TRANSACTIONS
OF THE
ROYAL SOCIETY OF NEW ZEALAND
GENERAL

VOL. 2 NO. 2 15 FEBRUARY 1967

Malthusian Reflections on the South Pacific

By W. D. BORRIE

New Zealand Science Congress, Auckland, 1965, Chairman's Address to Section F, Social Sciences.

THIS paper will *not* deal with the "European" populations of Oceania. The "European" populations of Australia and New Zealand have their own fascinations for the demographer, economist and sociologist, for their relatively high growth rates over the past 20 years have been the result, first, of the successful assimilation of very large flows of immigrants and, second, of substantial natural increases which reflect changing patterns of both marriage and fertility. The interesting questions to be asked of these populations concern the dynamics of growth[1] rather than any potential limit of resources in the Malthusian sense. Their "problem" is rather how to maximise the considerable investment opportunities open to them, both from their own high *per capita* incomes and from the considerable volume of available foreign capital, than how to reduce population growth rates because of any limit of resources. Few would disagree with the proposition that the population carrying capacities of Australia and New Zealand are many times their existing numbers, and this is indeed the factor which renders so important to them the problems of population pressure in Oceania and South-east Asia.

This paper will attempt to go no further than to consider in very general terms a few of the problems of Malthusian pressure which now exist among the Pacific Island neighbours of Australia and New Zealand, with, first, a brief overview of the perspective against which their current population structures and growth rates should be considered.

The world's population today almost certainly exceeds 3,100 millions[2]. Its birth rate is probably around 34 per 1,000 of population, its death rate around 16 per 1,000, and therefore its natural increase about 18 per 1,000, or, as more usually expressed, 1.8 per cent. This exponential rate is sufficient to double a

1. Such questions have received some attention in Australia. See, for example, Appleyard, R. T., 1964; Borrie, W. D., and Spencer, Geraldine, 1965; Price, C. A., 1963. However, much remains to be done. In New Zealand, excellent beginnings were made in the 1950's (e.g., Jacoby, E. G., 1958) but these have not been followed up. It is perhaps a reflection of the lack of concern about demographic issues in Australia and New Zealand that the majority of applications for scholarships in the Department of Demography at the Australian National University have come from Asia and elsewhere overseas.

2. United Nations, Department of Economic and Social Affairs, 1964.

Published by the Royal Society of New Zealand, c/o Victoria University of Wellington, P.O. Box 196, Wellington.

Trans. roy. Soc. N.Z., Gen., Vol. 2, No. 2, *pp. 19–29.*

population in about 38 years. Should this rate of growth remain constant, the world's population will exceed 6,000 millions by the end of the century. Only a major—and, on the basis of all available evidence, unexpected—fall in growth rates can prevent a doubling of the world's population within the expected life span of the "teenagers" living in New Zealand today.

Historically considered, the unique aspect of the world's demographic situation is not the level of fertility, although the *world's* estimated birth rate of 34 may be lower than it was in past eras because of the rational control of fertility among the world's technically advanced, high income nations. The unique aspect lies rather in the gap between births and deaths, and therefore in the high level of natural increase, which has arisen from man's increasing capacity to prevent wastage through death. New Zealanders and most peoples of European origin take for granted an expectation of life of 70 and more years. We are surprised and shocked if a newly-born infant dies: we expect each infant to be cherubic, good natured and fat, and to survive with nothing worse than a few relatively harmless infectious diseases like measles and chickenpox until adulthood; and generally it does so.

Such expectations are unique in man's history. An expectation of life at birth much above 40 years was seldom if ever attained until about a century ago. Infant mortality rates (that is deaths of infants under one year of age per 1,000 live births) which are below 20 in many of today's advanced countries were still above 100 at the beginning of this century. Even our grandparents must have expected to lose some of their children through the "normal" process of death, and in New Zealand conditions three conceptions today can produce as rapid population growth as five conceptions did only 60 or 70 years ago.

