July 13 1989

SEM Notes:

In backscatter are spotted monazite; phosphate of the cerium metals, the morphology of the grain very similar to the rest of the clay that it was in.

Mn staining on clay has a botryoidal form

Photo 1 - edge of Mn Staining, w/clay
Clay Si > Fe > Al > K > Mg, botryoids are almost flower like w/ roseHes

Photo 2 clay morphology

Photo 3 edge of a layer to illustrate morphology
"cliff" through center of photo is the edge of a layer

Texturally clay is similar throughout these samples, has a "waxy" look and is (in the mosy part) aligned in plates

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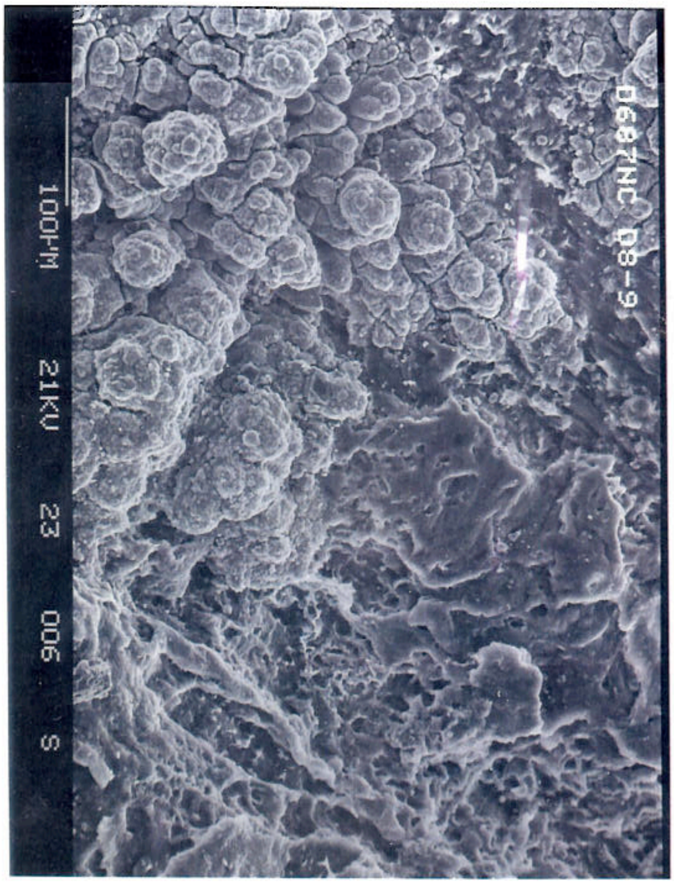
INSERT EMULSION SIDE DOWN

FILE NO:



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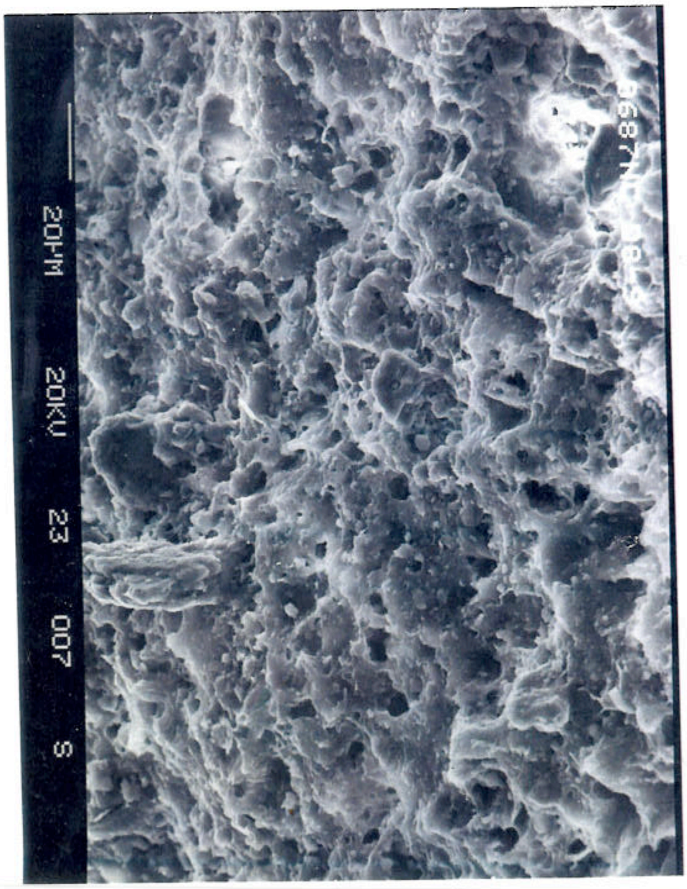

