and several such combinations in consonantal sounds cannot apparently be mastered by the white man.

If only the Commonwealth Government could be induced to appoint some person to obtain not only the native names of the localities pierced by the railway, but the numbers, location, etc., etc., of the tribes through whose territories the line will run, think what future trouble would be averted. Some trouble is bound to ensue and tragedies may occur. The dispossessed tribes will necessarily encroach on unfriendly territory, the white man's run and the white man's vices will—as is unhappily always the case—be in the vanguard of civilisation, consequent on the completion of the line through at present untouched areas; and with the excitement given by cheap liquor, added to their natural resentment at being deprived of their ground, grave trouble is bound to ensue.

Already I have heard the subject discussed in native camps. The natives of these little known areas are very clannish, and keep to their own tribal boundaries, rarely venturing beyond them, except in numbers, and for initiation and other gatherings; and they say "it is hard enough to find food for their own people without having "that other mob" from the north coming into their country and taking their food and water from them, and mayhap bringing evil magic upon them"—that is the greatest fear of all. Even now, when a death occurs from old age, consumption, accident, or anything, and there is an "outsider" in camp, the death is attributed to the magic of the outsider and his people, and trouble ensues.

I fear I have my letter unduly long, for which I beg your forgiveness.

I must not close without congratulating you upon the literary portion of "Science of Man," which I understand is now edited by you. I enjoy reading it, and in this out of the way place it comes as a great boon, and I read it diligently.

Yours very sincerely,

DAISY M. BATES.

ABORIGINAL NAMES OF PLACES.

(By Daisy M. Bates, F.R.A.S.A., Etc.)

In dealing with aboriginal names and places, natural objects, etc., there are certain sounds in the various dialects which the many combinations of the English alphabet are unable to adequately render. Scientists generally, and philologists particularly, are now directing their attention towards perfecting an alphabet of symbols, so to speak, which will enable the student of any country and language to give to every native sound its full value. In the meantime, the Royal Geographical Society (London) has adapted a special phonetic alphabet in connection with native dialects, and has advocated its use amongst English and Continental students of native races throughout the world.

In dealing with Western Australian dialects, of which about seventy have been obtained directly from the natives, I have endeavored to adhere to the R.G.S. system, but have been compelled to amplify it by other combinations of letters in order to render as accurately as possible certain phonetic peculiarities which occur in some of the native dialects in Western Australia, and which are not covered by the R.G.S. system.

Phonetic symbols, representing special sounds, are published now and again in various scientific journals; but as these require special type in their reproduction, a combination of ordinary English letters must suffice to meet the phonetic peculiarities that are found here and there in Western Australian dialects.

For instance, a peculiar vocal sound, that cannot be rendered otherwise than as "n" with an apostrophe 'n, has been met with in the Swan, Avon, and other districts. Philologists have called this sound a non-vocalised "ng," but that does not represent it altogether; 'n-ga (mother, Swan district), and 'n-kan (mother, Avon district) are two examples which show, as nearly as possible, the sound to be conveyed. Both these words are accented on the first syllable.

Fortunately, in native names of places this peculiarity is not often met with, and so the rendering of proper names is comparatively easy. It is, however, always necessary to get the native to repeat some of the names of his camping places over and over again, as otherwise the full sound will not be obtained, since almost every native drops his or her voice in either the initial or final syllable.

The number of native names occurring within the area of a small tribal run depends upon the many creeks, waterholes, hills, rocks, or other natural feature; or a peculiar shape, or some special association connected with some spot within the boundaries of the "run." There is generally some little speciality in the spot named, otherwise it is simply called by the tribal term for "ground," "earth." Several natives have given me pencilled drawings or "maps" of their respective tribal areas, marking little circular dots for the camping places, and lines for the tracks leading thereto. These "maps" are extremely interesting from an ethnological point of view, and are also unique specimens of aboriginal draftmanship.

My method of obtaining these is to start from

a given point such as a big spring or lake, and round and about this particular spot the lesser camps, waterholes, hills, etc., are placed. A Lake Barlee native named Jilgu-gooroo drew a map of his tribal district, which shows his conception on paper of the location of range, lake and creek, which appear to form the boundaries of his run, and within which his many camping places are marked.

The term for all lakes in the Murchison district is "Ngab'baru," unless a spring or some special feature be found within them, when such spring, etc., will have its own special name. Also all Murchison ranges or hills are "Marda," any prominent or particular hill being given a distinctive name. Murchison creeks, such as they are, for they only run in the rainy season, are called "Warn," the pools and soaks along their course being specially designated. Let us now explore Jilgu-gooroo's run, starting from Yabbur-beera, which is near the Warn, or creek, which forms one boundary of the run. This spot is Jilgu-gooroo's birthplace; and not far from this place is the maiamba or "shrine" of the turkey totem, of which Jilgu-gooroo is a member. When an increase of turkeys is desired or requested, all the members of the turkey totem journey to the mai-amba, and perform the traditional ceremonies connected with its increase.