In demographic as well as in political, economic and social terms, the expectations now taken so much for granted among the high income countries of the world are becoming the goals of the developing countries. Colonialism, however much to be deplored in most of its aspects, at least brought enough medical science and elementary health measures to start the process of control of the worst killing diseases of the world and to initiate the fall in the death rate, and consequently the rise in expectation of life. As each new nation has gained its independence, it has taken improved health standards and lower death rates as one of the basic human rights. No government today would dare to seek population control through higher mortality rates.

In some countries the process of declining mortality has been painfully slow, for example in India where the expectation of life at birth only a generation ago was about 30 years and today is estimated to be about 46 years. In others, however, the process of death control has been dramatic, with the expectation of life advancing from below 40 years to almost 60 years, all well within the life span expected by New Zealanders today.

The result of this revolutionary change in patterns of mortality may be summarised as follows:

(1) As the decline has seldom been accompanied by a simultaneous fall in fertility, the rate of natural increase has expanded, from a near balance of births and deaths (which was the predominant pattern of the western world until the 19th century and of much of the Asian world until after World War II), first to rates around 1 per cent a year (which was about the maximum European experience) and then to 2 per cent (as in India today and probably China) and even to more than 3 per cent (which is now common to many south-eastern Asian countries, the Pacific Islands and the New Zealand Maoris).

(2) The decline in mortality has saved the lives particularly of children and men and women still within their reproductive years, so that mortality control has tended to increase the number of children born *and* surviving to each family—a process which again increases the rate of growth.

This process of accelerating growth as a result of contact with or adaptation from medical and sanitary science, improved nutrition and rising economic standards is nowhere better illustrated than among the Maoris. All the available evidence suggests that the Maoris were dying about as fast as new babies were being born and surviving between 1850 and about 1921, when the census recorded 57,000 Maoris. The recorded low birth rate of 20 and a death rate of 16 both reflected under-registration of vital events, but, although both were probably much higher, growth rates were almost certainly below 0.5 per cent a year. From then on, improved health services kept the death rate in check, and in 1945 the gap between birth rates (46 per 1,000) and death rates (16 per 1,000) had widened to give a growth rate of 3 per cent. Since then, the reduction in Maori mortality has been spectacular. By 1956, the expectation of life at birth was around 56 years and is to day around 60 years. Birth rates seem still to be about 46 per 1,000, but death rates have fallen from 16 to about eight per 1,000, giving a rate of growth of almost 3.8 per cent a year, or sufficient to double a population about every 18 years. This is one of the highest rates of growth in the world and, while it is a tribute to New Zealand medical and public health services, it should be emphasised that this growth rate can, and probably will, go even higher.

An official report on Maori health in 1960 revealed that at every age and almost for every cause Maori death rates were still much above those of non-Maoris[3]: 5 per cent of Maoris but less than 2 per cent of Europeans died under the age of one year, and this initial disadvantage was retained throughout life, as the following figures show.

AGE SPECIFIC DEATH RATES. QUINQUENNIAL AVERAGE 1954-58.
(Deaths per 100,000 population of each age group.)

	Under 5 Years	5-14 Years	15-24 Years	25-44 Years	45-64 Years	65 Years and Over
1. Rates:						
Non-Maori	463	38	53	131	743	5436
Maori	1582	136	215	438	2241	8784
2. Number of Times Maori Rate Exceeds European Rate	3.3	3.5	2.5	3.0	2.3	1.4

In short, the relative similarity of the general death rate per 1,000 of total population between eight and nine is simply a function of the marked discrepancy of age of the two component populations: standardised as above, the Maori still had a long way to go, according to the experience of 1954-58. Undoubtedly these differentials are being reduced, but as long as Maori fertility remains at current levels—and there are few signs of reduction yet—Maori growth rates may well come to exceed 4 per cent for some time, or about twice the growth rate of the non-Maori population. If continued, the current rate of growth would increase the Maori population, estimated to be 167,000 at the 1961 census, to 334,000 by 1979 and to about 750,000 by the end of the century.

