

wide currency in Australia. The former I connect with early Papuan influence, the latter more especially with Malay. He objects on the ground that connectives of "mama" are more common in the Malay districts of the Eastern Archipelago than "bapa." But in Australia the word "mama" occurs only in the extreme S.W. and S.E., among the purest modern representatives of the earliest occupants of Australia, thus affording ground for the conclusion that the term "mama" preceded the term "bapa." The wide prevalence of "bapa" forms in other countries I myself refer to on page 44; but the question is, What race was specially influential in giving such forms currency in Australia? As against my position it is not sufficient for Mr. Ray to say that "mama" variants are of more frequent occurrence in Malay centres than "bapa" variants, he will have to prove that the words of "mama" type are not adopted words in Malay, were not earlier in use in the East Indian Archipelago than the other type of words, and are not more markedly Papuan than these.

Mr. Ray complains that individual words in the languages quoted "are not always accurately given or properly understood." This may be; but like himself I am dependent upon my authorities. When further on he suggests that I might have attempted uniformity of spelling in the foreign words, he is like the "children sitting in the market-place." A desire to be free from suspicion of tampering with my borrowed materials kept me from applying to them a uniform system of spelling, and evidently my caution was not unnecessary.

Mr. Ray's harshness is all the more indefensible since he himself falls demonstrably into error on the very point upon which he proposes to correct me. As proof of my mistaking the form and meaning of words, he cites the New Guinea numerals (pp. 165, 169). He says they are explainable compounds. He does not, however, attempt to explain them. But even if they are, this fact alone does not prove that they could not be transmitted to Australia. One feature about Australian numerals is clearly shown in my tables, viz. that they occur geographically in lines that converge on Cape York Peninsula. Some of them are most certainly identical with forms in use on Saibai Island on the New Guinea coast, e.g. "woorba," with variants traceable along the Queensland coast from a point about 1000 miles S.E. of Cape York, and represented in the form "warapune" Prince of Wales Island, "woorapoo" at Warrior Island, and in "urapon" at Saibai. One numeral, "luadi" (two), used by the Kalkadoon tribe, whose territory is about 150 miles south of the Gulf of Carpentaria and some 600 miles S.W. of Cape York, is a Melanesian numeral. It did not fly that distance through the air. And there is just as little doubt about the identity of at least several of the other Australian numerals with the New Guinea forms to which I have related them. My table of numerals was not formed rashly. It will be worth Mr. Ray's while to examine and test it carefully. The convergence of numerals upon Cape York Peninsula is only one striking illustration of what occurs in the case of other words, and words thus traced to the very coast must have come from New Guinea and adjacent islands.

As another example of my misunderstanding words, Mr. Ray refers to my "ori kaiza," pp. 66-7. He says: "Ori kaiza" is mongrel, "ori" (bird) is Toaripi, Papuan Gulf, and "kaiza" (big thing) is Saibai, West Torres Straits. This is, for himself, a most unfortunate example. Although he speaks so authoritatively, he is utterly at fault. Sir W. MacGregor's reports give "uroi" (bird) as a Saibai word; and even Mr. Ray himself, in his paper already quoted from, gives "urui" as Saibai for 'bird,' a fact he appears to have forgotten. Besides, in the "Voyage of the *Rattlesnake*," containing vocabularies obtained in 1849 from a white woman who had been among the natives for four and a half years, McGillivray gives "wuroi" as a Cape York word, and "ure" as a Kowrarega word, both meaning bird. Mr. Ray's assertion, therefore, that "ori kaiza" is mongrel, is contrary to fact, and my tracing of this compound word across Australia from S.W. to N.E., and to the New Guinea coast, is not in the least invalidated by Mr. Ray's groundless and inconsistent statement that the word is mongrel.

