There is a linguistic family in Oregon, the Kalapuya, the dialects of which show exactly the same peculiarity concerning the substantive nouns. In the Atfálati dialect, once spoken near Gaston and Wappatoo Lake, west of Portland, almost all substantives begin with a-, as apúmmeig, *woman*. Among the few exceptions, I now remember only mäntäl, *dog*. All adjectives of Atfálati begin in wa-, u-a-, ua- in their form for the singular, and this coincides exactly with the radix of their numeral for *one*. Although what we call *articles* do not frequently appear in American languages, the proclivity of these to agglutinate with their nouns is a well-known fact though more so when the article is suffixed than when prefixed to the noun, *cf.*, the Dakota, Otomi, Basque, and Scandinavian. In the Chonook jargon the French article *le*, *la* was by the Indians fused into one word with the noun following: Lipipan, *le ruban;* liblō, *le bleu*, or purple; lilu, *le loup*. Thus I argue that the Atfálati numeral for *one* became an indefinite article *a* and was coalescing with the noun following it into an inseparable unit.

The same thing occurred in the case of the Kitonāqa prefix āq-, āqk-. We find it, though pronounced somewhat differently, as o'kē, ō'kwē, *one*, the first numeral, *cf*, aiwōm tla ō'kwē, *ten and one*, viz., "eleven;" in what Chamberlain calls the independent form of the substantive and adjective, which through this addition differs from the form as used in composition; tlū, *snow*, āqktlū (independent form). The same radical also occurs in āqktō, *bear one year old;* aqksākes kō'kwes, *one leg;* ā'qkī, *and, again, more* (perhaps "one more" originally).

I therefore consider this prefix as an obsolete indefinite article, which has gradually fused into one solid body with the noun following; we are at leisure to consider it now as a definite or an indefinite article in its original state. It was once *an article* and is now fossilized, like the a- of the Kalapuyan dialects, into the body of the word.

MAMMOTH CAVE IN MARCH.

BY H. C. HOVEY, D.D, BRIDGEPORT, CONN.

I HAVE long been curious to see the great cavern amid wintry surroundings. The capricious season is not without charms to one who can appreciate nature's changing moods. As our train pulled out from Louisville we saw that the tumultuous yellow flood had wholly obliterated the falls of the Ohio, as well as the costly canal around them, and had inundated the broad flats by the great bend below to a breadth of twenty miles. The storms of rain and snow swept over the Kentucky hills that guard the line of the Louisville and Nashville Railroad, but could not wholly hide the rugged grandeur of their naked crags and pointed peaks; while the torrents, rolling southward between bright-red ocherous banks, were far more interesting than their dry courses could be in sultry August. There are said to be five hundred caves in Edmondson County, and several of these are lauded by their owners as rivals to Mammoth Cave. This petty jealousy cropped out in the remarks made to us on our arrival at the Glasgow Junction, where we had to change cars, to the effect that Green River had broken into Mammoth Cave so as to make its avenues impassible; that visitors were not admitted at this season; that the hotel was literally dropping to pieces and had been closed; and, in short, that we had better turn our steps in some other cavernous direction. This local jealousy has occasionally even taken the malignant form of wanton injury to the estate and ugly threats of violence to the manager. Whenever a grander cavern than Mammoth shall actually be discovered (which may sometime be the case), let its claims be allowed; but thus far it stands as the noblest specimen of its kind. As such it has an interest for all patriotic Americans. True, our interest is weakened slightly when we find ourselves taxed fifteen cents per mile on the Mammoth Cave Railroad — a tariff never relaxed by the Nashville company even for excursion parties of hundreds of passengers; and it is further impaired on finding the ancient hotel, if not literally dropping to pieces, yet far from luxurious, or even thoroughly comfortable. It is a great architectural curiosity as having been evolved from a log-cabin germ planted in 1812, but it fails to meet the demands of the modern travelling public. While admiring the good taste that keeps the surrounding forest intact in its native wildness, we should appreciate better walks by which the woodland charms might be made more accessible. We would also respectfully remark that these are days when electric lights are quite generally used, in preference to lard-oil lamps, and nowhere would they be more serviceable than in illuminating the grand subterranean realm of Mammoth Cave, as has long been done at Luray. It is our conviction that the owners of this splendid estate could make no more remunerative investment than by the timely adoption of these friendly suggestions.