3. See Rose, R. J., 1960; and Pool, D. I., 1964.

This surge of growth is to be welcomed because it will help greatly to supplement New Zealand's most scarce resource for future development—people. Clearly, there will be many problems, because the process of urbanisation, which has been gathering pace since the 'twenties[4], must go on accelerating, with the Maoris increasing their penetration into all phases of the country's economic and social structure, and with the brunt of the pressures being felt in Auckland. It should be emphasised that 47 per cent of Maoris (compared with 30 per cent of non-Maoris) are still under the age of 15 and therefore have scarcely begun to enter the work force; but when they do enter it the great majority of these young Maoris will have to do so, like most non-Maoris, in non-rural occupations. Adequate investment in education to train the rising generation of Maoris for their increasing participation in all walks of life—skilled trades, administration, management and the professions—is perhaps New Zealand's greatest challenge of the immediate future. The distance yet to be travelled was apparent in the census of 1961 which showed that the proportion of non-Maori men in professional, technical and related work was still four and a-half times that of Maori men; that in management, administration and clerical work the ratio was 7 : 1; and that among sales workers it was 9 : 1.

Yet none of the problems arising from these demographic forces should be insuperable, for the Maoris form part of a nation with one of the highest *per capita* incomes in the world and, therefore, with great investment potential for development. This is the factor which so clearly differentiates the Maori from the rest of the Pacific Islanders.

Demographically, the growth patterns of those Pacific Islands for which anything like adequate statistics are available seem to be very similar to those of the Maoris[5]. They too have experienced rapid declines in mortality but continue to show very high levels of fertility. The 1956 Census Report for Western Samoa gave an estimated growth rate of between 3.0 and 3.5 per cent a year, with a birth rate of 40 or more per 1,000 of population. The report of the 1961 census supports this conclusion. Evidence from other Island groups suggests that such a pattern is probably fairly widespread and that only in American Samoa does there seem to be any suggestion of a decline in fertility.

Projections by Dr Norma McArthur, based upon the assumptions, first, that mortality and fertility as estimated from births and deaths registered around 1956 censuses would continue into the future, thus providing growth rates ranging between 3 per cent and 3½ per cent, and second, that there would be no migration, produced the following populations for the major island groups of the South Pacific[6].

Clearly these populations are going to remain an almost infinitesimal fraction of the world's thousands of millions; but their small numbers and high growth rates have to be considered in relation to the resources available and the political organisation in each island group. To a demographer, these islands present populations, however idyllic they appear to be for the moment, nearer the brink of overpopulation in the Malthusian sense than almost any other groups of people. Vast

---

4. In 1926, 91 per cent of Maoris were living in rural areas, compared with only 67 per cent in 1961.

5. The comments which follow on the Pacific Islands owe much to published and unpublished material supplied by Dr Norma McArthur of the Department of Demography, Australian National University, but I do not hold her in any way responsible for any of the conclusions I draw from that material.

6. McArthur, Norma, 1961; 395. Due to rounding to the nearest hundred, there are minor differences between the above figures and those presented by McArthur.

	Census 1956	Projections 1961	1971
Fiji:			
All components	345,700	410,200	583,900
Fijian component	148,100	171,300	227,700
Indian component	169,400	206,800	314,400
Western Samoa	97,400	113,900	157,800
American Samoa	20,100	23,700	33,100
Tonga	56,800	66,700	91,900
Cook Islands	16,700	19,400	26,800
French Polynesia	75,100	88,700	122,000
TOTAL	611,800	722,600	1,015,500

aggregates of people under a single political system, such as India or mainland China, have generally reserves that can be drawn upon when famine or disease strike. For one thing, such catastrophes tend to strike in only parts of these sub-continents. Also, the smaller countries of south-eastern Asia have a variety of resources and avenues of international trade which leave them with considerable scope for future growth and development.

