

MITROSPIRA, A NEW ORDOVICIAN GASTEROPOD GENUS

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For the past 30 years or more fragmentary specimens of a large gasteropod have been collected and sent in by Geological Survey field parties from Nevada and California. They were found in the Pogonip limestone (Ordovician) of that region. Enough material had accumulated to show that the gasteropod could not be assigned to any known genus, but despite the fact that 30 or 40 specimens were available for study it was not felt that a description of the form was warranted. During the past field season C. R. Longwell, in southern Nevada and the author in central Nevada, made special efforts to collect good specimens of this interesting gasteropod. It is now felt that as good material is at hand as is likely to be found.

The gasteropod which is here described as *Mitrospira longwelli* has a wide distribution in the Great Basin region and is highly characteristic of a fairly narrow zone within the upper portion of the Pogonip. This is of Chazyan age and underlies a fauna closely comparable with zone N of the Chazyan of Canada. Where found the gasteropod is usually present in great numbers. Unfortunately it usually occurs in massive ledges of hard limestone, where thousands of weathered sections may be seen but where it is almost impossible to secure good specimens. The shell of the gasteropod is thick and is replaced by crystalline calcite that shatters badly, leaving only the exfoliated cast of the interior. In thinner-bedded limestones specimens as a rule are imperfect, due to weathering.

MITROSPIRA, new genus

The genus, as here defined, contains the single species *Mitrospira longwelli*, new species. Of this form by careful selection from a large number of specimens enough material has been prepared to show all essential structures in detail. It was found in the preparation of the material that grinding away the matrix was the only satisfactory method.

In order to make clear the following description it should be explained that *Mitrospira* is assumed to have normal dextral coiling. *Mitrospira* seems in fact to be an everted *Maclurites*, the flat lower surface of that genus being produced into a spire. It is tentatively held, therefore, that the spire of *Mitrospira* is the lower and the umbilicated side the upper surface of the shell.

The genus as known is characterized by individuals of large size. The lower side of the shell is produced into a fairly high spire, while the upper side shows a wide umbilicus. The relative height of the spire is variable, due to greater or less overlap of the whorls on those preceding. The umbilicus is wide and open, the tubular cavity extending to the apex of the spire. The upper free margin of the whorls next the umbilicus is subangular. As shown by the growth lines and a fairly perfect aperture, this keel marks the apex of a deep reentrant notch. The keel is then considered the probable equivalent of the notch keel of the typical Pleurotomarids. An interesting feature of the genus is a progressive filling of the living chamber by secondary deposits of lime. This is noted in the description of the species and shows clearly in the section figured. The deposit is closely comparable with the secondary filling of the older camerae of certain cephalopods.

It is here considered probable that *Mitrospira* is a direct derivative of *Maclurites*, having originated as an abrupt saltation. Both in the preceding portion of the Pogonip, of approximately Beekmantown age, and the Chazyan portion *Maclurites* and its congeners are abundant not only in numbers but also in diversity of specific and possibly generic types. No antecedent form to *Mitrospira* has been found, which, though negative evidence, is suggestive. On the other hand, the considerable range in height of spire to be seen in *Mitrospira*, coupled with its essential identity of structure with *Maclurites*, indicates a close genetic relationship with the latter genus. A tendency toward the formation of a spire is shown, so far as known, only on this horizon, except as noted later in the very late Ordovician. In the Pogonip one species of *Maclurites* at times shows a very slight eversion of the whorls, giving a slightly convex outline to the lower surface. It is of interest to note that otherwise no such tendency toward spire formation has been seen on examination of large numbers of *Maclurites* from the Middle and Upper Ordovician, except in the genus *Palliseria*.

