state control of labour, and it was the intensification and self-destructive involution of state exploitation of labour resources under the later Merina regime from the 1820s which limited demographic growth in Madagascar up to the French takeover. In this later period, Merina military expansionism might initially have led to demographic gains for the plateau at the expense of the societies of the east coast. However, unremunerated forced labour, characteristic of the Merina regime, had negative demographic consequences, while slave imports, although considerable, were neither channelled into the small farmer sector from 1820 nor did they reduce the state demand for forced "free" labour, because the slave community failed to reproduce itself (133). Indeed, imperial Merina state development projects on the plateau, like some "capitalist sectors" under colonialism, absorbed such numbers of "free" labour as to imperil the "traditional" agricultural sector, notably from the late 1870s, leaving the "peasant" exposed to greater threats of famine and disease.

This changing interaction of "natural" elements and state policies in shaping the demography of nineteenth-century Madagascar raises the possibility that other African societies in the pre-colonial era may have been similarly affected by a combination of "natural" and human factors. In particular it suggests that a re-examination of indigenous political forces and policies may shed new light on historical demographic patterns prior to colonialism.

(133) Campbell, "Madagascar and the slave trade"; Campbell, "Slavery and fanompoana", 475-7.

FAMINTINANA

Ity lahatsoratra ity dia manadihady momba ireo toe-javatra samihafa nahatonga ny fitomboan'ny mponina teto Madagasikara tamin'ny taonjato faha-19 sady mampiseho koa ny endrik'izany fitomboana izany.

Karazana tombatombana ihany no tokony hiheverana ireo tarehy marika nomen'ireo mpandinika — izay tandrefana ny ankabeazany — tamin'io fotoana io. Na dia izany aza, noho ny tsy nahitana statistika mihitsy tamin'io vanim-potoana io, dia ireo no tahirin-kevitra tsara indrindra ananantsika hatramin'izao, mampiseho ny endriky ny fitomboan'ny mponina tamin'ny taonjato faha-19. Ity lahatsoratra ity dia mampiseho fa raha ireo toe-javatra "voa-janahary" sy "avy amin'ny olombelona" nanova ny rafitra mikasika ny mponina no jerena dia ny ezaka nataon'ny fanjakana merina no navesa-danja indrindra. Ny politikan'ny mpanjaka Merina tamin'ny taonjato faha-18 dia namporisika ny olona hanitatra ny fambolena ka nitombo isa araka izany ny mponina. Niova tanteraka kosa izany nanomboka tamin'ny taona 1820 tany ho any fa ny hanitatra fanjakana no nimasoan-dRadama I. Misy voka-dratsiny io politika vaovao io — politika izay mifototra amin'ny fanararaotana ny faritany sy ny mponina hafa eto amin'ny nosy : nihena ny famokarana. Ny tsy fiterahana, ny fahafatesan'ny zaza vokatry ny mosary sy ny tsy fahampian-tsakafo ary ny ady samihafa, ireo no fototra lehibe indrindra nampihena isa ny mponina, ary mbola nitohy hatrany izany tamin'ny fitondram-panjanatany.

RESUME

Les Français ont été étonnés du faible peuplement de Madagascar en 1900 : le premier recensement donnait 2 700 000 habitants pour l'ensemble du pays, dont 800 000 pour l'Imerina. Les sources du XIX^{ème} siècle font état d'estimations très discordantes. Toutefois, il apparaît clairement que la croissance démographique a subi de fortes fluctuations tant dans l'Imerina que dans l'ensemble du pays. Les principales causes dans l'Imerina sont le système du *fanompoana*, la stérilité des femmes à cause de la syphilis, la mortalité infantile due à la malaria et les campagnes militaires.

Cette étude a pour objectif de retracer le plus fidèlement possible les tendances démographiques au siècle dernier Madagascar et notamment dans l'Imerina.