Compared with these, the Pacific Islands have few reserves. Western Samoa has probably the greatest reserves of land yet to be brought into cultivation. Fiji has still some potential in sugar production, but land development projects will probably continue to be dogged by problems of land tenure and relations between Indians and Fijians[7]. Land development schemes can, however, only be short-run solutions so long as growth rates continue anywhere near recent levels. The same is true of tourism. Somehow industrial diversification must accompany political independence, and it would seem that in the absence of any complementarity among the Island economies this can only be achieved in the longer run by their association with more mature and diverse economies, as in Australia or New Zealand.

The nature of the problems of employment and economic growth that have to be faced can be seen from a brief examination of the age structure of the populations. As in the case of the Maoris, almost half the populations of these islands is under the age of 15 years. This guarantees that, without emigration, there will be continued expansion of those of working age for the *next* 15 years. The following figures show the number of males aged 15-19 enumerated in 1956 and the increases to be expected by 1971 on the basis of the assumptions in Dr McArthur's projections.

RECORDED AND PROJECTED MALE POPULATION.
Aged 15-59 Years.

	Census 1956	Expected Increase 1956 - 1971	Projected Nos. 1971
Fiji:	87,300	60,700	148,000
Fijian	39,100	21,800	60,900
Indian	39,900	35,400	75,300
Western Samoa	23,400	18,700	42,100
Tonga	14,700	9,100	23,800
French Polynesia	20,400	10,400	30,800

7. These problems of economic development in Fiji are succinctly summarised by Kamikamica, J. N., 1962.

In every case, the annual increase in those males of working age exceeds 3 per cent. With the Indians in Fiji, it exceeds 4 per cent. Economic growth rates must, therefore, be kept at commensurate levels if living standards are not to decline. The attainment of such a goal will not be easy, as may be illustrated from the cases of Fiji and Western Samoa.

The most difficult case seems clearly to be Fiji, partly because of the differential growth rates and economic functions of Fijians and Indians. Indian males aged 15-59 are increasing at the rate of approximately 4.5 per cent compared with a Fijian rate of just over 3 per cent. Should this difference be sustained, the ratio of Indians to Fijians, which was 114 : 100 in 1956, will increase to 138 : 100 by 1971. Now the 1956 census revealed that 17,000 of all economically active Indian males (43.6 per cent of the Indian male population aged 15-59) were engaged in the cultivation of sugar cane. The area under cane has increased considerably in recent years, particularly since the lifting of the quota on cane growers with the suspension of the International Sugar Agreement in 1962, but the further land suitable for cane growing is not limitless. Nor is sugar a labour-intensive industry. Consequently sugar cannot solve the labour-surplus problem. McArthur has suggested that the future employment of 20,000 Indians may be the upper limit, which would mean that by 1971 some 55,000 Indian males aged 15-59 might have to be provided with other forms of livelihood. Other forms of rural occupations are likely to be closed to them, for Fijians own the land, and it is unlikely that even the extension of subsistence farming (which was already the form of livelihood of 90 per cent of the Fijian males who were classified in 1956 as engaged in agriculture) can cope with the expected increase of the Fijian population. A drift of Fijians from agriculture is already apparent, and this is likely to continue. Thus, to the 55,000 Indians who may seek non-agricultural employment by 1971 have to be added probably 20,000 or 30,000 Fijians. Allowing for some improvement in productivity in rural industries, the total numbers of males aged 15-59 to be employed in Fiji by 1971 in non-rural occupations may well exceed 80,000, which is clearly going to be a difficult task in a country with a chronic tendency towards an unfavourable balance of trade and limited local capital for investment.

