posits, known as the "solid soda," consists of a mass of crystals mixed with a considerable amount of black slime. Analysis shows: $Na_2 SO_4$, 36 per cent; $Ca SO_4$, 1.45 per cent; $Mg Cl_2$, 0.77 per cent; $Na Cl$, 0.21 per cent; $H_2 O$, 46.87 per cent; insoluble residue, 13.86 per cent. The upper part of the deposit from 3–12 inches thick is formed by solution from the upper layers of the lower part, and by subsequent evaporation or cooling of the solution. Calculated as anhydrous, the composition of this upper portion is: $Na_2 SO_4$, 99.73 per cent; $Mg Cl_2$, 0.26 per cent; insoluble matter, trace. The article, however, as prepared at Laramie is said to be not so pure.

Artificial Pyroxenes, Etc.

A contribution to the artificial production of minerals in a general method for the production of anhydrous crystallized silicates is described by Dr. Hermann Traube. The amorphous hydrated silicate is precipitated from a solution of the salt of the metal by the addition of a solution of sodium silicate. The precipitate is heated to a high temperature for several hours with boric acid, and the anhydrous silicate is finally obtained in good crystals. Ebelmen has already prepared the mineral pyroxene by this method, but Dr. Traube extends its application to any of the corresponding metallic salts. For instance, beautiful crystals of zinc bi-silicate, $Zn Si O_3$, are obtained by precipitating the hydrous silicate from a solution of $Zn SO_4$ by addition of sodium silicate. The precipitate is ignited with eight times its weight of fused boric acid and finally the boric acid not volatilized is leached out with water. The crystals of $Zn SiO_3$ occur as transparent prisms with domal terminations. By the same method the mixed silicates of this class may be obtained.

Stereochemistry and Motochemistry.

In view of the recent extended study awarded this comparatively new field in chemistry, historical notes of its earlier conception become of interest. In addition to the hints regarding geometrical arrangement in space offered by Swedenborg, Wenzel, Biot, and some others, we have the same ideas foreshadowed in the writings of Wollaston and Ampère—quoted by Prof. John C. Cain, of Owens College, Manchester, in a recent letter to *Nature*. Wollaston in his paper entitled, "On Super-acid and Sub-acid Salts" (Phil. Trans., Vol. XCVIII, 1808) discusses the constitution of the two oxalates of potash: "When our views are sufficiently extended to enable us to reason with precision concerning the proportions of elementary atoms, we shall find the arithmetical relation alone will not be sufficient to explain their mutual action, and that we shall be obliged to acquire a geometrical conception of their relative arrangement in all the three dimensions of solid extension . . . When the number of one set of particles (combined with one particle) exceeds in the proportion of four to one, then, on the contrary, a stable equilibrium may again take place if the four particles are situated at the angles of the four equilateral triangles composing a regular tetrahedron... It is perhaps too much to hope that the geometrical arrangement of primary particles will ever be perfectly known."

The same idea was developed later by Ampère in his "Letter to Berthollet" (1814), in which he considers the molecules as forming various geometrical figures dependent on the number of atoms contained therein.

Under the designation "Motochemistry" M. E. Molinari has recently discussed the hypothesis that the constitution of compounds is dependent on the intromolecular movements of the atoms in relation to one another, rather than on their relative positions in space. The bonds by which it is customary to represent the union of atoms are taken as expressing the nature of the swing or energy of the atoms with regard to each other.

CONTINENTAL PHENOMENA ILLUSTRATED BY RIPPLE MARKS.

BY RICHARD E. DODGE, CAMBRIDGE, MASS.

A few days ago I saw at Winthrop Beach, Mass., some peculiar features of ripple marks that I thought might be of interest to the readers of *Science*.

Walking along the beach close to low-water mark, I noticed from a considerable distance a large number of peculiar markings upon the surface of the ripple marks, with which the shore was extensively corrugated. The sand of which the ripple marks were composed was very micaceous and much mixed with fine mud, so that it held a large amount of water between the particles. There was also a thin film of water on the surface of the deposits, partially held in position, I suppose, by cohesion. The ripple marks had an amplitude of about eighteen inches, and in the hollows between two adjacent marks the film of water was somewhat thicker than on the sides, so that a shallow basin was thus formed, bearing the same relation to the sloping sides of the ripple marks that the ocean itself bears to the adjacent continents.

After having noted the conditions mentioned above, I saw that the peculiar markings were due to the erosion caused by the water running down the sides of the ripple marks toward the hollows. The seaward sides of the marks were being worn away and dissected by a small river system developed thereon, and the waste thus derived was being deposited in the adjacent hollows. We have thus in these ripple marks, left uncovered by the receding tide, constructional forms similar to what we might expect to see when a warped coastal plain emerges from beneath the ocean.

As we would normally expect on such a constructional surface, we had developed at once a drainage consequent on the slope and structure of the materials of which the slope was composed. The streams, small as they were, followed all the laws of the largest continental streams, at once deepening mouthwards and lengthening headwards toward the divide formed by the crest of the ripple marks. Such small river systems were developed at frequent intervals along the slope of the ripple mark, each one having numerous tributaries and assuming a digitate form so familiar in rivers.

As soon as the small stream reached the level of the half-inch film of water in the basin between the ripple marks, erosion ceased and deposition began. In front of each small stream there was building out into the basin a small delta, but very broad and as deep as was the layer of water. The discharge of the minute fragments of waste from the streams was so rapid that I could watch the growth of the delta with ease and could note the building forward of the frontal slope and the building up of the top slope to the surface of the water, as has been described by Prof. W. M. Davis in his description of the growth of glacial sand plains. We thus had forming a small continental shelf similar to that off the eastern coast of the United States at the present time.