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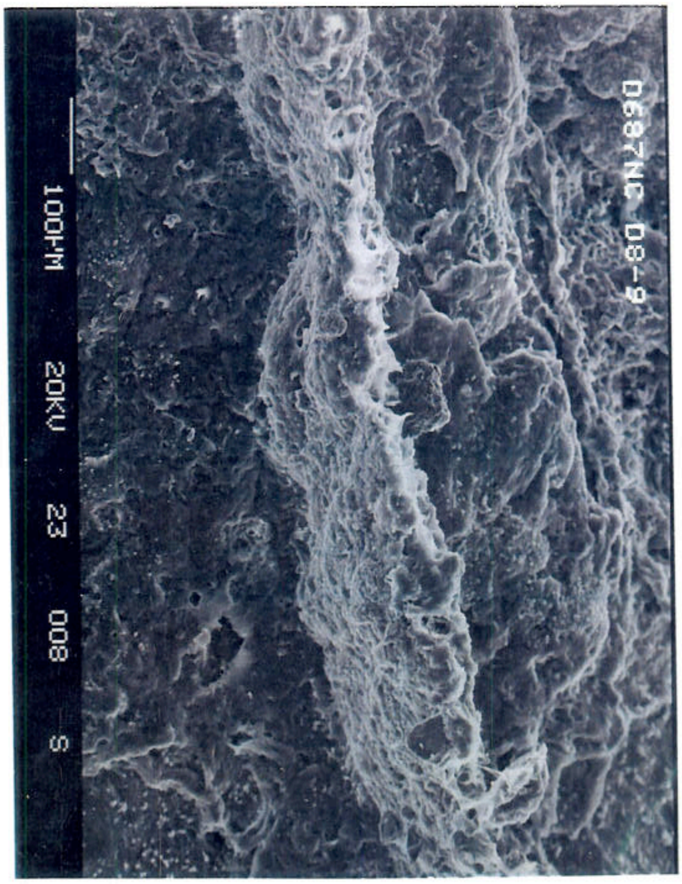


D8-9A
Generally non-manganiferous palygorskite blades.
Some staining on base, but not on blades.

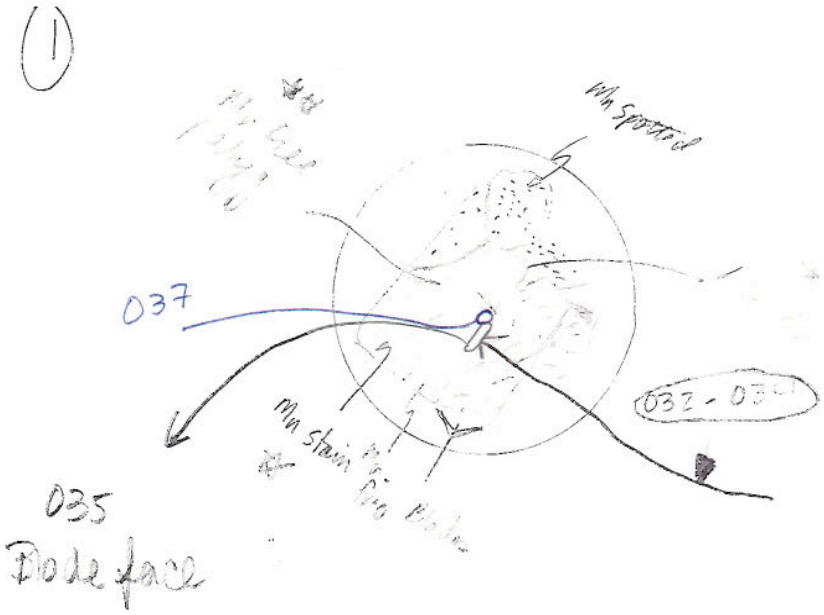


Photo 032

Looking down on edge of blade. Feathery, bladed and sheet morphologies. Si>>Mg~=Al

Photo 033

Looking down on edge of blade. Feathery and matted palygorskite morphologies. Mineralized bacteria in upper right corner. Higher Mg content plus some Fe.

Photo 034

Looking down on edge of blade. Close up of matted palygorskite in photo 033. Si>Mg>Al>Fe. Mineralized bacteria: Si>Mg=Al=Fe

Photo 035 - 036

Outer wall, face of boxwork blade. Massive morphology with included detrital quartz grain. Detrital grains were only identified on blade faces, not in the interior of the blades. Pg: Si>>Al~=Mg>Fe=K