Demographers, like their spiritual father Malthus, may seem to wallow in gloom by over-emphasising the human factor and under-emphasising geographical and economic aspects. Some Economic Geographers working in Fiji seem at least to be a little more cheerful, arguing that with only 11 per cent of the land area cultivated out of at least 30 per cent that is utilisable *now,* with a sizable total land area of 7,040 square miles, with considerable known resources of mineral ores, and with a growing attraction for tourists, the prospects for both increasing employment and economic diversification are reasonably good for a considerable time ahead[8]. There seems little doubt that Fiji has considerable unused resources. Gold is Fiji's third largest export. Minor amounts of silver, iron ore, manganese ore and copper ore are also produced. Bauxite appears to be plentiful enough to attract the interest of Canadian and Japanese companies. And, in the words of an official pamphlet, " it is believed that underdeveloped resources await systematic exploration and plans

8. See particularly Watters, R. F., 1965. This article is, however, more cautious than some of the views expressed at the Symposium of the New Zealand Science Congress at which Fiji's economic future was discussed. In his article, indeed, Dr Watters virtually admits that current trends in agricultural and industrial output cannot cope with the population increase and he concludes by looking for the long-term solution in fertility decline. There are hopeful but slight signs in this regard; but any relief this may bring to the increase in the labour force must of course be some 15 years away.

are afoot for a mineral development programme in which it is hoped that overseas mining exploration groups will become interested "[9]. The demographer is inclined, however, to add the footnote to these optimistic expressions that neither agriculture (especially if improved productivity is the aim) nor mining associated with mineral ores can cope with a labour force increase of over 3 per cent a year. Furthermore, the establishment of labour intensive industry in Fiji will require extensive capital investment from overseas, which must in time be offset by rising exports of commodities, such as sugar and metals, which are highly competitive.

By contrast, the situation in Western Samoa seems a little more favourable. The increase in males aged 15-59 between 1956 and 1971 implied in the projections given above is 18,700, or approximately 80 per cent. Traditional village farming is still the main male occupation. In 1956, 70 per cent of males who were economically active were so engaged, compared with only 8 per cent in commerical farming and 10 per cent in manufacturing construction and commerce. In 1959, of a total land area of 700,900 acres, 127,500 acres were in cultivation and a further 471,500 acres were under forest, of which 22,000 acres were regarded as suitable for cultivation under existing methods[10]. The development of this land will, however, require considerable redistribution of population which would tend to disrupt the traditional forms of social and economic organisation and probably increase the emphasis upon commercial agriculture. As in Fiji, such a development would increase the surplus requiring employment in non-agricultural occupations—a surplus likely to be further augmented by the elimination of under-employment associated with the low productivity of traditional farming methods. There is the additional problem that the extension of rural production will continue to depend heavily upon world prices for copra and cocoa.

Generally, the picture arising from an analysis of demographic and economic trends in Samoa is one of a probable increase in the proportion of the work force which is surplus to the requirements of agriculture and a concomitant need for increased investment in non-rural enterprise to create new avenues of employment. Capital for such purposes must compete with the heavy demands for social capital, such as for schools and health services, which themselves are substantially determined by the structure and growth patterns of the population. Consequently, capital for economic development may have to come increasingly from non-Samoan sources, and this is the point at which the Samoans, like the Fijians, begin to face a much more difficult situation than the Maoris. The same types of problems are common to almost all the other Pacific islands.

There is, however, one ray of hope in this otherwise rather dismal picture, and this arises out of the very smallness of the populations of these islands. Their growth rates are very high, but in absolute numbers their annual increments are still small, and the emigration of a few thousand of these islanders each year could bring the growth of their work forces (which without immigration would tend to be growing in some areas at 4 per cent a year) down to levels which could be coped with internally. Indeed, such emigration is already occurring[11], which may itself be taken as evidence that the island people are aware that they are approaching the limit of their available resources.

---

9. *Fiji Information*, May, 1964.