And yet justice should be done to the improvements already made by the enterprising manager, Mr. H. C. Ganter, about the hotel and grounds, and especially within the cavern itself. One of the first localities we explored on this visit was Audubon Avenue, the first right-hand branch from the main cave, which when we last saw it was heavily encumbered throughout with great fragments of limestone that made the going very tedious. These have all been removed at great expense, some of them being dumped into a deep ravine, and others piled up in formidable, yet shapely, walls. One object of all this is to prepare the way for the practical cultivation of mushrooms on a scale equal to that at Frèpillon and Méry, in France. Over $5,000 have already been spent in this work under the direction of skilled gardeners, and ultimate success is looked for. Another striking change accomplished recently is the opening for the public of what is to be known henceforth as Ganter Avenue, and which has hitherto been passable only for the guides and hardly for them. It is a wonderful fissure, or rather series of fissures, extending through solid limestone for 8,500 feet, as actually measured by us. The passage, until recently widened, used to be for a great distance only about eight inches wide. But by patient drilling and blasting it has been enlarged so that persons of ordinary size have no serious difficulty in going through. Indeed, it has already been threaded by perhaps a thousand visitors. It twists and winds in the most curious manner, more than two hundred turns having been actually noted, and it is well worth seeing for its own sake. But the main advantage derived from it is that when River Hall is flooded, as it is liable to be during more than half the year, tourists can thus gain the crystalline regions beyond and reach the extreme end of the "long route;" and should they ever be caught there by a sudden rise of the waters, they have this safe way of exit always available. At the time of my visit Echo River, Lake Lethe, the Styx, and the Dead Sea were all united into one vast body of water, extending from Bacon Chamber to Cascade Hall, its depth from surface to bottom being at least 100 feet; and the water was backing up into Gorin's Dome, the Bottomless Pit, and all other pits in the cavern; but not a drop in Ganter Avenue, through which we safely passed to the regions beyond and returned dry shod. The temperature, both of the water and air, is uniformly 54° F. all the year round; the exceptions being in localities where a strong draft lowers the mercury a degree or two, or where the warm air from the lamps, fireworks, etc., gathers in close domes, whence it cannot immediately escape. On the whole, I do not hesitate to recommend Mammoth Cave as a delightful winter resort. The climate is salubrious always, and the sole difference in the cave itself from its summer condition is in the subterranean waters; and even here, if suitable boats were provided, guests might enjoy a charming sail, and they would find the passage-way over Lake Lethe endowed with the same marvellous echoing peculiarities that have made Echo River so famous. By the way, I have never heard mention made of the quite different but equally wonderful acoustic properties of the Chief City. This is an immense hall, 450 feet long by 175 feet wide (as measured by us) in which many Indian relics are found. Stationing ourselves at its opposite sides, as far apart from each other as we could get, we had no difficulty in conversing in ordinary tones or even in the very softest whispers, every faintest sound being faithfully carried across the hall.

It is not my object now to describe the familiar wonders of the great cavern, always the same, winter and summer, and that

have been described a thousand times. But I take pleasure in directing public attention to two adjacent caverns, belonging to the Mammoth Cave estate, and that are seldom visited, though each for different reasons should challenge admiration. The White Cave (so named eighty years ago on account of the whiteness of its formations) is entered at a point half a mile from the hotel. Its floor is cut by numerous channels, through which water runs so pure as to be almost invisible, leading to exquisite pools with ruffled and incurved rim, none of them being more than two or three feet deep. The roof is for the most part low and fretted with numberless dainty stalactites. Advancing, we find the floor encumbered with huge blocks of limestone, and the cave divided longitudinally by a wall of noble stalagmites far beyond anything of the sort to be seen in the adjacent larger cavern. It ends in a profound pit, named by us Bishop's Dome, for our guide, Eddie Bishop, who, so far as is known, was the first to descend to its bottom, which feat he accomplished in our presence. It is supposed that the White Cave is connected with the Mammoth Cave at some point near the end of Audubon Avenue, or possibly at Little Bat Avenue; but this remains yet to be proved.