Photo 038

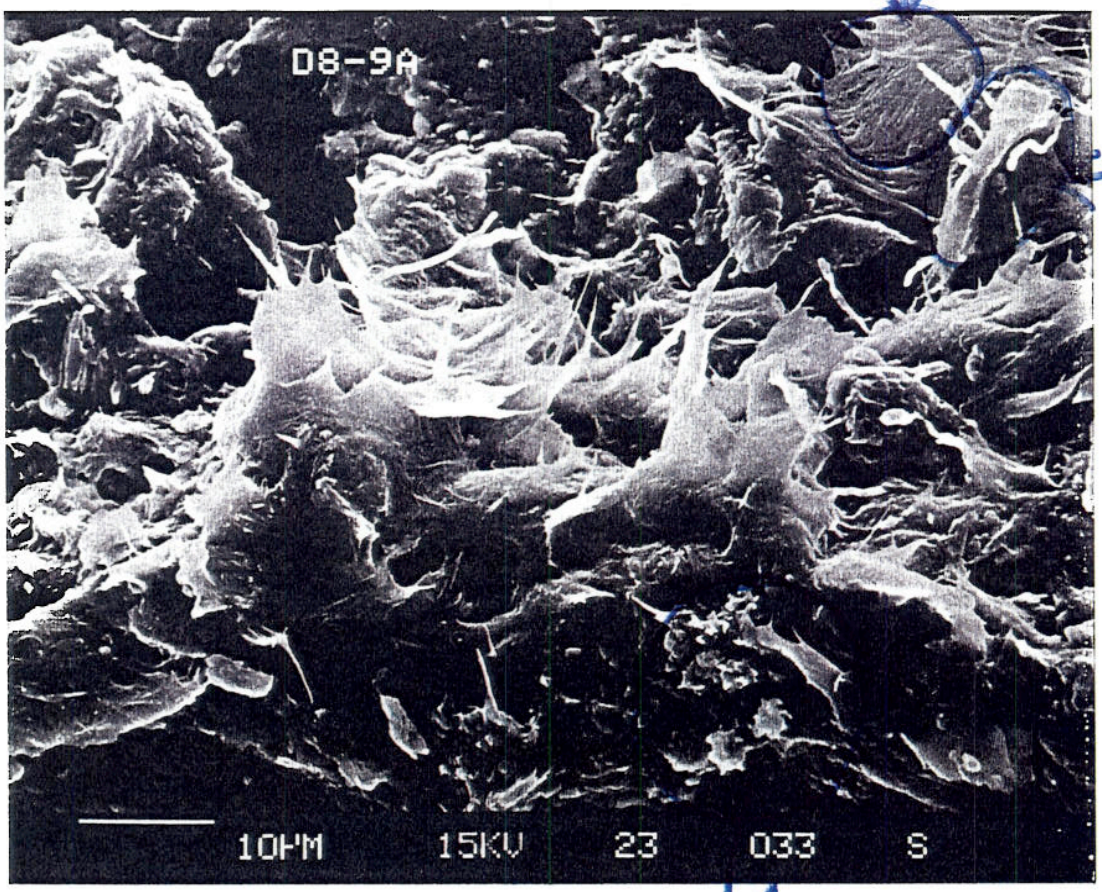
Base of palygorskite, nearly perpendicular to blade. Botryoids of Fe-Mn ramping up onto boxwork blade. Middle of photo shows location where botryoid has broken off palygorskite blade. Si>>Mn>Si>Fe>Mg>>K>Ca>Ti

Photo 039 - 040

Entire sample.

Si > Mg > Al > Fe

034



Mg ≈ Al

D8-9A

033

2

Si > Al > Mg ≈ K > Fe

D8-9B

Black, apparently Fe-Mn coated palygorskite blades.
Bulk chemistry: Si>Mn>Fe>Ni
Fe-Mn seems to be a coating on the side of the blade, botryoids. No distinct form of Fe-Mn on interior of blades. Appears to be a Fe-rich layer between Fe-Mn coating and palygorskite.

Photo 004

Shows Fe-Mn coating with Fe layer in between.
Fe-layer Si>Fe>Mg=Al

Photo 005-006

Middle of blade and close up
Si>Fe>Al>Mg~=K

Photo 007

Three layers. Outer Mn coating, Fe layer and Palygorskite of Fe silicate.

Mn> Fe in outer layer
Fe>Mn in middle layer
Si>Fe>>K>Al>Mg in interior webby material (perhaps not palygorskite?)
Fe>Al~=K>Mg>Mn second analysis of webby material (Could be palygorskite.)

D8-9C

Massive palygorskite, with areas of bladework

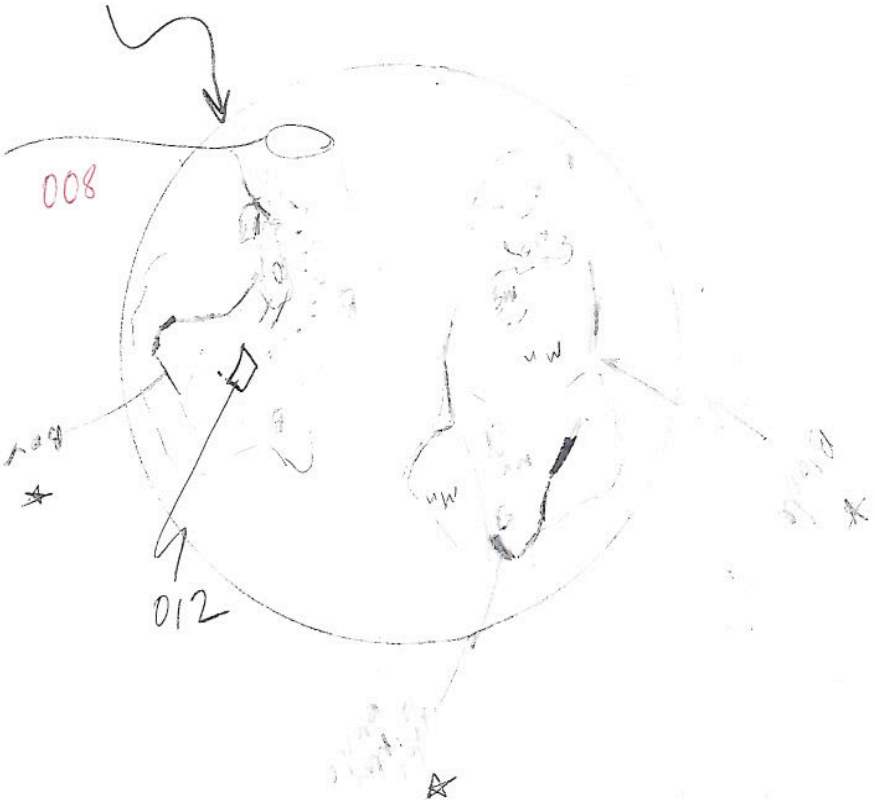


Photo 008

Fe-Mn replacing radiolarian or something. Mn>>Si>Fe>Ca>Al>Mg

Photo 009

Close up of cell structure (008) which has been replaced by Mn.

