Nasalizing is a prominent feature in Kayowe phonetics, more so in the vocalic than in the consonantic series No word begins in l or w. Final syllables of words terminate just as often on a consonant as in a vowel, but all other syllables usually end in a clear or nasalized vowel. Every diphthong is adulterine; that is, every combination of two colliding vowels differing from each other can be pronounced as a monosyllable and a dissyllable. Thus we can pronounce as well ze-iba as zeiba arrow. The fact that every vowel can become nasalized (and many of the consonants also) is one of the curious features of the language. This nasalization is either the one observed in the French an, in, on, un, or it consists in the addition of an n to the vowel. All these Kayowe peculiarities are very commonly observed in the majority of American languages, and also in most of the unwritten languages of other parts of the world. The standard orthography which is adopted for recording a written literary language exercises undoubtedly some influence upon the pronunciation of the natives, but where the language is not fixed by writing, we perceive constant alternation of the sounds pronounced with the same vocal organ, as of the gutturals, dentals, and labials among themselves.

"This is also the case in Kayowe, and a full list of the sounds in it is as follows:

CONSONANTS:

Gutturals: k, g, kh (aspirate), h, ng.
Palatals: y.
Linguals: ḱ, g̱, sh, l.
Dentals: t, d̲, s̲, z, n, nd, 'dl.
Labials: p, b, f, w, m, mb.
VOWELS: a, ā, â, ä, e, ē, ĕ, (the primitive vowel), i, ī, î, o, ō, u, ū, û."

TYPICAL THIN SECTIONS OF THE ROCKS OF THE CUPRIFEROUS SERIES IN MINNESOTA*.

By PROFESSOR N. H. WINCHELL.

This paper was in pursuance of the same line of investigation as that by the same author read last year before the Association, but gave the detailed methods by which general results had been attained in the study of the stratigraphy of the cupriferous rocks. By means of the microscopic examination of the crystalline rocks of the series, two groups of rocks were discovered, one being those generally accepted as igneous by Pumpelly, Chamberlin and by Owen, and the other the result of change from the sedimentaries. The former one dark colored and heavy, consisting essentially of labradorite, augite and magnetite, but the latter are lighter colored, generally showing a reddish tint, and consist essentially of orthoclase, quartz and hornblende. It is the latter group that in this connection possesses the greatest interest, as the author regards them as the true equivalents of the shales and sandstones that in some places are seen interbedded, without metamorphism, with the igneous rocks of the other group. They play a very important part in the geology of northeastern Minnesota, where, in their varied lithology, exhibiting different stages of crystallization, they not only are spread over a large geographical area, but afford some of the most interesting geological studies.

The author suggested that probably the titaniferous iron ore which is so largely associated with the igneous rocks of the cupriferous series, had its origin in the ferruginous shales of the sedimentary series, by the reduction of the oxides with which they are colored, at the time of the igneous disturbances.

The paper was accompanied by a series of fifty thin sections made by the author, with brief descriptions, and by samples of the rocks from which they were taken, intended to illustrate the lithological distinctions pointed out.

* Read before the A. A. A. S., Cincinnati, 1881.

WORKED SHELLS IN NEW ENGLAND SHELL-HEAPS.*

By PROF. EDWARD S. MORSE.

Mr. Morse called attention to the fact that heretofore no worked shells had been discovered in the New England shell heaps. A similar absence of worked shells had been noticed in the Japanese shell heaps. Worked shells were not uncommon in the shell heaps of Florida and California. Mr. Morse then exhibited specimens of the large beach cockle (Lunatia), which showed unmistakable signs of having been worked. The work consisted in cutting out a portion of the outer whorl near the suture. To show that this portion could not be artificially broken he exhibited naturally broken shells of the same species, both recent and ancient, in which the fractures were entirely unlike the worked shells.

A REMARKABLE INSTANCE OF RETENTION OF HEAT BY THE EARTH.†

By H. C. HOVEY.

The fact is well known that heat may be retained for a long period by the rocks and soils of the earth; but it is seldom that dates can be fixed with approximation to accuracy as can be done in the instance the particulars of which are now given.