For ten years past I have heard of Dixon's Cave, but had never been informed that it was in any way remarkable, except for having possibly been at some remote period the original mouth of Mammoth Cave, and even this seemed to be a matter of doubt. Being desirous of seeing it, simply for the sake of completing my work, I donned my usual cave attire, and sallied forth one March morning with Bishop the guide. Snow had fallen to a depth of four inches, through which the brave daffodils in the garden lifted their golden heads, while the more modest spring flowers that had been tempted to bloom too soon lay hidden under the wide, snowy blanket. The ice-laden trees glistened in the vernal sunshine. As we broke our way through the budding underbrush of the oak opening, tracks were visible of rabbits, foxes, and wild turkeys. After going thus for several hundred yards, we were confronted by a wide chasm in the hillside, into whose yawning gulf great moss-grown forest-trees had plunged headforemost. Creeping under or climbing over their prostrate trunks, we gazed awe-stricken into the mightiest cavern-mouth I ever saw. The whole cavern is a single hall, which, by our measurement, is 1500 feet long, from 60 to 80 feet wide, and from 80 to 125 feet high, gradually curving from southeast to due south; the dimensions being quite uniform from end to end and from top to bottom. The roof is decorated here and there by alabaster stalactites, and at the time of our visit it was also appropriated by myriads of hibernating bats, clinging in great clusters like swarms of bees. The floor was long ago gone over by the saltpetre miners of 1812, who had left the rocky fragments piled in what might be described as stony billows lying across the cave, each wave being 40 feet through at the base and rising 25 or 30 feet above the true floor. At the extreme end the mass of nitrous earth seemed not to have been disturbed, over which we climbed to the very roof, and amid whose nooks we diligently sought a way of access to Mammoth Cave. We did not succeed; but subsequent outside measurements satisfied us that we had reached within 60 feet of the desired goal, and that by suitable excavation the connection might be made. Before leaving Dixon's Cave, I stationed Bishop at the inner end, while I gained a point midway where I could see the white sunlight as it was reflected from the snow, and then had him ignite three Bengal lights. The effect was indiscribably grand as their brilliant illumination crept through the black darkness till it cast my shadow on the fainter sunlight itself, like a giant spectre, and finally blended with the outer light, thus enabling me to take in at a single glance the vast dimensions of what may be justly styled the most magnificent subterranean hall in the known world. On our return to the hotel, we made our way by the mouth of Mammoth Cave and saw it environed by trackless snow, its mosses and vines spangled with silver, and the wild, pattering cascade falling from the rocks above to the rocks below as it has done for ages. And, turning away, I echoed with all my heart the guide's naive exclamation, "I fairly love old Mammoth Cave."

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Anatomical Nomenclature.

As the years go by the movement for a thorough and scientific revision of biological nomenclature gains in depth and strength, and we have every reason to believe that great and lasting benefits will accrue to science as the result of these attempts to increase the precision and fitness of our scientific language. Believing that every increment, however small, is a distinct gain if it only possess the qualities above mentioned, I propose the following modifications in anatomical nomenclature for the consideration of all anatomists interested in this important work.

In my paper on the vertebrate ear,[1] I brought out in considerable detail the two following considerations regarding the morphology of the auditory nerve and made certain suggestions looking to an improved nomenclature of these parts. In the first place it was shown that anatomists had not adequately recognized the true nature of the auditory nerve owing to the persistence of the older view of the nature of the auditory organ, which was regarded as a morphological unit. Such a well-defined unit could only be supplied by an equally well-defined (single) nerve. It was there for the first time proposed to recognize in our terminology the fact that the auditory nerve is composed of two very thoroughly separated parts, both as concerns their central ends and their peripheral origin.

In the second place it was brought out that these two parts showed certain important anatomical relations to two other cranial nerves from which these branches of the auditory had in all probability arisen during phylogenetic development. The names proposed are N. auditorius ramus utricularis and ramus saccularis, or the utricular and saccular nerves, respectively. This nomenclature is based on a very extended study of the comparative morphology of the acoustic apparatus. These terms are superior to and in every way perferable to the other current designations such as N. cochleæ and vestibuli, or N. superior and inferior.

The terms, N. vestibuli and N. cochleæ, are ill-chosen, from the fact that the morphology of the "vestibule" and its parts as conceived by the anatomists who first proposed this term has no real existence. On the other hand, the term N. cochlearis is unsuitable, not to say inadequate, from the fact that this nerve is not solely a cochlear nerve since its trunk contains nerves to the "vestibule" as well, viz., the saccular and posterior ampullar nerves wherever these are not provided with separate foramina. The central relation of these two nerves is always with the mass of cochlear fibres in those forms possessing an enlarged cochlear apparatus, as well as in the more primitive condition of the auditory organ.

While engaged in reconstructing our anatomical nomenclature it is very desirable that we choose those terms which express the present condition of our knowledge and give promise of being adequate for the future as well, for, I take it, the recent movement for a betterment of biological nomenclature is dominated by the universal desire for as simple, short, and expressive a terminology as shall be adequate not only to the science as it exists to-day, but also to its expanded condition in the not distant future. None of these conditions are fulfiled by any of the terms yet applied to the ear-nerve except the two, utricularis and saccularis.

No broad-minded anatomist will desire to retain names in human anatomy that are inapplicable to all other vertebrates possessing the homologous arrangements of the parts under consideration. Not all vertebrates, not even a majority of them, possess a cochlea, consequently we should have to provide another name for the same nerve in lower forms or else have the anomaly of an animal without a cochlea provided with a "cochlear nerve."

[1] A contribution to the Morphology of the Vertebrate Ear, etc. Journ. Morph., VI., 1892.