Photo 010

Close up of mineralized bacteria in lower left of 008. Analysis shows Si>Fe>Mn>Al>Mg=K=Ca, but perhaps not representative.

Photo 011

Close up of bacteria in 010, showing cell structure. Bacteria apparently replaced by Si and Fe. Analysis suggests it is possibly related to Mn phase, but may be background.

not restricted to

Photo 012

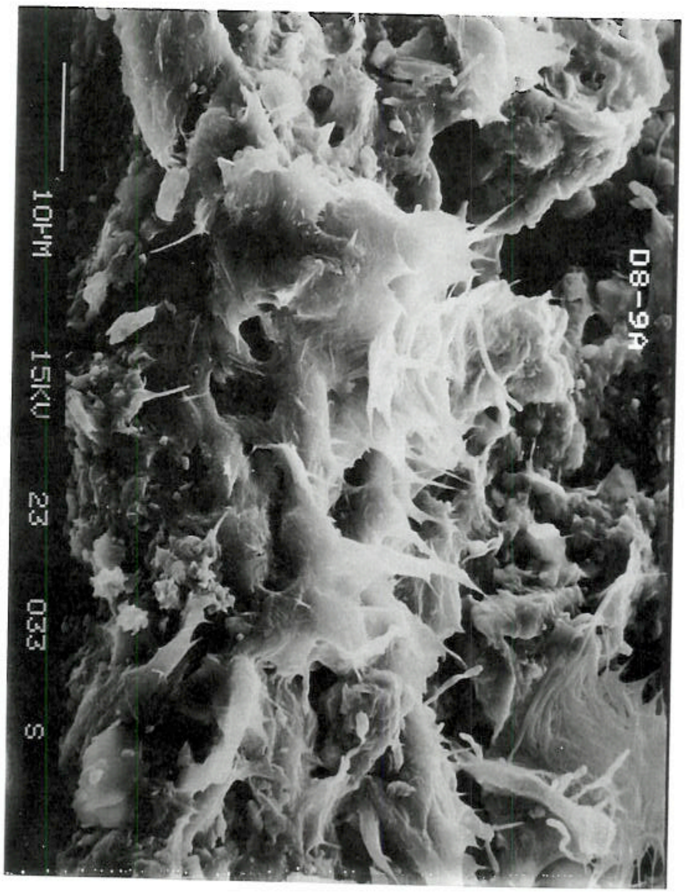
Fe-Mn botryoid growing up through palygorskite. Example of bladed form of palygorskite. On right side of photo, Fe-Mn is over palygorskite. Analysis was difficult, but in this area it seems to progress from Fe-Mn to Fe-silicate to palygorskite in a gradational manner.