My attention was called, a year ago, by Mr. James Hudson, manager of the Albion mines, in Pictou county, Nova Scotia, to a peculiar area including about two acres of ground, where the snow never lay long without melting, and the frost, even in severe winters, never penetrated but for a short distance. All over this space are scattered fused masses of clay and ironstone, resting on the outcrops of what are locally known as the "Main" and the "Deep" seams of bituminous coal, which at this point are about 450 feet apart and partially affecting the outcrops of other seams. On inquiry as to the probable date of the fire that had left this area of scoriæ and ashes, I was told that this portion of Nova Scotia was visited early in the seventeenth century by French explorers, and that an account of the harbor called Pictou was given in 1672 by Monsieur D'Enny, who was appointed Governor of the Gulf of St. Lawrence in 1654. The name "Pictou" is said to be derived from a Micmac word signifying *fire*; and the traditions of the Indians still point to this locality as having been, a long time ago, the scene of a fierce and long-continued fire, which made them avoid the place as being visited with the anger of the gods.

The coal measures of Pictou were discovered in 1798, at the very point now described; and the discoverers represented the spot as covered with ashes, over which grew large hemlock trees. About twenty years ago, while a drain was being dug in this locality, a tree was cut down that showed 230 rings of annual growth; and three feet below the root of this tree a large piece of wood, fashioned by some sort of axe, was found in a good state of preservation. It is Mr. Hudson's opinion that at least 300 years must have passed since the extinction of the fire at this point, and it is known that none has been rekindled since; its ignition may have been effected by chemical action, or by a stroke of lightning, or by artificial means applied to one of the so-called springs or feeders of inflammable gas that issue along the outcrops of these unusually thick seams.

Last spring it was found necessary to sink a small pit at the crop of the Deep seam on this area, in doing which

* Read before the A. A. A. S., Cincinnati, 1881.

† Read before the A. A. A. S., Cincinnati, 1881.

the facts were obtained concerning the long retention of heat by the earth, to which I have already referred. Mr. Edwin Gilpin, Government Inspector of Mines, has kindly placed at my disposal what information he could gather on the subject, which I give, using, to some extent, the language of this careful and accurate observer. Mr. Gilpin has prepared a comparative view of sections of the same strata, made only a short distance apart, the design being to exhibit the changes made by igneous action.

The *present section* is taken at the new pit sunk by the Albion Mines Company on the burnt area; and what is termed the *original section* is one given in Sir William Logan's Report of the Geological Survey of Canada, 1869, p. 69. The distance between the localities where these two sections were made is so small that the comparison is at least instructive, and answers our purpose as well as anything that can be had.

Present Section.	ft. in.	Original Section.	ft. in.
Surface of burned clay	22. 0	Black, argillaceous shale, with many bands of iron-stone 1 to 2 inches thick. Total thickness 144 ft. 6 in.	2. 6
Band of hard scoriæ	4. 0	Brown carbonaceous shale	1.10
		Bad coal	0. 2
Reddish ashes	3. 0	Good coal	3. 7
Hardened shale	2. 0	Black shale with iron-stone bands	1. 2
Good coal (being upper part of the Deep Seam)		Good coal	3. 5
		Coarse coal	0. 8
		Good coal	3. 9
Depth of Pit	32. +	Coarse coal	0.11
		Good coal	3. 4
		Coarse coal	5.10
		Total thickness of the Deep Seam.	22.10

The surface cover consists of clay, with boulders of sandstone and layers of gravel. The small portion of the 144 feet of black argillaceous shale filled with iron-stone balls, passed through by the shaft, has been converted into an almost continuous mass of scoriæ, very hard and compact, and difficult to drill through.

The next layer represents the upper portion of the deep seam, which has been completely burned away, leaving a *compact, laminated reddish ash*. And it was in this ancient bank of ashes, known to be more than 300 years old, that the retention of heat was observed, which it is now my object to place on record. Immediately on opening the pit, the heat of the ashes, at a point 30 feet below the surface, was tested by a reliable thermometer, and was found to be 80° Fahr. at a time when the surface temperature varied from a minimum of 45° to a maximum of 65° Fahr.