Mr. Ray characterises my comparison of Australian words with Malay and New Hebridean as "absurd and misleading." This may be so to one with his pre-conceptions, but certainly not from the point of view which I have taken of the relation subsisting between the races whose words are compared. If the Tasmanians were the original occupants, both of Australia and the greater part of Melanesia, which is my hypothesis, it

is not unreasonable to suppose that certain radicals would be common to Tasmanians, Australians and Melanesians proper. And further, one of the most competent authorities on the Oceanic languages, the Rev. Dr. MacDonald, of Efate, is of opinion that Malay, Melanesian and Polynesian are sister languages derived originally from one mother tongue. If he be right, there would be no absurdity in affirming analogies between Malay and New Hebridean words. But I have included the Malay with a note almost like an apology. I only cite eight Malay words, and the only conclusions I draw concerning the Malay in this connection is "The terms for father, skin, are the same in Malay, Australian and New Hebridean" (page 156).

I would have liked to have shown that the Melanesians proper have had much more influence upon the Australians than Mr. Ray seems to have any conception of, but I have already taken up so much space that I must content myself with saying that this proposition can be successfully maintained, and with your indulgence I hope in a future letter to make good my words. In conclusion, I would just say that I welcome fair and sound criticism based on accurate knowledge for its influence in promoting truth, but mere fault-finding and ridicule can benefit neither authors nor readers. One sentence from my reviewer in the *Saturday Review* may not be out of place here:—"If Mr. Mathew has not proved his theories to the satisfaction of all his readers, it is not from lack of knowledge or scientific methods, but from the imperfection of his materials."

Coburg, Victoria, August 16.

JOHN MATHEW

THE PRESERVATION OF BIG GAME IN AFRICA.

PAST experience in America and South Africa shows how rapidly the teeming millions born of the soil may be shot out. Writers of half a century ago describe on the veldt in South Africa a paradise of varied life, which is now irretrievably lost, through the carelessness and wastefulness of white men. Some species have absolutely disappeared, never to be seen again on the face of the earth. Others are so scarce that it is doubtful whether their power of reproduction can save the race. The fact that an International Conference, attended by delegates from Germany, France, Italy, Portugal and the Congo Free State, on the subject of the preservation of the game from destruction in Africa, met recently in London, under the auspices of our Foreign Office, shows that a widespread interest is now taken in this subject. Let us see how the matter stood previous to the meeting of the Conference—at least as regards British territory.

Excluding the settled parts of South Africa which were outside the purview of the Conference, we may observe, in the first place, that our Foreign Office appears to be thoroughly alive to the urgency of the question in those territories under their jurisdiction. They had enacted game regulations which ought to have been effective for their purpose. A 25*l.* license was imposed upon strangers, and one of 3*l.* upon residents and officials, as a necessary condition of shooting, while the licensees were limited to two specimens in the case of elephants, rhinoceros, hippopotamus, buffalo and giraffe. Fines up to 500 rupees, and imprisonment for two months, were the maximum penalties. Above all, Reserves for the game were defined. Similar regulations to the above were in force in German territory; but let us confine our attention to British East Africa as an example with which I am familiar. Here, on the best feeding grounds, there are vast herds of wildebeest, hartebeest, impala, zebras, gazelles of several species, and in lesser numbers water-buck, giraffes and rhinoceros. All these, and others, may be seen from the windows of the train as it traverses the new Uganda railway, which has now been constructed to a point about two-thirds of the way to Lake Victoria. The Kenia province, which is about 100 miles by 40, has been constituted a game Reserve. Other Reserves have been established in Uganda and British Central Africa. Each of the Foreign Powers engaged

in the Conference have bound themselves to provide similar Reserves where they have not already done so, and to maintain them as such with strictness, and much depends upon the interpretation of that word. Now this is just what we had not until recently done in the case of the Kenia Reserve.