From Yabburbeera, near the creek boundary, and all along the creek (warn), the following camping places are situated: Ngarral-gabbi, Woggari, Yan'yaning, Goo'yanda, Boo'luloo, Bee'goorda, Thoo'da-ir'dara, Mar'gool, Bul'ga-burdi, and Ngur'gal-dharra. At the last named place the warn ends—like many inland creeks and rivers—by disappearing in a wide plain that forms a shallow lake or "ngabbaru" after each rainy season.

Along each side or bend of the warn towards its source in the Narda (or hills), there are the following pools, soaks, and rockholes: Yoo'ranjini, Yan'nga'ngain, Wardu, and Yoondern (near which is a small ngabbaru) on one side, and Koono-dhamba, Mulga, Mulgardanu (hill and rockhole), on the other. (The accent is generally on the first syllable). Along the Marda or range boundary are Wadn-gabbi (there is no vowel sound between the d and n in this word), Koolya-wurning (hill and soak), (Jilgu-goroo's father's birthplace), Bumburn (near where Jilgu-gooroo's initiation took place), Jaddin, and Boo'yarra.

The ngabbaru (Lake Barlee) is the next boundary, and along its length are soaks, springs, etc.: Gool-yung-ain, Yarligarri, Wardu (there are two places named Wardu on the run), Yoora-dhini, Yeerga-munga, Ngabboo-ngalgoo, Wannarung, wannarung, and Yoordain, and going towards Yabburbeera are Nyeerduna, Jooa, Doorni, and Mirgoorn camping spots.

All these camping places are along the boundaries of the run, and within these again are tracks and camping places between each boundary; for in journeying from Yabburberra to the Marda or range there is a choice of two tracks, or a zig-zag route may embrace all the camping places within the boundaries. We go by Booleea or Koordanbarna, Doggoo, or Mannanga, Bujjarung, or Nullagain, Goordoor, or Gommera (where there is a beemara, spring and swamp), Nyoorn-di, Bool'gaburding or Bo-in, Boolga, Dhoogal, Joolerdi, and on to Wadn-gabbi on the range. Coming back to Yabburbeera the route can be varied by going from Wadngabbi to Koolya-wurning hill, and thence to Thoordoo, Minnungarra, Yarriri, Murnain, Garrba, Curann'-gurann', Ngabba, Mardaganu (beemara or spring) Ngoogal-ngal'goo (Jilgugooroo's mother's birth place, where there is a ngan-ga or cave), and so by Doorni and Mirgoorn to Yabburbeera.

Going towards the Marda again from Ngoo'gal-ngalgoo a deviation can be made through the following places: Ngallooloo, Kurdaderra, Ngai-angain, Eedar, Minyung, Murnain (two places so called), Doordoong, Koordan-goordoo, Yallung-wirdi, Mooloo, Mungara-bulgong, Mung'arda-eedara, Koolingain, Ngurdawal. From Ngurda-wal we can get to Jaddin or Burburn on the Marda.

The above comprises one small tribal run of the Wajjari tribe. A glance at the map of Western Australia shows Brooking Hills to the eastward of Lake Marlee, these hills evidently being the "Marda" sketched by Jilgugooroo on his "plan." It cannot be denied that there is a more harmonious euphoneity in the aboriginal names of localities within this area than there is in such designations as Retreat Rock, Ranford Peak, Mt. Alfred, etc., which are marked on the map.

Jilgugooroo gave me the "points of the compass" by taking his own tribe, the Wajjari, as the centre. These were: Meenung (South), Yoolbarri (S.E.), Koggara (E.), Kaiali (N.E.), Mardu-iji (N.N.E.), Wardal (N.), Boogal-gurra, Bee'dungoo, Jargurdi, Weeloo-boogalga (points, and also names given to tribes between North and West), Weeloonyoo (W.), Marr'jinyoo (S.W.).

These points vary according to the tribe that is speaking, and also owing to the same name being applied to the cardinal point and to the dwellers in that direction; as, for instance, Beedungoo, which in some tribes denotes a point to the North East, and also applies to the natives living there; and Wardal, which is in a north-westerly direction, according to some East Murchison tribes, and which is also the term applied to the people living there.