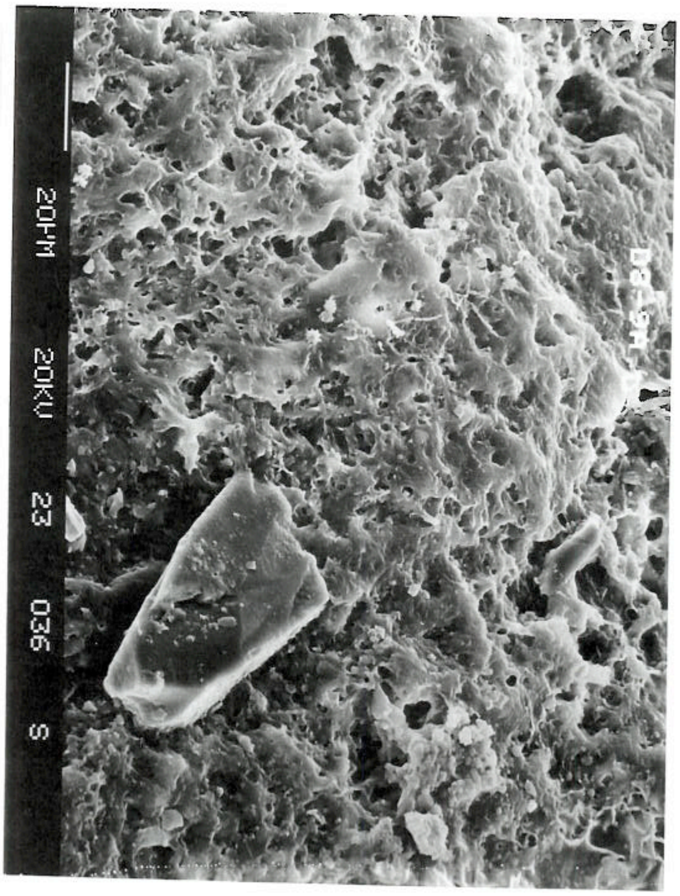
Pg cementing plag, qtz grains

D8-9A 034

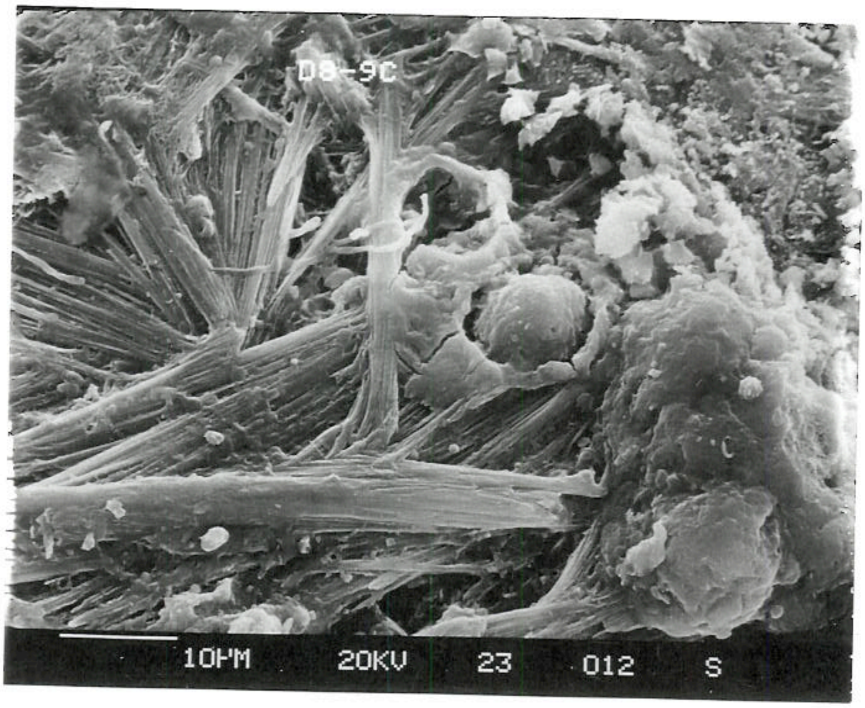
D8-9A 033

D8-9A 036

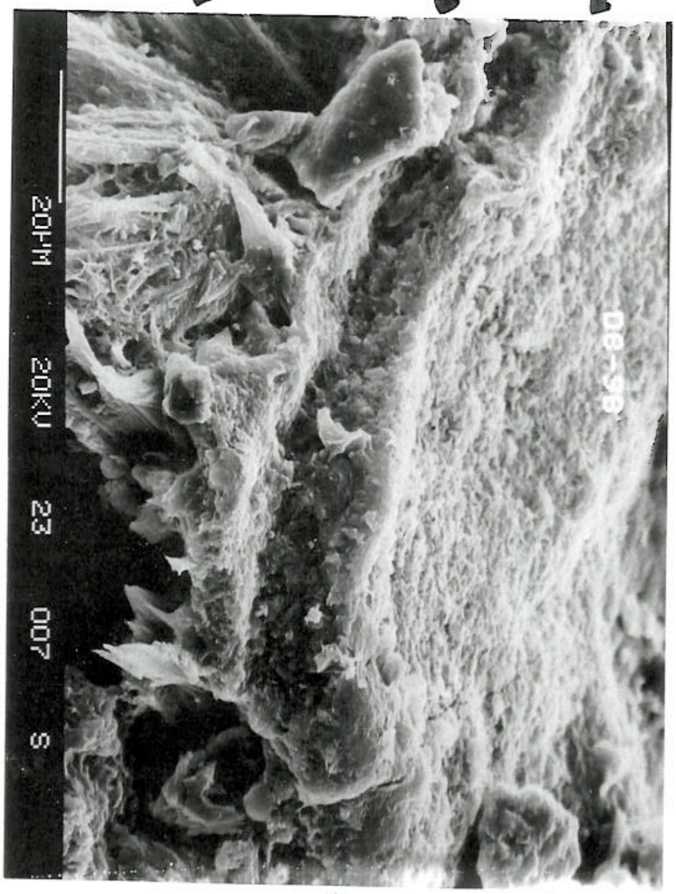




D8-9C 012



D8-9B 007



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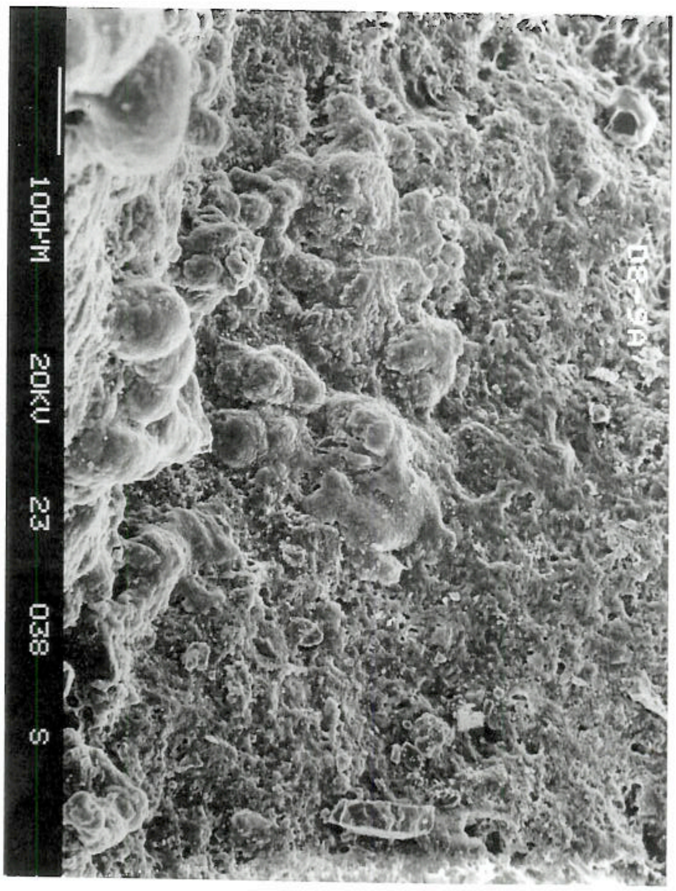