One of the regulations provides "That public officers may be specially authorised to kill, &c." in that Reserve. Unfortunately the words "may be authorised" in this regulation were interpreted by many of the Protectorate and railway officers stationed at Nyrobo, Kikuyu and elsewhere as "are authorised," and thus as making them free of the Reserve. This laxity of interpretation had a tendency to spread, and large quantities of game were at first killed there after the arrival of the railway. A Reserve is no true Reserve which is subject to personal exceptions, and in the circumstances which I have detailed was a delusion and of little value. We may rest assured that, now that this defect has been pointed out, the Foreign Office will not be backward to remedy it; and even if it were not so, they are under an international obligation to make the Reserve a reality. We may, therefore, confidently expect that the words I have quoted, which admit of a serious leakage, will disappear. It must not be thought that the officers to whom I have referred are indifferent to the preservation of game. It is in their interest, above all others, that these regulations should be maintained, and I am confident that the good sportsmen, of whom there are many among them, are anxious to be protected against those who cannot be so described. Nothing can be stronger than their reprobation of the worst transgressors, as, for instance, of a gentleman wearing her Majesty's uniform, who, I was told, killed approximately a score of wildebeest in a day, and left them rotting on the ground. The author of this disgusting butchery was brought to book, but he passed into Uganda, and thus, sheltered by a technicality, escaped the payment of the fine. It is to be hoped that the long arm of the autocratic committee which governs both territories will ultimately reach this glaring offender.

It remains to be considered in what respects the recommendations of the Convention will strengthen the game laws in their present form. The principal recommendations of the Conference may be summarised as follows. A special and select list of animals are to be absolutely protected at all times. Another schedule comprises the species which are to receive protection for immature animals and breeding females. The sale of tusks of elephants weighing less than eleven pounds is forbidden, and finally each Power undertakes to establish adequate Reserves and to protect them from encroachment. It will be seen that these recommendations impose upon them certain obligations, and we may thus expect that the new regulations for the British territories will include a schedule of animals as sacred from molestation as the bulls of Apis. The giraffe, eland and buffalo are, at any rate, among those which are sure to enjoy this royal distinction. It is a little difficult to see why vultures, owls and rhinoceros birds, which are exceedingly useful, but are not sought for food, should have been added by the Conference to such a distinguished list. The second list, of which the breeders and young are to be protected, will doubtless include such animals as rhinoceros, hippopotamus, waterbuck, sable, greater and lesser koodoo. The importance of this will be seen when it is remembered how slowly these larger animals breed. Apart from these restrictions a limit will doubtless be placed on the numbers of all the game animals allowed to be killed under each license, a high limit being given for the common species, and a much lower one, probably not exceeding two specimens, for those in most danger of disappearance.

Infractions of this rule may be somewhat difficult to

detect, but every licensee, at the expiry of his license, should be required to furnish a return of what he has killed. This would impose a certain restraint on thoughtless sportsmen, and when the returns are collated would form a basis for a valuable tabulation of the numbers of each species killed from year to year, and serve as an indication of the increase or diminution of any species in a given area. A small export duty on skins and horns would be a useful assistance to such a return.

The maintenance of Reserves is of the highest importance for the preservation of the various species. In my opinion, the position and boundaries of the Kenia Reserve, which is perhaps the most important of all, should be reconsidered. These boundaries were selected because they happened to be the defined limits of a Province, and not because they represented the real needs of the game. A large portion of the area is densely populated and cultivated. Another considerable area is at a high elevation and covered with forest which harbours some elephants; but is of no use to the great families of grass feeders, such as the zebras, the numerous kinds of antelope and gazelle, the rhinoceros and ostrich. The great bulk of these are confined to the grass plains along the Athi River, and unfortunately its left bank only is within the Reserve. This feeding area is thus but a small fraction of the whole Reserve, and is quite inadequate to feed the vast herds; nor does it, as a matter of fact, cover their frequent migrations in search of fresh grazing, which extends to both sides of the Athi, and southwards to the plains of Kilimanjaro. The limited belt of grazing ground within the Reserve has been still further curtailed by the location of the important railway centre of Nyrobo in the midst of it, since the Reserve was constituted. This will necessarily drive the game from that part of the protected plains. It is therefore desirable that the boundaries of the Reserve should be reconsidered by competent officers on the spot, not forgetting the important assistance which would be rendered by the railway in safeguarding and watching it, provided it traverses it or skirts its boundary on one side.

