the committee to study them. But he calls for more evidence that the Killarnean, of which he doubts the Keweenawan age because it is cut by a swarm of Keweenawan dikes, is other than the Algoman.

At Killarney it is, I found (in an unpublished report of a trip I made with Ellsworth for the Canadian Survey before Lawson visited the region), associated with porphyries, as Lawson later pointed out. I did not find it at Killarney cut by diabase dikes. There are porphyrites north of it which I think are Keweenawan, but they do not seem to cut, but to conform in strike. I wish we could visit the region together. Even if it were cut by such dikes they would not show that it was not Keweenawan. I remember looking over some drill cores of the Onondago Copper Company in the Porcupine Mountain region (Hole 7 see 4–49–42 at 1,408 feet) close to Keweenaw Point and being surprised to find a basalt dike cutting the Keweenaw rocks. F. E. Wright and I found another intrusion in the Chippewa felsite which is the core.

The latest Keweenawan for which Urry has yet given age data is, I think, the north and south dike of the Horne mine (Noranda). This is the kind of dike to which Lawson refers. It is 510 ± 25 million years old. On the other hand, a normal dike of the Gogebic range is 560. But this dike is cut and displaced by a sill and may, as L. M. Scofield, S. Royce and others suggest, be very late Huronian (Animikie, neo-Huronian). The ages of the flows of the mines of Keweenaw Point vary from 550 (Champion) to 520 (Atlantic) million years old. These dates cover at least two periods of wide-spread felsites and disturbances (not to mention the valuable suggestions of Broderick just made in "Economic Geology")—(1) Conglomerate 8 and the felsites of Mount Houghton and (2) Conglomerate 16 and the Chippewa felsite of Porcupine Mountain. But the Lake Shore traps are later with thousands of feet of strata separating and might be of the age of the Horne dike. In this letter I can not try to enter into the connections with the Duluth gabbro invasion and disturbances of late Keweenaw age studied by H. R. Aldrich and the Embarrass and the Presque Isle granites to which I referred (*American Journal of Science,* 1917, pages 42 to 48) nor the Republic (Lamey) and the Mellon (Richarz), more recently studied. Obviously there is time in the Keweenaw for various dates of granite intrusions. As Killarnean may have been included granites of substantially different ages which might yet all be Keweenawan.

But I agree with Lawson that these granites lap closely on the base of the Paleozoic, the top of the Upper Cambrian (the kolm), having been formed about 400 million years ago. Indeed I am inclined to consider some Cambrian. Lawson has suggested[1] that the Algoman is some 218 million years earlier than the Keweenaw and Animikie, separated long enough for its profound peneplanation. Not to go beyond North America into Norway and Africa, there are such earlier granites. We may instance that represented by the Besner uranite, of which we have 3 or 4 lead ratios and an atomic weight, and the age is not far from 800 million years.

I imagine this and similar granites cutting only part of the Huronian would be Lawson's Algoman, for these are distinctly younger than another group of granites cutting the Grenville limestone, which are the original Laurentian granites represented by Wilberforce, Pied des Monts, Villeneuve, etc., about a thousand million years old. Out West there seem to be granites much older, Kewatin and pre-Kewatin, not yet distinctly recognized in Eastern Canada.

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THE MELODIES OF VERSE

POETIC melodies tend, in good reading, to arrange themselves in patterns which coincide with the phrase or the line, and these patterns are often repetitive. Melody, furthermore, often emphasizes the poetic rhythm and the stanzaic structure, and prepares a sort of cadential effect for the end of a passage. These characteristics, often suspected, have been proved by phonophotographic researches into the nature of verse, which are being conducted this year under the auspices of the American Council of Learned Societies. The researches have revealed also a third characteristic: riming words tend to be pronounced on the same pitch.

The tendency of two riming words to be pronounced on the same pitch was noticed in an excellent reading by a distinguished American poet of a poem by Herrick. The mean frequencies of the riming words were as follows:

Word	*Mean frequency, d.v.s.*
eyes	235
skies	230
see	275
free	268
hair	250
air	248
wear	225
ear	232
stone	178
gone	172

This was all the more remarkable because the reader's pitch range for this poem was an octave and one half, and in one instance he had to jump seven tones in order to make his rimes correspond in pitch.