What particularly strikes the student when pursuing inquiries respecting the territories of tribes or

clans, is the number of waterholes, springs, and soaks in country over which the white man has so often passed without finding any of these watering places which are so numerous to the native dwellers therein. Perhaps, however, this is not to be wondered at when it is remembered how jealously the native guards his water supply even from his own people, who are not allowed to make indiscriminate use of the precious fluid. More particularly is this care shown in the more arid areas of central W.A., where magic is brought to bear in the preservation of the spring or soak. A magic snake (called jeela in part of the Murchison district) is the "guardian spirit of most of the beemara or springs; and no unauthorised person must go near these beemara or dire will be the result. The jeela will either kill the intruder, or, which is much worse, it will take itself and the water it guards away from the vicinity, if the owners of the beemara are lax enough to permit unauthorised persons to approach the sacred precincts of the jeela and drink of his waters.

I have been shown some of these sacred pools and springs, and can quite perceive how impossible it would be for a person unfamiliar with the locality to discover them unaided. Amongst the general members of the tribe in whose district these springs are found, the place for some distance round and about the spring is "sacred" or magic ground, called "Mobburn burna" by the natives, and no young person can approach the spot, nor can any female, young or old, come near it at any time, under pain of "magic" death. Thus only the older members of the tribe have the right of entry within the sacred precincts, and very few of these will be induced to show their hidden water supply to the white man; and so many a prospector, and many a bushman has camped within a few yards of one of these hidden springs, and ridden from his camp with thirst unslaked, owing to his ignorance of its nearness, or to the reticence of the natives whom he may have encountered in its vicinity.

INVISIBLE LIFE.

There are certain natural limits, inherent in the properties of light, to the efficiency of microscopes, and these limits have already been pretty well reached. We may go a little further by the aid of artificial lighting devices, and so forth, but we are not likely ever to be able to see very much more than we do now. At the limit of sight we still meet with minute living organisms that just flicker into view, and we have evidence that there are others still smaller, which we shall perhaps never see. Dr. Roux, of the Pasteur Institute, recognised the existence of invisible bacteria some 12 years ago. He was able to handle these in the mass and observe their growth in colonies. Various efforts have been made to get at these smallest of microbes, but all the resources of oblique lighting failed to individualise them. Several means were found, however, of growing the colonies so that they could be seen by the naked eye. As it happens, these invisible bacteria, or some of them, are of economic importance, for they are at the root of troublesome epidemics in cattle, in poultry, and in the tobacco plant, while yellow fever and rabies are also ascribed to them. The bacteria of these last have lately been cultivated by Marechoux, who, by a process of continuous dilution, proves clearly that the microbe is growing in the culture tubes. No doubt each of us carries about in him a world of these invisible organisms, to which even a single white corpuscle would be a fair and spacious domain. When we remember that to be living at all these bacteria must possess a highly organised structure, that each of them is a chemical laboratory in miniature, and that the compounds of which they are built up contain thousands of atoms, we begin to appreciate the relativity of things. Each of these living specks has its life history, its hunger and thirst, if not its passion and its pride; and each is a world in which thousands of molecules are ceaselessly built up by the busy architect of life, and as ruthlessly and ceaselessly destroyed. Back of these molecules, the grains of sand in the bricks of the building, lie the atoms endowed with strange powers of choice, as it seems, a world of conflicting emotions in themselves—the phrase is hardly metaphor, for there is no real distinction between physical and psychical activity. And back of the atoms, of each individual atom, lies a whole cosmogony of electrons—and an electron is a distinction without a difference; a part of the ether which is still ether and nothing besides, or perhaps more accurately not even that, but rather a mere name for the nothingness in the midst of an eddy. When we come back from all this, and contemplate ourselves, what a piece of work is a man, and how amazing is his illusion of identity! The old comparison of society realise how faulty it was; but in truth society with to an organism is little heard of to-day, because we its corporate consciousness, its telegraph nerves, its arteries of steel along which its life-blood flows, has as great a claim to call itself an individual as any of us have—as great and precisely as little. No one really mistakes society for a person, yet how easy it is to imagine that the universes of cells within us are somehow not themselves, but ourself.

THE ROYAL COMMISSION ON MILK.

(Continued from page 2 of Cover.) From "Adelaide Advertiser," October 3rd, 1913.

To the Editor.