Then as to the difficult question of elephants, difficult because of the high money value of their tusks. I am personally opposed to the destruction of elephants at all, on the ground that, valuable as they are for their ivory, that will soon come to an end at the present rate of destruction, and that they might be still more valuable as weight-carriers. That is, perhaps, a counsel of perfection, but that they require some far more effective protection is obvious to every one who has studied the subject. Recently an Englishman sold in Mombasa the produce of his trip in ivory for 8000/-. The hundreds of elephants necessary to produce this amount were, of course, not in the main killed by his own rifle. Some of the ivory may have been bought, but numbers of native hunters were said to have been hired for this purpose and attached to his staff, and were sent far and wide over the country. Thus this caravan must have left a broad trail of destruction for hundreds of miles. When the wealthy and powerful set such an example, how can the law be enforced against those who have the excuse of poverty. It is to be hoped that the Foreign Office will be able to devise means for the arrest of wholesale destruction like this. Although the Convention has not recommended it, is it too much to hope for the imposition of an adequate export duty, uniform at all the ports of exit, to whatever Power they may belong, and the total prohibition of the export of cow ivory?

The question of bringing resident natives under the prohibition which extend to Europeans requires to be carefully weighed. In my opinion, it is neither possible or just to stop their hunting so long as they are confined to their primitive weapon, the poisoned arrow. From time immemorial the destruction caused by the indigenous

inhabitants has not appreciably diminished the stock. The land and the animals upon it are their birthright, and to interfere with it would surely cause trouble. We are not bound, however, to furnish them with civilised weapons, and every precaution should be taken to prevent their obtaining them.

Finally, the best of rules are useless without two things—a sound public opinion among the resident whites whom they chiefly affect, and a firm and knowledgeable man to carry them out. The first exists, and I am convinced is on the increase. How should it be otherwise, unless one presupposes the most shortsighted selfishness? As to enforcing the rules, that which is the business of several officials, all of whom are engaged in office work, is practically no one's business. Let there be one man on the spot—that is to say one in each great game district, and especially in each Reserve—whose duty it is to know and to act.

E. N. BUXTON.

NOTES.

As was announced in our last issue, many of the medical schools in London and elsewhere were re-opened this week, and addresses were delivered by well-known medical men and men of science. At the Charing Cross Hospital Medical School the third Huxley Lecture was delivered by Lord Lister on Tuesday.

A COURSE of twelve "Swiney" lectures on "Extinct and Persistent Types" will be delivered in the lecture theatre of the Victoria and Albert Museum, South Kensington, by Dr. R. H. Traquair, F.R.S., on Tuesdays, Wednesdays, and Fridays from October 9 to November 2. No charge is made for admission to the lectures.

At the meeting of the Royal Photographic Society to be held on Tuesday next, October 9, the President will deliver his annual address, and present the medals awarded at the Society's Exhibition.

THE Lettsomian lectures will be delivered before the Medical Society of London in March and April next, and the oration will be given in May by Mr. F. Richardson Cross.

THE seventeenth annual meeting of the Association of Official Agricultural Chemists is to be held at the Columbian University of Washington, commencing on Friday, November 16 next.

THE fourteenth International Medical Congress will be held at Madrid early in 1903, under the presidency of Prof. Julien Calleja.

THE annual "Fungus Foray" of the Essex Field Club will take place on Saturday next from High Beach, Epping Forest. The prospective arrangements of the club include the opening of the Essex Museum of Natural History by the Countess of Warwick, on the 18th inst. The scientific winter evening meetings will be resumed in the Physical Lecture Theatre of the West Ham Technical Institute on October 27.