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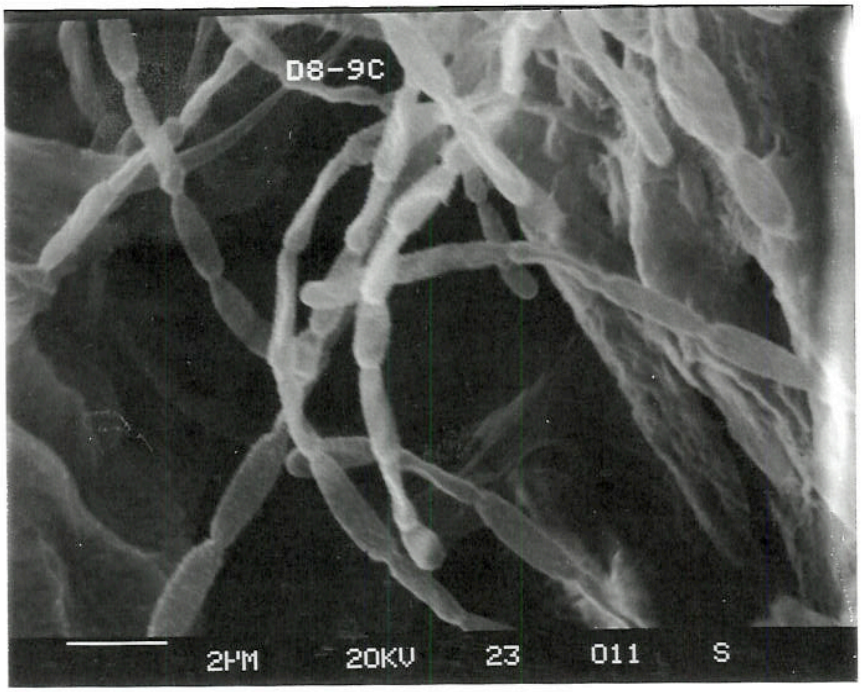

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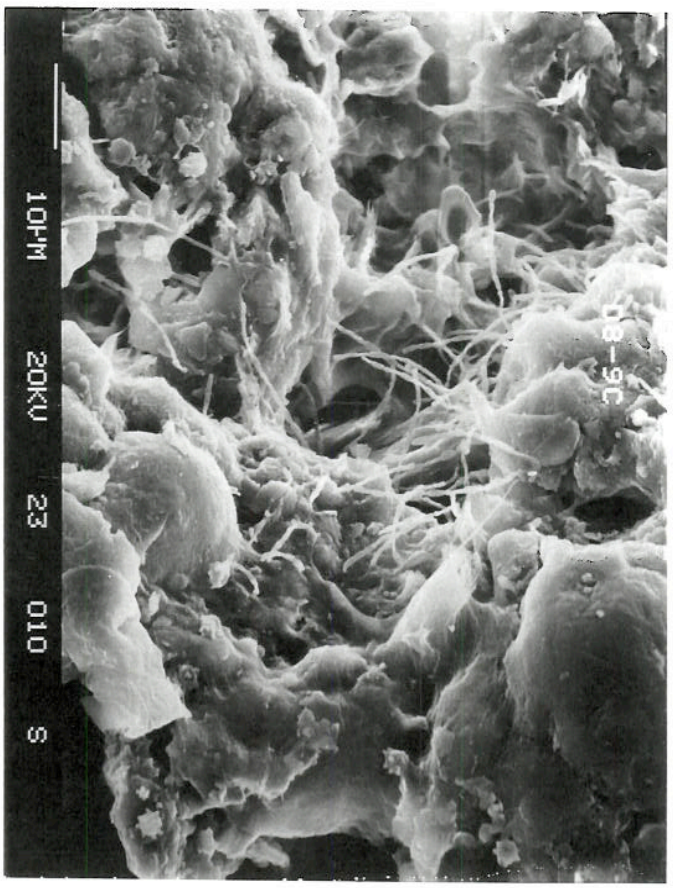

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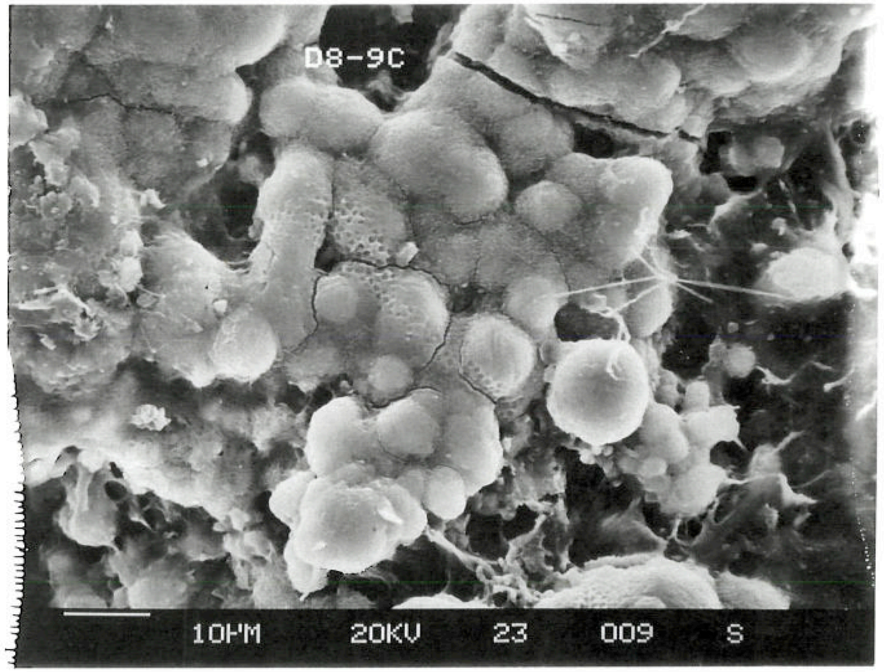