Sir,—Apropos of the important Commission on Milk, no doubt interesting and valuable evidence—especially that of the chairman of the Central Board of Health—has been tendered. But unfortunately the most important factors in the production and distribution of the milk supply, and its consumption, remain lamentably untouched. These are—1. Milk consists of carbo-hydrates, fat, nitrogen, albumin, and water in such proportions as Nature's supreme wisdom designed as a perfect food for sucklings of man and beast. When milk is scalded a good part of the nitrogen, dissolved by heat, is converted into uric acid—the final product of all decomposed flesh-forming substances. Hence the "scalded taste" of such milk. Uric acid is allowed to be the prime cause of rheumatic, catarrhal, and gouty diseases, and is, of course, a calamitous food for the tender child. The more important albumin is not much affected by mere scalding, but when boiled it is transmuted into albuminoid poison, the self-same thing as snake venom; the only difference being that the former is in a very dilute, the latter in a very concentrated form. Infants fed on boiled milk alone are sure to perish. Most cases of marasmus, and, some argue, all cases of diarrhoea, are due to this cause. These two diseases are chargeable with thousands of infantile mortalities. I have seen two fine, healthy lambs done to death inside 50 hours, with milk that had received less than an hour's boiling, and was intended to nourish them. The same animals would have taken a fortnight to starve to death!—a startling and suggestive fact. 2. Natural (raw) milk is the best self-protected of all foods. It teems with friendly germs, the lactic bacilli, which produce the acid that sours the milk. This is a perfect protection against ravages of the bacteria of putrefaction, and a powerful antiseptic. Whilst the lactic bacilli are allowed their legitimate business the milk is safe as the proverbial church. But the scalding of pasteurisation, and the employment of preservatives to arrest the natural process of fermentation in milk, equally destroy the bacilli. Their protection having been withdrawn, in brief time (so soon as the milk has cooled) the milk becomes supercharged with the bacteria of putrefaction—and any other in the region—because now it is as absolutely exposed to attack as it was naturally immune before. And there could be no worse pool of mischief or infection imaginable. 3. Natural milk soon sours, but is well-nigh immortal. Dr. Ralph Vincent (vide "Faulding's Journal" two years ago) relates how he buried properly (naturally) soured milk in a cloth in the ground for twelve months and then resurrected it just as it was before. But scalded milk cannot be found in a week after burial. The germs of putrefaction have devoured it. These vital facts proclaim, trumpet-tongued, that the medical theory of pasteurising milk to "dodge the germs" so protecting public health, is utterly fallacious, futile, and pregnant of limitless mischief to the whole milk-consuming community. Yet the whole demonstration is as clear as noonday, whose negation, if it exists, should easily be forthcoming. 4. Consequently it is milk that has been "scientifically" tampered with and robbed of its native protectors, the lactic bacilli, on the other hand, chemically transformed and destroyed as a food by scalding and boiling, that we have cause to fear. All attempts to improve upon Nature's ultimate wisdom, as expressed in her protection of the blessed milk, find her hitting back with relentless force and mortal results. Again and again I have seen infants at death's door, suffering from the aforementioned ailments (marasmus and summer diarrhoea) recovered in a few days by substituting for their food of chemically dead milk, destroyed in the manner shown, that of the raw, natural article. All which carries a logical, astounding lesson as to the monstrous blunder involved in substituting artificially-treated for natural milk. 5. Every summer it is the usage of health officers to issue rescripts, warning mothers to properly scald and boil their baby's milk, because germs may be present. A very necessary advice if that article has been previously pasteurised so far as germs are concerned but disastrous from the viewpoint that the boiling recommended ruins the milk and makes it more surely deadly than germs. Immediately death's harvest begins, and to the amount of hundreds in every large city, the precious babies start to droop and fall, like autumn leaves, until in Melbourne and Sydney the deaths rise to about 1,000 in a few months. And the little ones who escape the good-intentioned poisoning are such as are said to be "badly fed," i.e., their nurses permit them scraps and spoonfuls of soups, gravy, vegetable, meat, and so on, which nourishes the venom of their special food-scalded, boiled, poison-laden, unprotected milk. 6. Doubtless, it is right to protect the public against adulterations, &c.; but in the light of the above facts—presented as incontestable—it is the medical features of milk provision and control that both require and demand instant and inquisitorial attention.—I am, &c.,

CHRIS. T. NIXON.

AUTHORITATIVE OPINION.

His Honor Judge Heydon (after hearing evidence of eminent medical men, and matrons, and nurses of different institutions):—

According to medical evidence of the highest authority, the limitation of the supply twice a day of fresh milk would be nothing short of disastrous—particularly to infant life. The preservation of this morning and evening supply is due to the existence of the city and suburban dairies, yet these dairies carry on a very uphill fight against the competition of the country milk. This is proved, not only by the evidence called before us, but by the most significant fact that, during the last twelve months of which we have statistical records, the number of milking cows in the city and suburbs diminished by no less than about three per cent., notwithstanding the increase in population.