Science announces that Prof. H. T. Todd, having reached the age limit, has retired from the Directorship of the U.S. Nautical Almanac. Prof. S. J. Brown, astronomical director of the U. S. Naval Observatory, has undertaken the duties of the office.

ACCORDING to the *Lancet*, a scheme has been sanctioned by the Charity Commissioners by which 644*l.* left to the Royal College of Surgeons of England in 1884 will be devoted to providing every four years a "Cartwright Medal" for an essay on dental surgery. The medal will be accompanied by an honorarium.

THE gold medal of the American Philosophical Society, known as the Magellanic, will be awarded in December next for the best discovery or most useful invention in the physical sciences brought before the Society before November 1.

PROF. F. KLEIN has been awarded 800 marks by the Göttingen Society of Sciences for his *Mathematical Encyclopædia*, and the same society has awarded 500 marks to Prof. Wiecherts for that worker's seismological recording instruments.

IN addition to the medals and prizes given for communications discussed at the meetings of the Institution of Civil Engineers in the past session, the Institution has made a number of other awards in respect of other papers dealt with during the same period, *e.g.* a George Stephenson medal and a Telford premium to Mr. L. F. Vernon Harcourt, and Telford premiums to seven other gentlemen. For students' papers, the James Forrest medal and a Miller prize have been awarded to Mr. C. B. Fox, the James Prescott Joule medal and a Miller prize to Mr. J. W. Smith, and Miller prizes to four other students. The council have nominated Mr. R. F. Whitehead to the Palmer scholarship at the University of Cambridge in succession to Mr. A. H. Kirby.

A NEW technical school is to be erected in Belfast on a portion of the grounds purchased from the Royal Academical Institution, and a principal is to be appointed shortly at a salary of 600*l.* per annum, whose experienced practical advice will, it is hoped, be of much value in making the interior arrangements of the building, and in organising the work of the institution while the building operations are in progress.

PROPERTY valued at upwards of 200,000 dollars has been left by Mr. Charles H. Smith for the maintenance of the botanical specimens in the city park of Providence, Rhode Island.

WE have had pleasure on more than one occasion to refer to the good work that is being done to the cause of scientific education by the Essex Technical Instruction Committee, and are glad now to call attention to two new courses of lectures that are about to be inaugurated by the committee. A first-year's course of instruction in botany for teachers will commence at Chelmsford on Saturday, October 6, and will be continued on successive Saturdays until about the middle of May, 1901, and an elementary course of practical instruction in dairy bacteriology will commence on Thursday, October 11, and will be continued on ten consecutive Thursdays.

THE *Windward*, according to *Science*, was expected to reach St. John's by about the middle of September, but a short delay would not be surprising as the vessel started late, owing to some difficulty with the machinery, and was subsequently delayed by ice along the coast of Labrador. The arrival of the steamship is awaited with interest and some anxiety, as news will be brought, not only of the return of Peary, but also of Captain Sverdrup and Dr. Stein. The former has the *Fram* provisioned for five years, with a crew of twelve men. He planned to round the northern boundary of Greenland and to make his way down its unknown east coast to Cape Bismarck. It is said that the expedition under Dr. Robert Stein of the U.S. Geological Survey, who is accompanied by Mr. Leopold Kann, of Cornell University and Mr. Samuel Warmbath of Harvard University, was poorly equipped and left in a dangerous position. Lieut. Peary himself expected to establish his last depôt at Cape Hecla, the most northerly point of Grinnell Land just beyond the 82nd parallel, whence he intended to advance with Eskimo and sleds as far north as possible.

AT a meeting held on June 12 last at the University o. Melbourne, it was unanimously resolved to form a society to be called the Society of Chemical Industry of Victoria, the objects for the establishment of the society being: (a) to afford its members opportunities of meeting and discussing matters connected with applied and industrial chemistry; (b) generally to advance the cause of chemical industry in Victoria. It was