10. Jupp, Kathleen, 1961.

11. McArthur, Norma, 1964, 336-9.

Recent censuses have been taken in American Samoa (1960), Western Samoa (1961), the Cook Islands (1961) and French Polynesia (1962). The census of American Samoa indicates that the work force there actually decreased between 1950 and 1960 and that the total population remained almost stationary instead of increasing as in the projection given earlier in this paper. The emigration appears to have been to the United States, most of it probably to Hawaii. It also appears that some Western Samoans have moved into American Samoa and joined the overseas exodus to the United States of America, while others have gone direct from Western Samoa to New Zealand. McArthur[12] estimates that the numbers expected to survive for five years after 1956 in Western Samoa exceeded the numbers actually recorded in the 1961 census by some 4,000. A similar emigration to New Zealand occurred from the Cook Islands, in which the number of adult males aged 15-59 remained almost stationary between 1956 and 1961.

It seems, therefore, that outlets which already exist may continue to check the increase in the labour force of some of the smaller island groups. The removal each year of 180 Cook Island males between the ages of 15 and 59 would go far towards stabilising its labour force. About 300 such emigrants a year would do the same job in American Samoa. A similar objective could be attained for the Tongans by the emigration of 600 males a year. Western Samoa would require an annual loss of about 1,400. These are small numbers, but they leave out of account Fiji, which has over half the population of the territories under consideration. An adult male emigration of some 4,000 a year would be required to stablise the male work force in Fiji, and over half of these would have to be Indians, a fact which would raise some difficult issues in relation to the current immigration policies of some of the possible host countries.

Altogether, the annual emigration of some 7,000 males aged 15-59 would seem likely to check future growth of the work forces of Island populations. This is probably a maximum figure because some of these can undoubtedly still be absorbed in their own territories. But more than countering this would be the very reasonable wish of adult male emigrants to take their immediate families with them, which would be likely to double the numbers of emigrants. Thus any plan to keep the work forces of these territories reasonably stable would probably mean the removal each year of some 12,000 to 14,000 persons. I shall not attempt here to lay down administrative plans by which such emigration could be carried out, and by which the emigrants could be trained for successful absorption into the economic and cultural systems of host countries.

The only way of avoiding the need for such emigration in the longer run is the widespread and rapid application of birth control. Over most of the area women still seem to be bearing an average of five and six children by the end of their reproductive lives. There are, however, some straws suggesting a slight change in the wind. As already indicated, there are some signs that the American Samoans are marrying later and having fewer children. I understand that birth control clinics, with official approval, are being established in Western Samoa. In Fiji, too, modern contraceptive practices are becoming increasingly known. The Director of Health in Fiji has reported that visits to the 23 Family Planning Clinics increased from 2,732 in 1963 to 17,079 in 1964, when 4,129 were first visits. Estimated sales of contraceptives in Fiji, including oral pills, rose in 1964 from 464 in January to 1,250 in December; 776 women were then known to be fitted with intrauterine devices and 2,300 women were sterilised in 1964; by December 1964, there were

---

12. McArthur, Norma, 1964, 337.

an estimated 6,400 women "protected" from unwanted pregnancy[13]. In Letoka and Suva trials are being run by the International Planned Parenthood Federation with Government approval. While these figures and facts may well suggest the dawn of a new era, they still refer to a very small minority, and there seems little doubt that the population growth rate in Fiji is still over 3 per cent. Official estimates of December 1964 give the following rates per 1,000 for that year: births 37.22; deaths 5.96; with, therefore, a natural increase of 31.26. The death rate seems suspiciously low, and, if so, the birth rate is also probably underestimated; but if both rates are low in the same degree, the growth rate may be near the mark. A real test will have to await the 1966 census.