Soon after an opening had been made through the pit to the workings in the mine, the air-currents caused the temperature rapidly to fall to the normal point.

The consideration of the gradual radiation of the heat of the earth suggests the idea that abnormal increases in the temperatures of deep mines may be due in some cases to the presence, at comparatively short distances, of masses of heated matter, which are, geologically speaking, modern, though they may be historically ancient.

Recovery of Old Vulcanized Caoutchouc.—The pieces are heated in contact with steam, when the sulphur is volatilized and the caoutchouc melts and is collected as a liquid, used in preparing water-proof covers, etc.

Radiophony.—Professor Mugna, repeating M. Mercadier's experiments, in which an intermittent beam meets a smoked surface within a glass tube, containing aqueous or ammoniacal vapor, and furnished with an ear tube, adds to the effects by attaching a small microphone to an elastic membrane closing the tube. By this means he finds it possible to operate at a sufficient distance from the interrupting disc to render its noise no longer disturbing.

PILOCARPIN:—ITS ACTION IN CHANGING THE COLOR OF THE HUMAN HAIR.*

By D. W. Prentiss, M. D. Washington, D. C.

Pilocarpin is an alkoloid of Jaborandi and the active principle.

Jaborandi is a Brazilian drug recently introduced into medicine.

The leaves are the official part of the plant. (Pilocarpus Pennatifolius.)

The effect upon the human system is powerful and peculiar.

(It produces profuse sweating and salivation, and stimulates the growth of the hair.)

Two cases were reported.

In the first case, the medicine was given to relieve uraemia consequent upon suppression of urine due to *Chronic Pyelitis*.

The patient was a lady twenty-five years of age, a blonde of petite figure.

The pilocarpin (hydrochlorate) was administered by hypodermic injection, commencing December 16, 1880. and being continued at intervals until February 22, 1881. The usual dose given was one centigram, but on several occasions this dose was doubled.

The object of its use was to eliminate urea from the system by sweating and salivation.

The immediate effect produced was profuse sweating and salivation, calculated to amount to not less than fourteen pints. (See Phila. *Med. Times*, July 2, 1881.)

The result to the patient on each occasion was great exhaustion, but the ureamic symptoms were relieved.

Twenty-two "sweats" were administered in all, and from thirty-five to forty centigrams of *pilocarpin were used*.

CHANGES IN THE COLOR OF THE HAIR.

Specimens of the hair were exhibited to the section, as also a colored plate showing the changes in the color.

Two specimens dated respectively November 1879, and November, 1880, were of a very light color, tinged with yellow, and showed that the color of the hair had not changed during that year.

The third specimen dated January 12, 1881, was a chestnut brown, and the fourth dated May, 1881, almost pure black.

The administration of the Pilocarpin began December 16, 1880, the change was first noticed December 28, 1880, and was thenceforth progressive.

In addition to the change of color the hair has become thicker and coarser than formerly, and while previously dry, is now quite oily.

The hair on other parts of the body is also changed in color.

The eyes have become a much darker blue.

In the second case, the Pilocarpin was administered to an infant fourteen months of age, afflicted with Membraneous Croup. (See Phila. *Medical Times*, August 13, 1881.)

The treatment was commenced June 19, 1881; two milligrams of hydro-chlorate of Pilocarpin being given every hour, afterwards increased to four milligrams every hour. It was administered for nine days, the amount being diminished towards the last.

The first specimen of hair was taken June 17, 1881, and the second June 27, 1881.

The color of the first is light yellow, and the second is a decided shade darker. This effect, of changing the color of the hair, if subsequent experience shall confirm it, adds another to the marvellous influences of Jaborandi on the human system.

The *modus operandi* of the change is still to be determined. It is probably connected with the fact that Jaborandi stimulates the nutrition of the hair.

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* Read before the A. A. A. S., Cincinnati, 1881.