A more careful study of the processes in operation in these basins showed me that at certain places the small streams were developing alluvial terraces and at others building alluvial plains according to whether the stream was over or under-loaded with waste to be carried down the slope. At one place I found that the crest of a ripple mark was cut by a small transverse channel draining the basin above the mark into the one below. Such a small channel must have been formed by an antecedent stream, that is, one in operation and maintaining its course across the rising fold as it emerged from the ocean. Such a river is the Green River described by Powell.

In a word we seem to have in these small ripple mark basins that I have described an epitome of the destruction of continents, of the formation of the continental shelf and the evolution of geographic form as brought about by subaerial denudation. The erosive work was particularly similar to that of an ordinary river because the water running down the slope was very slight in amount. The rills were not formed, as are ordinary rills, by the flowing back to the ocean of the water held in a considerable hollow of the beach. They were formed by the small amount of water held in the spongy material of the ripple marks and pulled down toward the hollows as the level of the water under the surface lowered with the receding tide. The amount of water thus being less than usual in the formation of rill marks, the process was slower and the result more delicate and more similar to ordinary subaerial erosion.

In was interesting to note that the erosion took place only on the seaward side of the ripple marks and the shoreward sides were left undissected. The reason for this seems to be that the water held in the sands was pulled vertically down by gravitative action and hence was drawn through between the particles of the beach deposit toward the next hollow on the seaward side. In this respect only, as far as I could see, did these small streams differ from the streams on a similar constructional slope in the more consolidated rocks of the continents.

It would seem from this instance and others that have been called to my attention from time to time that nowhere do we have such a chance to study dynamical geology in operation on a small scale as at the sea shore. Apart from the work of the ocean itself there are a large number of things similar to what I have mentioned above that are worthy of careful attention, even though they be small. One thing especially that can be studied to great profit at this time of the year is the shore work of frost and ice. I feel that our ocean shores have not been studied in sufficient detail in the past, and I am sure that no better place can be found to show erosive processes in their entirety than the sea shore at low tide.

LETTERS TO THE EDITOR.

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

Another Rope of Maggots.

The note by Mr. Lynds Jones in *Science* of December 29 recalls a similar observation by myself. I was hastening to a train and observed a rope of maggots, such as is described by Mr. Jones, crossing my path, which I at first took to be the skin of a snake. It was on what is called the Gully Road in Newark, N. J., and the maggots were crossing the path from the gully of the road. I kicked it and noticed that the maggots appeared to be clinging to each other, so that they separated in flakes. I had not time to look, but I presumed that they were moving away from a carcass which had been exhausted. A year later along the same road I noticed in the gully the body of a dog which was being consumed by maggots, but I observed, when the food was exhausted, that they moved down the rocky gully not in a rope, but one by one, and scattered along, slender and emaciated, for a distance of perhaps fifty feet. William Hayes Ward.

New York, Jan. 12, 1894.

Secret Language of Children.

Mr. Oscar Chrisman's article in *Science* of Dec. 1, 1893, recalls to my mind the "Hog Latin" that I and my school-boy companions used to use, and by means of which we were able to carry on conversations which were altogether unintelligible to our parents and teachers.

Our "Hog Latin" was formed by transferring the first consonant sound of a word to the end of the word, and then adding long *a*, as in the words doubt = oubt-da, book = ook-ba, house = ouse-ha.

Long words were sometimes split up into syllables, and these syllables treated as shorter words, as: Language = angla-agegwa, suspect = us-sa-ect-spa. This language was defective in that it did not sufficiently disguise those words which begin with a vowel, as: Are = are-a, either = either-a, any = any-a. We used to get around that by avoiding the word I; using *me* instead, or by placing the accent in the wrong place, as: Either-a, calling it *ee*-thra.

I remember that I learned to use the language in a day or two, and after a short time did not have to stop to think how to make a new word, but was guided by the sound entirely.

A couple of sentences will suffice to explain the language:

Where are you going this morning? *Ere-wha are-a oo-ya oing-ga is-tha orning-ma?*

When this language is spoken rapidly it is difficult for those not in the secret to catch what is said. *En-wha is-tha ang-la-edge-gwa is-a oken-spa apid-ra-e-la it-a is-a iffi-da-ult-ca or-fa ose-tha ot-na in-a e-tha e-sa-et-cra oo-ta atch-ca ot-wha is-a ed-sa.* D. T. Marshall.

Metuchen, N. J.

Notes on Water Lilies, Etc.

J. E. Todd in *Science*, No. 567, mentions a "miniature water lily." Another variety of a very small water lily grows at Hyannis Port, Mass., in a long abandoned mill pond. None other of the numerous ponds in that locality, where water lilies grow abundantly, possesses this small and beautiful variety. The blossom is an exact copy of *Nymphea odorata*, and is but one-half inch in diameter; the leaves also, in shape, color and venation, are like those of *N. odorata*, and are but one and a half inch in full diameter. I did not look up the plant last summer, but had found it for several years before, and will search for it when I return to the shore.

Several notes on "coon-cats," etc., recalled to me a very large black and white tom cat, at Hyannis Port, a notable mouser, having the peculiarity of *double fore feet.* All the feet of this animal are particularly large and strong, and on the outer side of each fore foot grows a second paw more than half as large as the normal one. This cat was a vigorous digger; to effect entrance to a basement under my porch, he dug a large hole at an angle of 45° and about eighteen inches deep, passing under the boarding, and large enough for him to crawl