The only other known gasteropod with which *Mitrospira* may be compared is *Palliseria* Wilson.¹ This genus is compared with *Maclu-*

¹ Wilson, Alice E., A new genus and a new species of gasteropod from the Upper Ordovician of British Columbia: Canadian Field-Naturalist, vol. 38, No. 8, pp. 150-151, October, 1924.

rina by Wilson but does not seem to be a direct derivative. It seems more probable that it was derived from a *Maclurites* like form by way of some such intermediate stage as *Mitrospira* or belongs to some other genetic line. In section an adult whorl of *Palliseria* has a subquadrate or irregularly polygonal outline, Wilson describing the form as having "six outstanding angles formed by the carinae." Besides differing from *Mitrospira* in the sharply angulated mature whorl, *Palliseria* is easily distinguished by its slightly developed apertural notch. In this connection it is of interest to note two racial groups within the genus *Maclurites* as now defined. In one there is a pronounced apertural notch, and in the other the notch is inconspicuous or wanting. It may well be that two distinct generic types are represented, but as a rule the material available for study does not show the apertural margin or the growth lines clearly, and at present it would be inadvisable to make such a separation. *Palliseria* is found well up in the Upper Ordovician.

Genotype.—The genotype and at present only known species is *Mitrospira longwelli*, new species.

Horizon and locality.—The genus is known in the upper portion of the Pogonip limestone (of Chazyan age) in Nevada and California. Dr. E. O. Ulrich informs me that he has at least two species of *Mitrospira*, one from Canada and another from Oklahoma. The Oklahoma species occurs in the lower part of the Simpson formation. At Phillipsburg, Canada, a species has been collected in beds considered by Ulrich as correlating with the uppermost Beekmantown beds as shown at Fort Cassin, or possibly of even later age.

MITROSPIRA LONGWELLI, new species

This species attains a very large size as compared with most gastropods of equivalent age. An adult individual but not of maximum size has a height of 55 millimeters and a breadth of not less than 80 millimeters. An adult individual has from seven to eight whorls that increase very rapidly in size from the apex to the aperture. In the specimen noted above the whorl at the aperture has a height of approximately 40 millimeters and a maximum breadth of 20 millimeters. The lower side of the shell has typically a broadly expanding subconical profile. The height of the spire is somewhat variable, due to a greater or less amount of overlap of the whorls on those preceding. On Plate 3, Figure 5, is shown the highest spired specimen seen, in which the height and breadth of the specimen are approximately equal. This specimen is an extreme variant and is doubtfully referred to *M. longwelli*.

The whorls, of which there are seven to eight in an average adult specimen, increase rapidly in size with the growth of the animal.

Typically each whorl overlaps the preceding to fully two-thirds its height. By secondary deposits of lime the amount of overlap is made even greater in the older portion of the shell. In section the whorl is an asymmetrically compressed oval with the long axis at an angle of about 45° to the axis of the shell. The inner surface, next the umbilicus, is nearly straight and vertical. At the upper inner shoulder a fairly sharp angular keel is formed. The outline of the whorl in section is well shown in the illustrations.

The surface of the shell when well preserved is marked by fine rounded closely spaced growth lines. The course of these lines can not well be followed in a single specimen, but by using several individuals and a carefully prepared aperture in one specimen it can be worked out in detail. The apertural margin that is figured here was prepared by grinding away the matrix without cutting into the shell. Some of the margin may have been broken away before fossilization, but the aperture as illustrated is, I believe, essentially the true one. It has been carefully checked by other specimens that show the margin in part. Starting at the lower suture the growth line on an adult whorl trends slightly backward and then carries forward in a smooth curve to the periphery of the whorl. Here a forward projected saddle is outlined. The growth line now swings backward in a sweeping curve, which becomes less accentuated in the upper fifth of the whorl as it approaches the angular keel. Passing over the keel the line carries forward a little from the vertical to the inner suture. This gives us a very deep asymmetrical apertural notch with the apex at the keel. These structures may clearly be seen in the illustrations.

The central tubular cavity as noted above extends to the apex of the spire. Each whorl is stepped outward slightly in relation to the one preceding, giving an ever-widening cavity with advancing age. In an adult individual, the outside measurements of which have been given above, the umbilicus has a width in excess of 25 millimeters.

