

them is improper. A nomenclatural technicality should not be allowed to obscure the facts.

(2) "A subspecies elevated to specific rank retains the same name, unless the resulting binomial has been previously published." However, *Juncus acuminatus robustus*, Engelm., 1868, though a valid species, does not become *Juncus robustus*, because of *Juncus robustus*, S. Wats., 1879. Further on, we read, "A specific or subspecific name is a homonym when it has been published for another species under the same generic name. Two subspecies of the same genus shall not retain the same name." If two subspecies in a genus may not retain the same subspecific name, as I suppose is intended, though not clearly stated,¹ may a species and a subspecies do so? It appears logically to follow, though again it is not stated, that they may not. Hence in the above case of *Juncus*, the Watsonian *Juncus robustus* is invalid from the first, because of the Engelmanian subspecies, and there would result from the combination of these rules the dropping of the name "*robustus*" altogether, which seems absurd.

(3) "A generic or subgeneric name is a homonym when previously published, or proposed in print, for another genus." But we are not told whether the publication of a subgeneric name precludes its use in another sense for a genus, or whether when a subgenus is elevated to generic rank it is obligatory to use the subgeneric name, if it is not a homonym. These things are recognised by zoologists, and it does not seem proper for the botanists to ignore them in their code, and then do as they individually please.

(4) Names are considered identical when "mere variations in the spelling of the same word." This seems to me a dangerous rule, and illogical since it ignores the fact that names belong to the objects they designate, independent of derivation. By considering derivation, one can prove that crab and crayfish are "mere variations" of one word,² and most assuredly Theodore and Dorothy are one! The examples cited in the code expressly exclude differences of gender in generic names as valid distinctions, and while the specific names Greenei and Greenii (after Greene and Green) are admitted, we are not allowed *virginianus* and *virginiensis*. In this last case, I think a difference in the sense of the adjective may be detected, apart from its application to the plant. It is the same difference that is found between the statements that a man is English, and that he lives in England. One refers to quality, the other to place.

(5) Hybrids may be named like species, with the sign \times before, as \times *Salix caprea*. I should prefer to write *Salix \times caprea*. The naming of hybrids in this manner seems necessary, on account of the possible instability of the combination-names. Thus *Castilleja confusa \times acuminata*, Ckll., *Bot. Gazette*, April, 1900, p. 280, is better called *Castilleja \times Porterae* (a name I have long had in MS.), because the plant formerly known as *acuminata* is now called by a different name. T. D. A. COCKERELL.

Colorado Springs, Colorado, May 21.

The Formation of Coral Reefs.

SEEING (*NATURE*, April 21, p. 581) that this delicious bone of contention has once more been clawed from its resting place, I would beg editorial permission to join in discussing it.

That dead coral is soluble in warm seas is indisputable, but that solution in coral regions exceeds deposition is an issue to be tried not in a European laboratory, but on a coral reef. It is claimed that the lagoon of an atoll was excavated by solution, and that the matter removed was poured into the open sea through the reef channels. In opposition to this I reply that the central floor of a lagoon in process of excavation should present a bare surface of eroded rock like the basin excavated by a waterfall; but the middle of a lagoon floor has been shown by many observers, and especially by Mr. G. H. Halligan's boring, to consist of weed, mud, sand, and shingle. These are indications of an area of accumulation, not erosion. Let those who believe that the lagoon floor is dissolved away produce water from the seat of action heavily charged with solution!

Again, it is contended that the water flowing from the

¹ It is, however, clearly indicated by an example given.

² Krebs, krebs, crab; krebis, ecrevisse, crayfish, and American, crawfish!

lagoon through the exit channels bears away in suspension and solution both matter excavated from the lagoon floor and matter washed by the waves into the lagoon. In denying that either is so drained away to any considerable extent, I would point out that water unarmed with sediment has no cutting power; but if the exit channels conveyed heavily charged water, the sand blast thus produced would cut to pieces every living thing in the passage. By my observations these passages are well carpeted with luxuriant life. To elucidate this important point the next biologist to report on coral fauna might be instructed to survey a main lagoon passage in detail.

If, as I maintain, the lagoon is an area of rapid accumulation from both growth and deposition, then, if no subsidence of the atoll occurs, the lagoon must in time be filled in. Every phase from a chain of islets to an atoll filled in solid is represented in the Pacific.

The destiny of every lake and pool on the earth's surface is to be obliterated by alluvium. It is here contended that the inevitable fate of a stationary atoll is the same, the only difference being that matter is poured from above into the terrestrial lake, whereas it is washed up from below into the atoll lagoon; but, as Darwin observed, while subsidence continues it will preserve to the atoll its lagoon.

CHARLES HEDLEY.

Australian Museum, Sydney, N.S.W., June 20.

The Traction of Carriages.

IN reference to a letter on the above subject in your issue of July 21, the draught of a vehicle depends largely, though not entirely, upon the ratio that exists between the distance from wheel to wheel and the height of the centre of gravity from the ground. If the wheels are far apart and the centre of gravity low, the carriage is hard to draw; if the wheels are closer or the load higher, the draught is lighter.

The reason for this fact may, I think, be readily seen by the following illustration:—Let us suppose a bicycle and rider, the centre of gravity four feet above the road, and vertically mid-way between the wheels. For the present purpose we will disregard the effect of springs and of speed. If the front wheel goes over a stone, say, two inches high, the centre of gravity, or load, is partly lifted vertically and partly thrown back over the hind wheel, describing, with relation to the machine, part of a circle having its centre at the point where the hind wheel touches the ground; and if the wheels are four feet apart, centre to centre, the load is raised about half an inch and moved backward to a much greater extent.

But we can imagine a bicycle of the same weight and having the same load with wheels, say, forty feet apart, and if this machine meets the same obstacle the load will be lifted nearly a full inch, the back-throw being scarcely perceptible; or, on the other hand, we may conceive of a bicycle with wheels four feet apart and the centre of gravity forty feet high, in which case the two-inch stone will scarcely lift the load at all, but only send it (dangerously, no doubt) back over the hind wheel.

Heavy draught depends upon, or is caused by, having to lift the centre of gravity rapidly, and may be lightened by easy springs, large wheels, putting the load high, or putting the wheels near together.

CECIL G. SAUNDERS.

Tower House, Canonbie Road, Forest Hill, S.E., July 25.

The Word Cingalese.

ON p. 131 of the current volume of *NATURE*, the expression "Cingalese fishes," and on p. 78 of the same volume the expression "Cingalese outlier" are found. The word Cingalese is also used in the "Cambridge Natural History" (Mollusca) to denote a subregion. In the first place the word should be spelt Sinhalese, the form above quoted being a quite incorrect transliteration. In the second place, the adjective corresponding to Ceylon is Ceylonese, the word Sinhalese meaning "of or belonging to the Sinhalese race."

Ceylon, July 6.

A. K. COOMARASWAMY.

Residual Affinity.

IF Mr. Pickering has imagined that fractions of a charge are necessary, and has not discriminated between fractions of a charge and fractions of a bond, it is not surprising that his contribution of thirteen years ago failed in impressiveness.

OLIVER LODGE.