[1] *Bull. Geol. Soc. Am.,* 1934, p. 1069.

We sought to verify this observation by asking a young Englishman, a graduate of Cambridge and the author of several books of verse, to read the same poem twice, at an interval of about one hour. In order to see whether the characteristic might be individual to the poem, we asked a young woman from Oregon and a young man from Louisiana to read very different poems into our recording apparatus. When we were through we had phonelescopic pitch-records of samples of verse from three centuries, which had been read by competent people as far removed as England and Oregon. In all these cases the greatest difference observed in the pitches of any pair of rimed words was 17 d.v.s. (which, in that register, represented about one half tone), and the average difference was 5 d.v.s., or about 2.5 per cent. It was also noticed that pitch-patterns of riming words tend to be similar and that the riming vowel tends to be pronounced on or near a sub-multiple of the characteristic frequency of that vowel.

This characteristic of the melody of verse is now being investigated more fully in the Iowa laboratories. If the results reported in this note are corroborated they may contain a key to the little understood problem of poetic melody.

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EFFECT OF CORTIN ON INTRA-OCULAR TENSION IN GLAUCOMA

I HAVE found that the heightened intra-ocular tension of simple glaucoma responds with startling promptness to the administration of the adrenal cortex hormone, cortin. In cases which are uncomplicated by degenerative changes of the ocular tissues, even though of long standing, drops of pressure from levels as high as 50 mm of mercury (Schiotz) to normal level have been noted in the period of half an hour, after injection of cortin. Parallel to this drop in tension, there occurs a rise in visual acuity, often to normal level, and relief from the sense of tension and pain.

These findings throw a new light on the mechanism of the rapid changes of intra-ocular tension in glaucoma, and enables a better comprehension of the puzzling features of the symptomatology of the disease. For the work of Swingle, Pfiffner and others has shown that deficiency of cortin results in increased permeability of the capillaries and vessels to the water and mineral content of the plasm. Rapid increase in secretion of fluid into a densely encapsulated organ such as the eye would result in a rapid rise of the tension. In the same manner can be explained the response to cortin therapy of deafness associated with increased intra-ocular tension and Meniere's syndrome.

Response of progressive myopia to cortin therapy leads to the hypothesis that the mechanism of this disorder is similar to that of glaucoma, a disturbance of the water-salt metabolism. The difference in the end-result is explainable in terms of elasticity of the tissues of the eye; the more elastic sclera of the younger eye yielding and stretching into the myopic state, and the less elastic sclera of the older eye forcing a giving-way and compression of the less dense tissues of the parenchyma of the eye, optic nerve disk and ciliary body.

This hypothesis on the nature of myopia is borne out by the finding of a group of cases of progressive myopia in school children which present the symptomatology of glaucoma—headaches, halo formation, cupping of the optic disk and slightly heightened tension. These cases show other signs of endocrine imbalance; in the females among whom the incidence is higher, there are disorders of menstruation. A large mass of data points to correlation of disorders of puberty and sex development and the development of myopia. Evidence at hand indicates the whole series of disorders are fundamentally in the nature of a profound alteration of the water-salt metabolism, and it leads to the belief that sex development may be basically an alteration in the water-salt metabolism or conditioned by it. The administration of cortin to these cases has effected a reduction or arrest of the myopic process and an amelioration of associated symptomatology.

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THE NEW ACTIVE PRINCIPLE OF ERGOT

A RECENT exchange of communications between Dr. Ralph G. Smith, of the University of Michigan, and myself necessitates the correction of an error which appeared in my discussion of this subject in the issue of SCIENCE for June 28. The error has to do with the optical activity of my ergostetrine and the ergotocin of Kharasch and Legault. Instead of claiming that ergotocin (free base) is dextro-rotatory, Kharasch and Legault's claim is that ergotocin *salts* are dextro-rotatory. They did not, as I stated, give the optical activity of the free base. This removes the difference in our observations on this point, since the common salts of my ergostetrine are also dextro-rotatory and, as I stated in my discussion, ergostetrine base and ergotocin base were found to be indistinguishable in exhibiting laevo-rotatory properties. Professor G. L. Jenkins, of this university, confirmed this observation. I regret the error thus made in my discussion. Concerning optical activity and decomposition point of the