An interesting feature shown by vertical sections is that the whorls were progressively filled with secondary deposits of lime during the life of the animal. In the section figured it will be noted that only the two latest whorls show an inner cavity, the size of which decreases rapidly as one goes backward. The older whorls are solidly filled. Where there is still an opening in the whorl the margin of the cavity shows as a smooth sharply defined wall.

Horizon and localities.—*Mitrospira longwelli* where found and the stratigraphic relationships known occurs in the lower portion of the Chazyan part of the Pogonip limestone. As noted above, it

directly underlies a fauna which seems to correlate closely with zone N of the Chazy section of Canada. Specimens have been collected in the Las Vegas quadrangle, southern Nevada; Inyo and Panamint Ranges, Calif.; and Toyquima, Monitor, and Antelope Ranges of central Nevada.

Types.—The cotypes are in the collections of the United States National Museum No. 80840, 80847, 80848. The specimens from the Las Vegas quadrangle were collected by C. R. Longwell. Those from the Toyquima and Monitor Ranges were collected by Edwin Kirk. Specimen, Figures 1, 2, Plate 1, and Figures 1, 2, Plate 2, specimen, Figure 3, Plate 1, and specimen, Figure 5, Plate 3, were collected in the Las Vegas quadrangle, Nevada, by Prof. C. R. Longwell. The exact locality is "Summit on Alamo road south of Sheep Playa. Outcrops just west of summit." Specimen, Figure 4, Plate 3, was collected by Edwin Kirk on the east front of the Toyquima (Toiquima) Range, Nev., near the mouth of a canyon variously known as Ike's or McMonigle's. This is in the Lowry Peak quadrangle. Specimen, Figures 1, 2, 3, Plate 3, was collected by Edwin Kirk on the east front of the Monitor Range facing Antelope Valley about 5 miles south of the mouth of Ryegrass Canyon, Lowry Peak quadrangle, Nevada.

EXPLANATION OF PLATES

PLATE 1

Mitrospira longwelli, new genus and species

FIGURE 1. Lateral view of large specimen. The growth lines to the right near the aperture are abnormally developed and probably indicate a gerontic individual. The apparent angulation at the periphery of the last whorl is due to weathering.

2. Lateral apertural view of same specimen.

3. Vertical section. The apex of the spire has been removed by weathering. Note the progressive filling of the living chamber by secondary deposits of lime. The interruption in the last whorl, to the left, is due to the fact that the section cuts through the apertural notch.

PLATE 2

Mitrospira longwelli, new genus and species

FIGURE 1. Upper view of same specimen shown in Plate 1, Figures 1, 2, showing the wide umbilicus.

2. Lower, apical view of same specimen.

PLATE 3

Mitrospira longwelli, new genus and species

- FIGURES 1, 2, 3. Various views of the aperture. Figure 1, looking directly into the aperture. Figure 2, lateral view showing the sinuous outline of the outer margin of the aperture and the pronounced retral swing to the notch keel. Figure 3, the aperture as viewed from the upper (umbilicated) side.
4. View of specimen with the earlier whorls fairly well preserved, showing the apex of the spire and the ornamentation. The outer whorl of the specimen has been blocked out, giving the outer whorl as shown not its true width but the width visible when overlapped by the later whorl.
 5. Lateral view of badly exfoliated specimen, doubtfully referred to this species. The specimen shows the most extreme relative height of spire seen.