Anyone who has followed the revolutionary change in world opinion over the last five years in regard to birth control, and particularly the very rational approach of most of the non-European world, cannot help being optimistic about the prospects of fertility decline. But in the areas considered in this paper, social and cultural organisation still favours the large family, and no island government seems yet prepared to advocate really drastic measures to reduce fertility, as, for example, the Indian Government has done. Nor do the Maoris, despite their close association with a European population well versed in the arts of birth control, show any signs of providing an example for their island cousins. Furthermore, birth control could not affect the short-run problem, which arises from the fact that almost 50 per cent of these populations is under the age of 15 years and has to be given productive employment or sustenance.

Thus, in relation to the available resources of their territories, the demographer is driven to the conclusion that the Pacific Islanders, with the exception of the Maori, will be forced to accept some measure of population control within the next 30 or 40 years. Such control could take many forms, just as it has done and is still doing among other populations—for example, abortion as in Japan or in Eastern Europe in the last decade (when abortions tended to exceed the numbers of registered births), restraint from marriage, or the use of birth control methods which are now common among New Zealand and other European societies. The sensible course would seem to be to encourage a combination of a modest level of emigration and a vigorous action programme in the field of family planning. But, as already emphasised, emigration would be the most efficient course in the short run, as it could immediately control the growth of the work force. If emigration is sought by the Island governments as a solution, Australia and New Zealand will be forced, as Pacific countries themselves, to consider their special responsibilities in the matter.

The one group considered so far in this paper for whom population control does not appear to be a necessity is the Maori; but a continuation of Maori growth rates at rates between 3.5 and 4 per cent a year presents New Zealand with perhaps its greatest and most exciting challenge since the signing of the Treaty of Waitangi. If not the greatest it is certainly the most urgent challenge. The evidence for this is the 48,000 Maoris in the country's 18 urban areas in 1961—an increase of 19,000 since 1956[14]—and the 101,000 young Maoris who make up 10 per cent of the nation's population under the age of 21 years.

---

13. From a communication of 17 March 1965, from R. F. Watters.

14. All the boroughs of New Zealand, including cities, carried 55,700 Maoris in 1961, an increase of 23,300 since only 1956.

Fiji, Samoa and the Maoris are only examples of problems arising from high natural growth rates, which must remain the major concern of the "European" countries in Oceania. To these must be added the Aborigines in Australia and the problems of population growth and economic development in New Guinea.

The demographic history of the Aborigine in Australia resembles in some respects that of the Maori in New Zealand—a period of decline with a prognosis of extinction, followed by recent demographic revival. Precise figures about the past will never be possible; but the main features of the present and the prospects of the future are becoming much clearer. A major study[15] based upon the Aborigines of the Northern Territory and covering a population of some 17,200, gives a picture of birth rates which may well exceed 35 per 1,000, a life expectation which may be close to or even in excess of 50 years, and a growth rate around 2.0 per cent. Whether these demographic patterns are true of Aborigines elsewhere remains to be tested, but there is no reason to believe that this is not the case. It is also clear from the movement of Aborigines, not only into fringe settlements in country towns, but also into the low income inner suburbs of the major cities, that growth is exceeding economic opportunity in rural and tribal areas, and while the problems of employment and assimilation thus raised are quantitatively smaller than those faced in Auckland with the Maoris, they are qualitatively and sociologically much the same.

As for Australian New Guinea, this remains essentially unchartered, demographically speaking. A recent estimate is that the indigenous population increased from 1.832 millions in 1959 to 2.032 millions in 1963, a growth rate of 2.2 per cent a year, and that with falling mortality resulting from the planned eradication of malaria and the extension of infant and child welfare services this rate might grow to 3.75 per cent in 1976 "with a gradual decline to a stable 2.7 per cent about the turn of the century"[16]. If the assumed trend occurs, the total population would be 2.688 millions in 1973, with an estimated increase in "high level" manpower from the 6,197 employed in 1963 to 19,902 in 1973, and with the 148,400 children in primary and technical schools increasing over the same period by 325,000 assuming that participation rates of the relevant age groups were only raised from 30 to 50 per cent[17].

