

condition and its aim: the condition, an audience of weary working-men, with little time to give, and who reject all instruction which is not easily grasped and enlivened by amusing spectacles: the aim, to communicate entertaining knowledge in a utilitarian spirit, to open a glimpse of intellectual enjoyment such as may at the same time bear practically on the comfort and happiness of daily life. In the experience necessary for such a taste Mr. Twining probably stands alone, and in reviewing the forms his efforts have taken we may fairly bow to the judgment which shaped them.

But the main objection to this curious and novel system will occur to everyone. Is it possible that any man uttering the knowledge and the thoughts of others on a subject with which he is quite unfamiliar can import into his task the enthusiasm necessary to kindle and inform an audience? A purchased sermon read from a pulpit never yet edified anyone; will it be more inspiring to receive scientific truth from the lips of a man who articulates by rote instead of teaching from that lofty standpoint of superior knowledge which converts hearers into disciples? Mr. Twining speaks gratefully of the admirable readers he has been fortunate enough to find in London. They were probably not mere elocutionists, but possessed of dramatic minds, and able to generate at will enthusiasm in a noble though unfamiliar subject, and their like will not be met with every day. Mr. Twining shows his uneasiness on this point by his strong injunctions to careful practice on the part both of reader and demonstrator, and whoever attempts to carry out the scheme will have to lay special stress on this. Nor can we omit to mention the subject of expense. The apparatus necessary only for the six lectures before us costs, exclusive of plans and diagrams, from 44*l.* to 48*l.* 10*s.* A club, society, or institute, including dexterous workmen amongst its members, could probably obtain all that is wanted at half this price, but in many places the difficulty of meeting the expense might turn the scale against the introduction of the lectures.

These difficulties have, no doubt, been well considered by the author of the scheme, and are thought by him to be not insurmountable. We most sincerely hope that it may be found so. His enterprise will be watched with no slight interest by all who feel that the spread of scientific knowledge among the operative classes is a pressing national necessity, and that one who devotes to it, as Mr. Twining has done, experience, thought, and toil, deserves the gratitude and the help of his countrymen.

W. T.

OUR BOOK SHELF

Life with the Hamran Arabs. An account of a Sporting Tour of some Officers of the Guards in the Soudan during the winter of 1874-5. By Arthur R. Myers, Surgeon, Coldstream Guards. With Photographs. (London: Smith, Elder, and Co., 1876.)

The sporting tour of which Mr. Myers gives the narrative in this volume was made at the same time as that described by the Earl of Mayo in the work which we recently noticed. Indeed the two parties started together, and their work lay in regions not far distant from each other. Mr. Myers and his party were much more fortunate than the Earl's party. They did not meet with so many hindrances, and were much more fortunate in the number

and variety of animals that came in the way of their rifles. The region to which Mr. Myers's work refers is on the borders of Abyssinia and Egypt, and has been already made familiar to English readers by Sir Samuel Baker in his "Nile Tributaries." Mr. Myers simply pretends to tell of his sporting adventures, and therefore we have no reason to complain if he adds little to our knowledge of the country of the Hamran Arabs. He writes in an unpretentious style, and his work will be found interesting by the general reader, and specially so by those who love sport. It contains photographs of some of the trophies brought home, arranged by Ward and Co.; they give a good idea of the variety of animal life to be met with in this part of the Soudan.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Decrease of the Polynesians¹

I BELIEVE there are some errors popularly received respecting the rapidity with which the inhabitants of Polynesia, as a whole, are disappearing before an advancing civilisation. I wish to make a few statements on this subject in connection with a review of Miss Bird's book on "The Hawaiian Archipelago," which appeared in NATURE, vol. xi. p. 322.

The primary source of error is the excessively high estimates as to the population of different islands in Polynesia made by early visitors and residents. In most of the islands the people live chiefly, or entirely on the coasts; whereas, in the estimates, allowance is made for a proportionate population in the interior.

Another error, I believe, is the supposition that the decrease of the people is entirely (or almost entirely) owing to their contact with foreigners. From personal knowledge of Polynesia I feel convinced that the people were rapidly decreasing before their intercourse with civilised races commenced.

It is also a mistake to suppose that decrease is by any means universal at the present time. While in some islands the decrease of the natives has been accelerated since they have come into contact with modern civilisation and its attendant evils, in other islands the previous decrease has been greatly retarded, or even changed into an increase, by the beneficial influences of a Christian civilisation. This change has been brought about by such causes as the following:—The partial or complete cessation of wars; the discontinuance of human sacrifices (in some islands the cessation of cannibalism may be added); the cessation of infanticide; the greater respect paid to women, which leads to their release from some of the hard work which, in heathen times (in some portions of the Pacific) fell almost entirely to their share, and the consequent increase of living and healthy progeny; the increased care taken of infants and aged people, and the general progress of industry resulting from more settled habits, which leads to a more regular supply of food.