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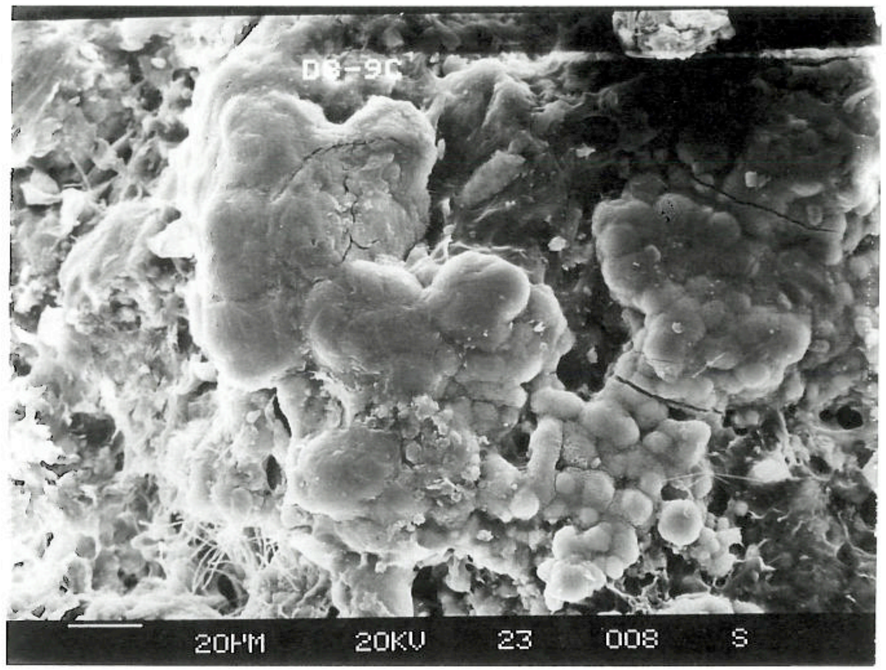

