sometimes not only unscratched, but *patinated* or *weathered*.

The patination is of the kind which is now to be seen on flints on the present land surface, and is generally, and I think rightly, supposed to have been caused by the slow action of various solvents present on that surface.

Thus it appears probable that these stones from the Boulder Clay were first scratched, then broken, and left lying on a land surface sufficiently long to be patinated, and finally incorporated with the clay.

It is also apparent that if marked striations on flints are a sign of intense glaciation, then those found at the base of the Red Crag must have been at some period subjected to a much greater degree of ice-action than was present when the Boulder Clay was being formed.

J. REID MOIR.

12 St. Edmund's Road, Ipswich, July 30.

On the Sign of the Newtonian Potential.

PROF. LAMB, in the second edition of his "Hydrodynamics," made a change in the sign of the velocity-potential. Would it not be an advantage to change the sign of the Newtonian or gravitational potential also?

If this were done, the relation connecting field and potential ($F = -dv/ds$) would be true for gravitation as well as for electricity, and potential would always be potential energy divided by mass (or charge). Of course, there would be the disadvantage that the analytical definition $\gamma \Sigma \frac{m}{r}$ would have to be altered to

$-\gamma \Sigma \frac{m}{r}$, which would conflict with the corresponding

expression $\Sigma \frac{e}{r}$ for the electrical potential. Poisson's equation would also have to suffer a change of sign. However, it might be worth while to bring the physical definitions into agreement even at the cost of these analytical inconveniences. At present it sometimes happens that students are confronted with two irreconcilable definitions, one from the mathematical, the other from the physical, lecturer. The result is that they are never sure whether a plus or minus is to be used in any given case.

H. PIAGGIO.

University College, Nottingham, August 1.

A Point in Geological Nomenclature.

In his review of Prof. Haug's "Traité de Géologie" (II.) in NATURE of August 1, J. W. G. asks the question: "Should it [the 'Quaternary'] not be Quaternary?" He will perhaps be glad to be reminded of the fact that, so long ago as 1887, Prof. Hermann Credner, of Leipzig, used the term *das Quarier* (in linguistic consonance with *das Tertiär*) in the 6th edition of his well-known and invaluable text-book, and has retained it in the 10th edition (1906), breaking it up into (a) *Diluvium* (=Pleistocene) and (b) *Alluvium*, a most convenient division.

A. IRVING.

Bishop's Stortford, August 3.

A Reversible Photochemical Reaction.

In the preparation of some tungsten compounds I obtained a by-product which is reduced on exposure to sunlight, the reduction being marked by a change of colour and being accelerated by reducing agents. In the dark, in contact with the atmosphere, the original colour is gradually restored. The same effect is brought about instantaneously by oxidising agents. Will readers of NATURE who are acquainted with reactions of a similar type kindly inform me of publications on the subject?

M. RINDL.

Grey University College, Bloemfontein, July 8.

NO. 2233, VOL. 89]

NATURE AND MAN IN AUSTRALIA.¹

PROF. BALDWIN SPENCER and Mr. Gillen are honoured by all ethnologists as the authors of two notable books on the tribes of Central Australia which afforded us more detailed information about the peoples they visited than had previously been given concerning any other Australian tribes, and at the same time gave rise to more discussion than has befallen any other records of savage men. Their last book is, from one point of view, a supplement to their earlier works, and from another it may be regarded as an independent record of a more general and popular character. "Across Australia" is not, like its forerunners, a monographic study of certain tribes, but, as its name implies, is a running commentary, so to speak, of a transverse section through the continent explained by two keen and experienced naturalists, one of whom has spent many years in the heart of the continent and had wandered hither and thither. The present account, therefore, is not the description of a single expedition, but combines the experiences of several journeyings, except so far as the most northerly third of their route is concerned.

The broad geographical features of Central Australia are clearly explained; the authors evidently incline to the view that a general desiccation, which dates from the Pleistocene period, is still taking place. The desert and poor steppe conditions and their bionomics are well described and illustrated; Fig. 19, with the mesas in the background, might very well be a photograph of a typical scene in New Mexico, except that the scattered clumps of vegetation are not sage brush. The characteristic plants of the several geographical areas are described, and attention is directed to a change of flora or fauna during the passage from south to north.

The keynote of the greater part of Australia is drought, and our authors give abundant evidence to show how all living things have to accommodate themselves to variable periods of greater or less desiccation alternated by copious rains and even floods, which subside and disappear with great rapidity. The inexorable necessity is laid upon plants and animals to take the utmost advantage of the very transient humid conditions, and to protect themselves as best they may against drought. The aquatic animals especially have adapted themselves to these variable conditions: very remarkable in this respect are several species of frogs belonging to three genera, which fill themselves, more particularly their bladder, with water till they become spherical, then burrow a foot or so in the mud, and thus tide over a year or eighteen months of drought. "The water is quite pure and fresh, and the natives take advantage of this supply when they cannot otherwise secure any." Water-beetles, snails, and other aquatic animals also aestivate, and their young have to mature quickly in order to take advantage of the

¹ "Across Australia." By Prof. Baldwin Spencer, C.M.G., F.R.S., and F. J. Gillen. Vol. I. Pp. xv+254+plates. Vol. II. Pp. xviii+255+515+plates+maps. (London: Macmillan and Co., Ltd., 1912.) Price 21s. net.

wet spell, otherwise they perish. The temporary pools swarm with small crustaceans, some "which are closely allied to one another have red blood and others have not. For example, the various

Those who are interested in the doings of natives will find first-hand accounts of the tribes met in the south-to-north traverse, the matrilineal Urabunna,

FIG. 1.—Ceremony of Alkira-Kiuma, Arunta tribe. Throwing the novice up into the air. From "Across Australia."

species of *Limnadopsis* and *Limnetis* are quite colourless, whilst their close allies, *Estheria lustraria* and *E. packardi*, have red blood. Whether it be connected with this fact or not, it is interesting to notice that the *Estherias* seem to be able to live longer than the colourless forms. . . . Speaking generally, the smaller the animal is, the more abundantly you find it."

Among other Australian anomalies is the finding of a true crab in the dry steppe lands of Central Australia. "It is apparently the same form, *Thelphusa transversa*, which has been recorded from Cape York in the north-east of Australia, and its presence in the centre of the continent points back to a time when there was a great inland sea. The crab has evidently been left behind, and has adapted itself, not only to fresh-water life, but to conditions which would, at first sight, appear almost fatal to crab life." In arid parts of Mexico and Colorado the honey ant stores up honey in its body so that the abdomen becomes spherical; so does the *Melophorus inflatus* of Central Australia; our authors discovered two species (*M. cowlei* and *M. midas*) in which the abdomen is not so swollen:

"evidently these two are not so fully specialised in this respect." There are many other notes on the habits of animals which should not be overlooked by zoologists.

band of Australia, and to pick up scattered information concerning the utilisation of the plants and animals by the aborigines. The volumes are extremely well illustrated; all the figures and

FIG. 2.—Performance of a sacred ceremony of the sun totem, Arunta tribe. From "Across Australia."

plates, except a few chiefly giving views of scenery, have, however, been previously published. The book is written in an interesting manner, and deserves a large sale. A. C. HADDON.