As an example, in proof of the correctness of my statements I will cite the Samoan Islands. In the "Encyclopædia Britannica" (eighth edition) we read:—"The population of Samoa

¹ I wrote this paper some months ago, intending to send it for publication in NATURE, but I afterwards determined on withholding it for the present, hoping at some future time to discuss in a more systematic and thorough manner this subject, together with some other questions bearing on the ethnology and anthropology of Polynesia. I am now, however, induced, by the reference in Prof. Rolleston's address before the British Association at Bristol, to publish it as it was first written, hoping it may prove a small contribution towards a correct understanding of this subject.

I take this opportunity to thank Dr. Rolleston for putting in its true light the relation which the work of missionaries bears to the decrease of Aboriginal populations. It is high time that the ignorance, prejudice, and narrowness manifested by many literary and scientific men gave place to a broad, common-sense, and enlightened view of the matter. Missionaries are sometimes represented as if they were the actual destroyers of the weaker races; a view somewhat smartly set forth in one of Mr. Bernard Quaritch's scientific book catalogues (No. 294, Jan. 1875) in the following words:—"The missionary is a grand and striking figure in the history of the world. Robbed in black, and bearing the *Word of Life*, he moves among the weaker races of mankind; around his path they sicken and perish, and countless nations of men are swept away." In Polynesia, the agents of the London Missionary Society, at least, usually dress in white, and not in black, and I imagine most sensible missionaries who live in the tropics, do as we do in this respect. But whether we wear the ominous black, or adopt the more hopeful (or comfortable) white, I fancy Mr. Quaritch is guilty of what the logicians call an *ignoratio elenchii*. S. J. W.

Samoa, Dec. 30, 1875

has been variously estimated from as many as 160,000 to as few as 38,000. The Rev. J. Williams estimated them at the former number in 1830, and Capt. Erskine, in 1854, at the latter; but by the missionaries (*Samoa Reporter*, 1845), the population was reckoned at from 50,000 to 60,000. At present the Samoan nation does not probably exceed 40,000 souls" (vol. xviii. p. 278. See also vol. xvi. p. 88).

In 1853 the first census of the population of these islands was taken, and it was then found that the natives numbered 33,901. Thus, according to the Rev. J. Williams's estimate, there was a decrease of 126,099 in twenty-three years, or 5,482 per annum! According to the lowest estimate of the missionaries in 1845, there was a decrease of 16,099 in eight years, or 2,012 per annum! Capt. Erskine's more moderate estimate was 4,099 above the actual number ascertained by census the year before he made it.

In 1863 a second census of the population was taken, and the natives then numbered 35,097, showing an increase of 1,196 in ten years, or 119 $\frac{1}{5}$ per annum.

In 1874 another general census of Samoa was taken, and the entire native population was found to be 34,265, showing a decrease of 832 in the eleven years since 1863, but still giving an increase, in the twenty-one years since 1853, of 364: the decrease during the shorter period averaging 75 $\frac{1}{4}$ per annum, while the increase during the longer period averages 17 $\frac{1}{4}$ per annum. This difference is easily accounted for. During the eleven years which intervened between the second census and that recently taken, there was a civil war in the principal islands which lasted more than four years, in consequence of which the usual death-rate was largely increased. This was not merely owing to the actual number of people killed in fighting, but chiefly to privation and suffering in those districts where the fighting took place. The census shows a decrease on the different islands in proportion to the amount of damage done, and the consequent privations suffered by the people. Thus Upolu, which was the principal seat of the war, suffered very severely; and here there was a decrease of 988 in a population of 17,556, or more than 5 per cent. Savaii, which suffered comparatively little, shows a decrease of 140 in a population of 12,670—slightly over 1 per cent. On the other hand, the island of Tutuila, which was not involved in the war, shows an increase of 296, or more than 8 per cent. in the eleven years: the population in 1863 being 3,450, while in 1874 it amounted to 3,746.

In one part of Upolu, where a register of births and deaths was kept for several years previous to the above-mentioned war, there was an annual excess in the number of births over the deaths, averaging from 1 to 2 per cent. I believe the decrease in the aggregate population during the eleven years is entirely owing to the war.

The population of the small island of Niue (Savage Island) was counted in 1859 and found to number 4,300. It was counted again in 1864, and found to number 5,010, showing an increase of 710 in five years, or more than 3 per cent. per annum. In 1868 the population was again numbered, and found to amount to 5,060, showing an increase of fifty only in four years. But at the latter date many of the natives were away as voluntary immigrant labourers in other islands—seventy-five being in Samoa—and many others were sailors on board vessels: hence that does not represent the actual increase. I know many other islands in Polynesia where there is a steady increase in the population year by year, since the abolition of paganism.

