

the field may have taken certain strata of the sequence to belong to one or the other of the two rock systems in question, this has no meaning unless their opinion was based on careful laboratory studies. Because of these problems of identification, Waisgerber's opinion that there is an interfingering of Cambrian strata with the Mississippian at this site appears to have no real basis.

2. The other major argument which Waisgerber et al. use for defending their hypothesis that there is no real unconformity between the Mississippian and Cambrian systems in the Grand Canyon is their failure to locate any preserved erosional features at the North Kaibab Trail site. According to the information contained within the article, this is the only site at which they made a field study of the contact between the Mississippian and Cambrian. This was a grave mistake in their research, for it is very contrary to the principles of scientific research to make a judgment on the basis of the absence of a geologic feature in one locality when that feature is present in homologous localities nearby. If the authors were to carefully and thoroughly examine every other site in the Canyon where the Mississippian rock system rests on earlier formations, and were to find that there really are no preserved erosional features at any of the sites, then they would have some grounds for concluding that there is at least no erosional unconformity at the base of the Mississippian. But they did not make these examinations, and furthermore, at the close of their article, they made a broad and sweeping conclusion that no appreciable unconformity of any type exists between the Mississippian Redwall Limestone and the Cambrian formations beneath (p. 166). Their "Conclusions" section on this page contains seven items; the first four of the seven read as follows:

1. The unconformity supposedly separating the Redwall Limestone from the underlying Muav Limestone does not exist. Consequently there cannot be any 200 million year hiatus.
2. Since the 200 million year hiatus cannot exist, the dating of Redwall Limestone and Muav Limestone as Mississippian and Cambrian, respectively, cannot be valid.
3. Because the Paleozoic Periods shown above cannot be valid, then the longer time unit known as Paleozoic Era cannot be real.
4. Since Paleozoic Era cannot be a real geologic time unit, historical geologic time must be suspect.

Such conclusions represent an inexcusable error because several thorough geologic research projects have identified several places in the western parts of the Grand Canyon where there are excellent, preserved erosional features lying between the Redwall Limestone and the Cambrian Muav Formation beneath. Ancient, steep-sided erosional channels and solution cavities filled with sediments which were deposited later have been identified both in the Muav Limestone (Shelton, p. 274), and in the Temple Butte Limestone (Devonian) which is found between the Redwall Limestone and the Muav Limestone in some parts of the Canyon--to be discussed below. Waisgerber et al. cite some of the published works which describe these identified erosional features at the base of the Redwall Limestone. The statements which they make on p. 164 concerning the preserved erosional features directly beneath the Redwall Limestone--described by McNaire (1951), McKee and Gutschick (1969), Stoyanow (1948), and Beus (1969)--seem to show that Waisgerber et al. are unwilling to take those research reports seriously. They even quote specific statements from most of these authors stating the types and dimensions of some of the ancient erosional features found; yet they do not offer any explanation or refutation of these features.