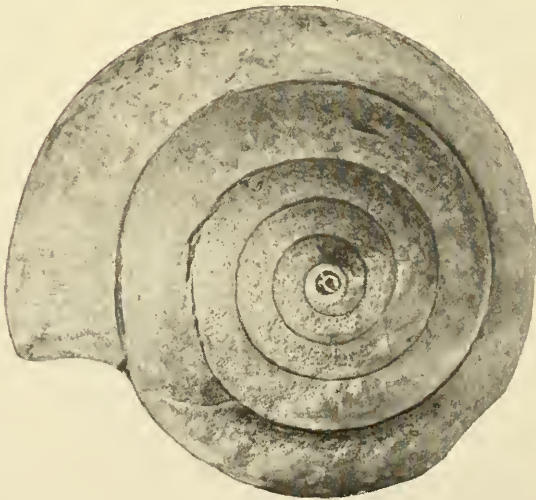


MITROSPIRA LONGWELLI, NEW GENUS AND SPECIES

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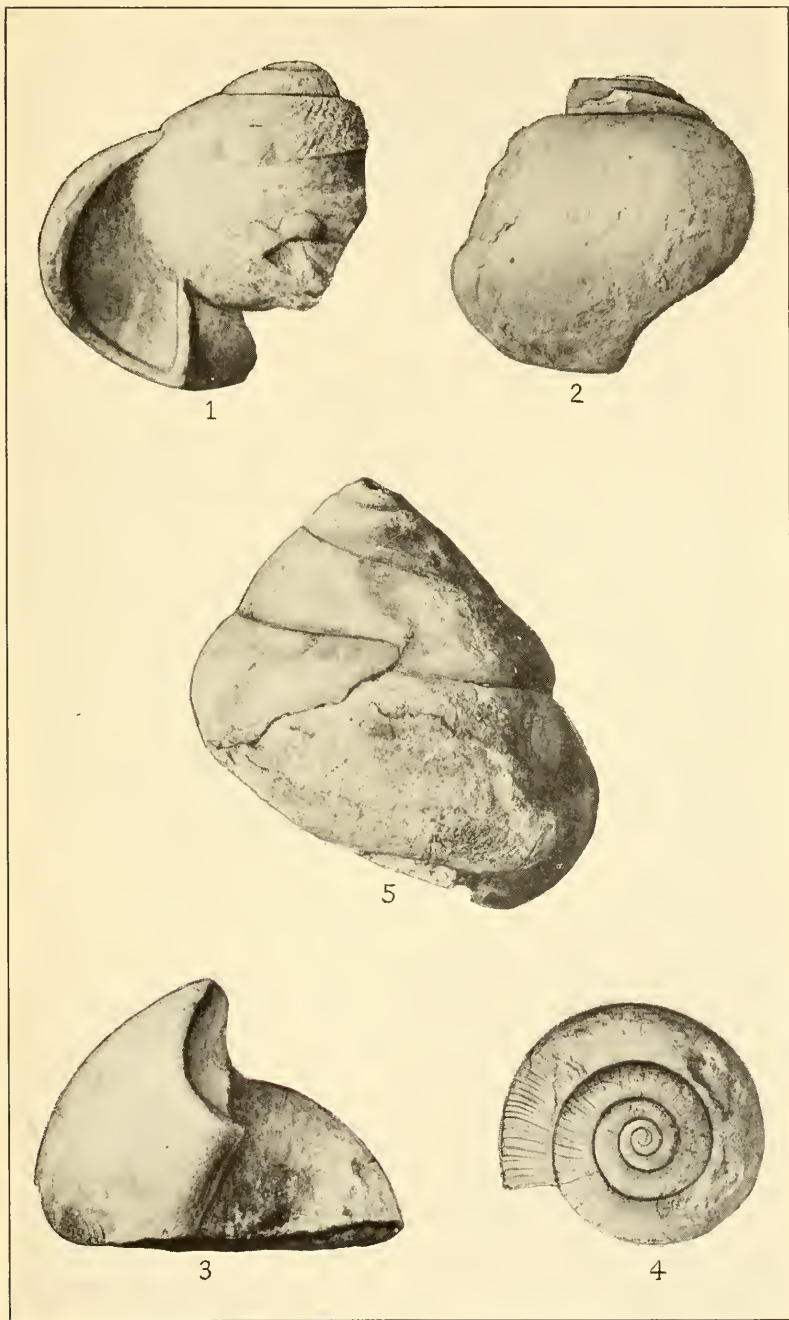
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MITROSPIRA LONGWELLI, NEW GENUS AND SPECIES

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