But notwithstanding these facts, which give some hope for the Polynesians, I fear the balance is against them in the aggregate, and that the general tendency is towards a more or less rapid decrease which—unless some measures for their conservation are found—will greatly diminish, if not destroy them. The causes which produce this tendency are, *first*, those epidemic diseases which commit such fearful havoc in localities to which they are newly introduced. Some of them, such as influenza and measles, are comparatively harmless in countries where they have long been prevalent. But they are terribly fatal in a new country, as has lately been seen in Fiji. This excessive mortality is not, I believe, owing to the want of stamina in the constitutions of the natives; but may be accounted for by their mode of life, and by the fact that the inhabitants of entire villages are stricken together, leaving none in health to procure food for, and attend to, the sick.

But fearful as the effects of these epidemic diseases are, they do not recur, and, in my opinion, there are other causes which, in the end, prove themselves far more destructive. These are constantly working, and are every day working with augmented

power; and these the Polynesians owe entirely to their intercourse with foreigners. They are *ardent spirits* and *syphilis*. In the case of the Hawaiian Islands, *leprosy* may be added; for in that archipelago these three scourges are working with fearful effect, and they bid fair to sweep off the greater part of the natives. But those islands must not be taken as fairly representative of the state of Polynesia as a whole. In many islands the drinking of foreign spirits is almost unknown, and in many more syphilis is rarely if ever met with.

The question may be asked, What possible remedies can be suggested which may, by moderating, or removing, the causes of decrease, help in the conservation of the Polynesians? The only possible remedies which at present occur to me are: (1) Strict quarantine regulations wherever there is a government by which they can be enforced. (2) A heavy duty (which would be, practically, prohibitory) on the deleterious kinds of spirits commonly imported into the islands and vended to the natives.

The introduction of measles into Fiji since the establishment of British rule there does not speak very strongly in favour of the efficacy of the first remedy. But there surely must have been some serious oversight or neglect on the part of medical officers, when infected persons were permitted to land on those islands from a British man-of-war, and such oversight or neglect ought not to be repeated elsewhere.

It would be a blessing if some measures could be taken to protect the Polynesians against one of their worst enemies—ardent spirits. It is notorious that an immense quantity of a noxious kind of spirit is constantly imported into some of the islands and sold to the natives. The taste for this deleterious drink is increasing, and likely still to increase. If low traders will continue to vend such a vile compound, without regard to the amount of human misery, or even loss of life, which may result therefrom, it appears to me that all respectable merchants who do business in Polynesia should set themselves against it and keep their hands clean from the traffic.

Samoa, South Pacific

S. J. WHITMEE

Wind Driftage

IN the interesting narrative of the cruise of the *Challenger* that appeared in NATURE (vol. xiv. p. 93), the wind-formed rocks and drift of the Bermudas are referred to. This probably will call attention to the much-neglected subject of wind driftage; but I sincerely trust Prof. Thomson and his Colleague will discard such an ill-advised name as "sand-glaciers" for the inundations of "Æolian" or "blowing sands." The term glacier belongs to ice; beside, these sand-streams do not act like glaciers, their advance being more similar to that of a lava flow.

Somewhat similar sands occur in Australia, and were described years ago under the name of "Æolian drift," by an officer of the Royal Engineers (whose name I now forget), those in the vicinity of Melbourne Bay being remarkable for containing regular strata of empty bottles. In Kutch there are extensive wind-formed rocks, in some, such as Meeta and Kara, the cement being principally salt. On the coast of Ireland travelling sands can be studied on a small scale. At Bundoran, the late Lord Palmerston stopped the Æolian drift from travelling by planting it with the Austrian pine; on the west coast in places considerable encroachments take place, one of the most conspicuous now in progress occurring to the east of Broad Haven, co. Mayo. Here, a few years ago, the "bent," or grass on a large accumulation of sand was cut by the natives, and the sand began to travel eastward. Now it has destroyed several hundred acres of tillage land and driven the inhabitants before it over the brow of the hill into a boggy valley.

G. HENRY KINAHAN

Wexford, June 10

Freezing Phenomenon

PROBABLY the following statement may be of use, probably also it is nothing new, but in the faint hope of its being a mite of value, I send it.

In a wash-hand basin, placed in an out-house where fine dust fell on the surface of the water, I noticed this last winter, that there was a thin sheet of ice atop, and that the dust had fallen to the bottom of the basin, and there was arranged in precisely the same patterns as were to be seen in the hoar-frost on the panes of glass of some neighbouring hot-beds.

This would seem to show that, in freezing, water goes through a series of fantastic movements.

Could such motions be at all comparable with the changes that the particles of iron go through from cold, and occasionally