In the absence of reliable demographic and social statistics[18], these figures must remain speculative, but regional surveys which have found rates ranging from 38 to 53 births per 1,000 of population[19] at least strengthen the view that the overall growth rate may now exceed 2 per cent and that the expansion of growth rates to 3 per cent or more is quite likely if the proposed health measures can be carried through.

Whether the New Guinea situation be viewed from the angle of education, labour force, expanding rural production, industrial diversification of the economy, or urbanisation, the problems are similar in many respects to those of the smaller islands of Oceania. But unlike those small islands, New Guinea is a very large

---

15. Jones, F. L., 1963.

16. Currie, Sir George, 1954, 18.

17. *Ibid.*, pages 28 and 31.

18. A breakthrough is hoped for in the proposed census to be taken in June, 1966, and in anticipation of this a Research Fellow has been appointed in the Department of Demography of the Australian National University to work on New Guinea.

19. McArthur, Norma, 1966.

country whose resources can amply provide for many decades to come; and it is indeed this potential, together with its already substantial population and with the international pressures to speed up both economic development (e.g., the recent report of the World Bank) and the move to political independence (in the United Nations Trusteeship Council) which make the area so significant to Australia.

REFERENCES

APPLEYARD, R. T., 1964. *British Emigration to Australia.* Australian National University Press, Canberra.

BORRIE, W. D., and SPENCER, GERALDINE, 1965. *Australia's Population Structure and Growth.* Melbourne, Committee for Economic Development of Australia.

CURRIE, SIR GEORGE, 1964. *Report* of the Commission on Higher Education in New Guinea, Canberra.

(Fiji) Public Relations Office, May 1964. *Fiji Information.* Government Press, Suva.

JACOBY, E. G., 1958. "A Fertility Analysis of New Zealand Marriage Cohorts". *Population Studies,* XII: 18–39.

JONES, F. LANCASTER, 1963. *A Demographic Survey of the Aboriginal Population of the Northern Territory, with special reference to Bathurst Island Mission.* Australian Institute of Aboriginal Studies Occasional Paper No. 1, Canberra.

JUPP, KATHLEEN, 1961. "Population Expansion in Western Samoa". Paper presented to the *Tenth Pacific Science Congress,* Honolulu, August, 1961.

KAMIKAMICA, J. N., 1962. "Some Problems of Economic Development in Fiji". *Australia's Neighbours,* 3rd Series, No. 125, Australian Institute of International Affairs.

MCARTHUR, NORMA, 1961. "Population and Social Change: the Prospect for Polynesia". *Journal of the Polynesian Society,* 70: 393–400.

——— 1964. "Contemporary Polynesian Emigration from Samoa and the Cook Islands". *Journal of the Polynesian Society,* 73: 336–9.

——— 1966. "The Demographic Situation". *New Guinea on the Threshold. Aspects of Social, Political and Economic Development, ed.* FISK, E. K.: 103–114. Australian National University Press, Canberra.

POOL, D. I., 1965. *The Maori Population of New Zealand.* Unpublished Ph.D. thesis, Department of Demography, Australian National University.

PRICE, CHARLES A., 1963. *Southern Europeans in Australia.* Oxford University Press, Melbourne.

ROSE, R. J., 1960. *Maori-European Standards of Health.* Special Report No. 1, Medical Statistics Branch, Department of Health, Wellington, New Zealand.

UNITED NATIONS, Department of Economic and Social Affairs, 1964. *Provisional Report on World Population Prospects, as Assessed in 1963.* New York.

WATTERS, R. F., 1965. "The Development of Agricultural Enterprise in Fiji". *Journal of the Polynesian Society,* 74: 490–502.

PROFESSOR W. D. BORRIE,
Department of Demography,
Research School of Social Sciences,
The Australian National University,
P.O. Box 4, Canberra,
A.C.T., Australia.