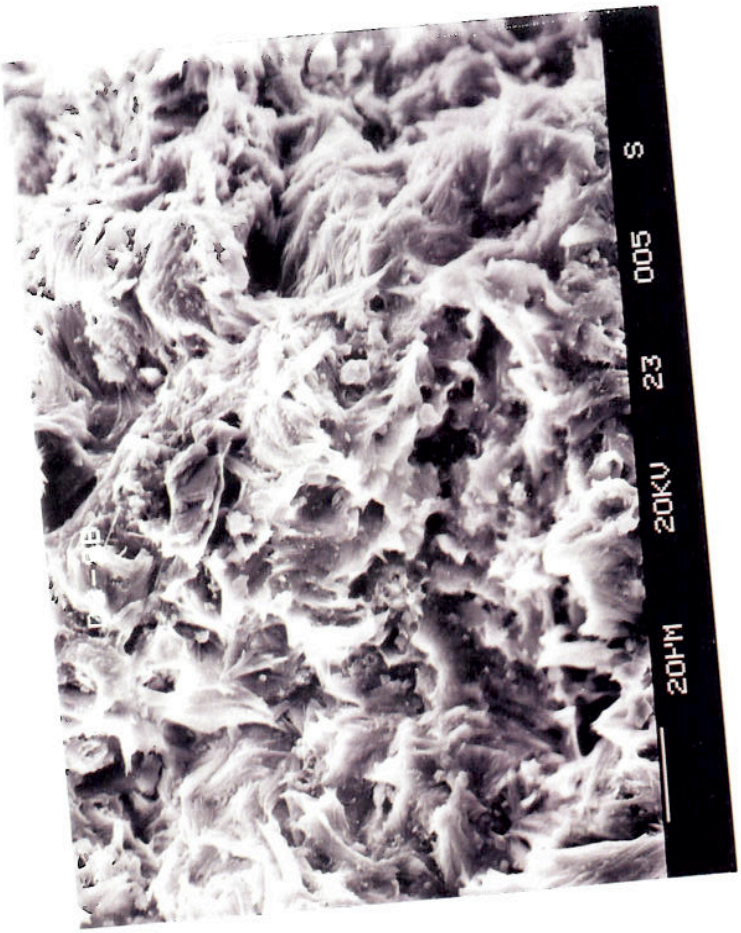

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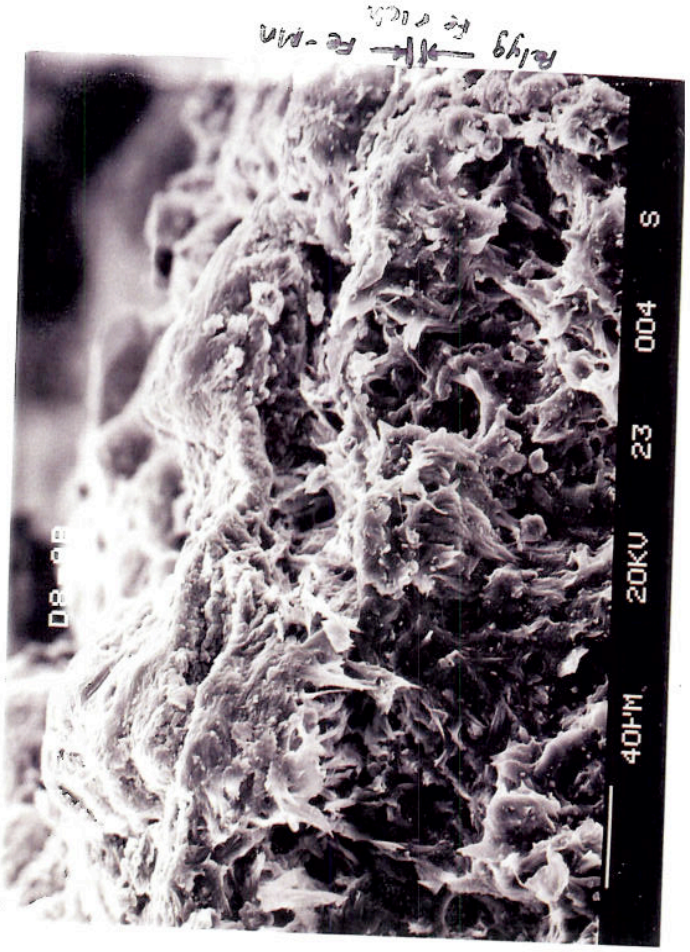

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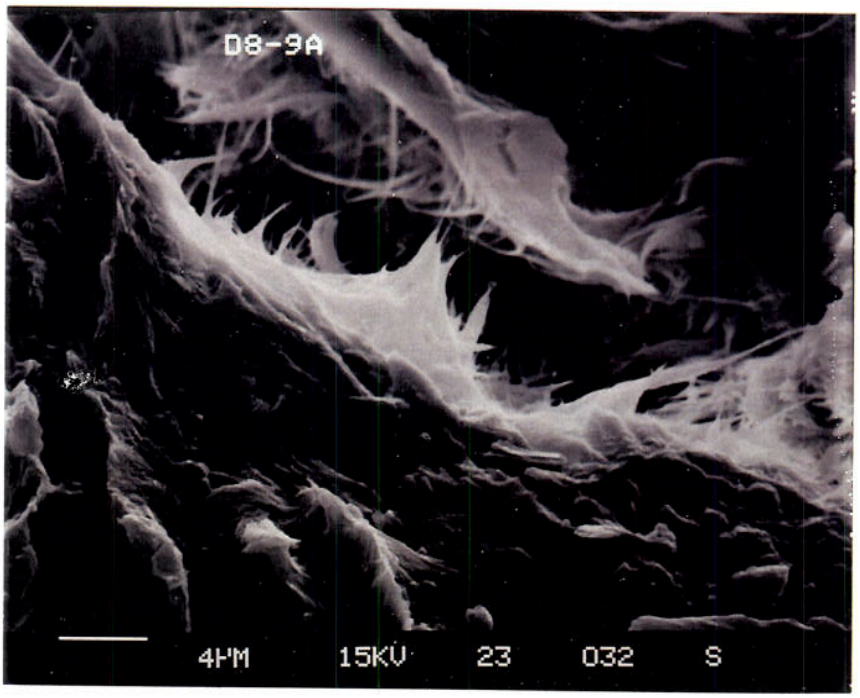
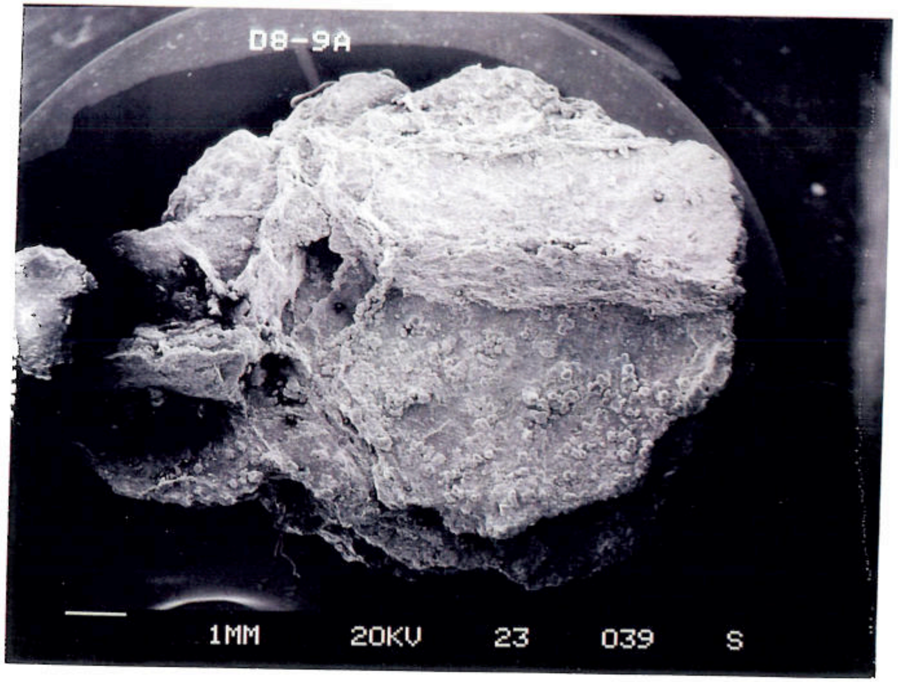


D8-9A 032

D8-9B 006



D8-9A C40