TRIANGLE ASSOCIATION for the SCIENCE of CREATION
P.O. BOX 12051 • RESEARCH TRIANGLE PARK, NC 27709-2051 • tascinfo@earthlink.net
web site: www.tasc-creationscience.org

TASC

TASC's mission is to rebuild and strengthen the foundation of the Christian faith by increasing awareness of the scientific evidence supporting the literal Biblical account of creation and refuting evolution.

Dan Reynolds, PhD, Chairman
Fred L Johnson, PhD, Newsletter Editor
Dale Ulmer, Treasurer

August 2007

IS THERE EVIDENCE FOR THE FLOOD IN THE SOIL?

By Everett Coates

Soil science became a separate scientific discipline in the early twentieth century when geologists first began to think of soils as a natural body distinct from the rocks underneath. These early soil scientists began to classify the soils they found on various landscape positions according to a system they developed as they mapped. Some soils obviously formed in sedimentary material since they occur on stream flood plains or on gently rolling coastal plains. Other soils formed on hilly piedmont and mountain landscapes. The piedmont and mountain soils not on stream floodplains are assumed to have formed in place from the various types of underlying bedrock.

Having received a Bachelor of Science degree in geology in 1975, I held the same assumptions about soil formation in my work as a soil scientist in Wake County, North Carolina. However, after becoming a creationist in 1990, I began to notice the presence of rounded (to varying degrees) quartzite gravel in many soils occurring on hilltop and side slope landscape positions. Quartzite was once sand that was hardened into rock by heat and pressure or by cementation by silica. Note that the gravel was always present in the soil, but I did not "see" it, that is, I did not recognize its significance, until my uniformitarian bias changed. The bedrock underlying the soils in the eastern two thirds of Wake County is igneous or metamorphic (not sedimentary) with no quartzite present. The closest quartzite outcrops are just east of the Appalachian Mountains about 120 miles northwest of Wake County where a layer about one hundred feet thick caps both Pilot Mountain and Hanging Rock.

The problem with finding rounded gravel in upland "residual" soils is the fact that it should not be there. Since round gravel is produced by abrasion during water transport, its presence indicates that at least part of the soil may have formed in material deposited by moving water, not in weathered igneous or metamorphic bedrock. Varying amounts of angular gravel (both quartzite and crystalline quartz) is often mixed with the rounded quartzite gravel (Figure 1). The angular gravel is not visibly weathered while the quartzite gravel is slightly, regardless of its degree of roundedness. The different

Figure 1. Rounded quartzite gravel mixed with angular gravel within residual piedmont soil suggesting abrasion by water transport. Underlying weathered rock is not quartzite.

gravels likely had different sources. The angular gravel's source would be closer to the point of deposition since it is less abraded. It could even have been scoured from local igneous and metamorphic bedrock since it contains quartz veins.

Often the gravel is distributed throughout the entire soil profile although it frequently is concentrated in the topsoil. However, it sometimes occurs as a thin layer or as a distinct bed at the base of the soil lying unconformably above weathered granite, gneiss, or schist. Figure 2 shows a bed of gravel about 2.5 feet thick at the base of the soil overlying weathered gneiss—note a barely visible three inch long red knife placed near the center of the bed for scale. These basal layers, where present, are generally parallel to the ground surface and may be convex in form, indicating deposition on a hilltop. Since streams usually do not deposit gravel and other sediments on hilltops, there must be another explanation.

Some soil scientists in piedmont counties have actually noted the presence of the out-of-place gravel. Of course, their explanation conforms to the evolution group-think of "true science". The gravel is referred to as "let-down". That is, it is the remnant of hundreds of thousands of years of weathering and erosion. It has been "let down" as the underlying rock first slowly turned into soil and

Figure 2. Distinct, thick bed of rounded and angular gravel at the base of upland soil indicating its sedimentary origin. The rectangle and enlargement encloses a three-inch long red knife for scale.

then eroded way. How the pebbles survived the process they do not address. For that matter, no one has ever satisfactorily theorized how soil can form on an actively eroding surface other than to say that the soil is in a state of equilibrium with the landscape. In other words, it erodes as it develops.

These observations caused me to think that the soil may also contain other evidence of sedimentary origin. To test this I collected samples of presumed residual soils from several places in Wake County to analyze for sand mineralogy. Any mineralogical difference would likely be more evident in the sand since it would probably be less weathered than finer particles. Samples were taken from the major soil horizons (or layers of soil having different physical and chemical composition due to soil forming processes) and the presumed weathered rock parent material at several locations around the county. I theorized that if the soil formed in sedimentary material rather than in the bedrock, then grain size, shape, and mineralogy may differ between the soil and rock.

The samples were washed using standard sieves to clean the sand grains of clay and silt and to separate the sand into its coarse (1-0.5 mm), medium (0.5-0.25 mm), fine (0.25-0.1 mm), and very fine (0.1-0.05 mm) fractions. I used a high-magnification light microscope to examine the sand. In the upper soil horizons the sand was approximately 90-95% quartz, with the remainder being dark silicate minerals and muscovite mica. Quartz and dark minerals (mainly amphiboles and pyroxenes) are relatively more resistant to weathering than is mica, due to their crystalline structure. At least that is the standard assumption based on the observation of minerals present in weathered rock and soil since weathering processes cannot be observed. Sand from the "parent material" was dominantly mica with traces of quartz and dark minerals. It is difficult to imagine how a quartz-poor rock could give rise to a quartz-rich soil.

The shape of the grains was equally interesting. The smaller soil sand grains are sharply angular and tend to have an irregular or sometimes needle-like shape resembling shattered glass. This could be the result of a fracturing or crushing action in a high-energy transport environment such as would be expected during the Recessive stage of the Flood. The larger grains have a more spheroidal general form (generally equi-dimensional) but are not rounded, still having sharply angular edges. Quartz grains found in weathered igneous or metamorphic rock usually have a crystalline appearance (more regular, geometrically related surfaces) and tend to have edges that are less angular, showing little evidence of having been fractured or crushed.

The apparent lack of evidence of solution weathering of the crushed quartz grains also led me to think about the age of the soil. If the quartz sand had been exposed to the ground water as it moved downward through the soil over millions of years, it seemed reasonable to expect to see significant amounts of solution pitting of the grain surfaces and reduction of angularity of the points and edges. But there was very little to none. Uniformitarian geologists and soil scientists (and even some creationist geologists) believe that quartz is essentially insoluble in water under conditions found at the earth's surface. In my opinion, it is the assumed great age of the soil combined with the fresh appearance of the crushed quartz sand grains in the soil that has led these scientists to make that assumption.

But through years of soil mapping and agronomic work, soil scientists have recognized the presence of naturally occurring silica-cemented soil horizons that are relatively resistant to water movement and root penetration. Before silica can be precipitated from ground water as cement, it must have first been dissolved by the same water. The only source of the silica in the soil is quartz sand. I was recently informed of a little-known series of experiments conducted in 1960 which demonstrated that crushed quartz sand is, indeed, very water soluble at conditions normally encountered in soil.[1]

[1] Morey GW, Fournier RO, Rowe JJ (1962) The solubility of quartz in water in the temperature interval from 25 to 300 degrees C. *Geochemica et Cosmochimica Acta* **26**:1029-1043

In the experiments, crushed quartz sand was tumbled in distilled water at 25°C for over 350 days at one atmosphere pressure. Water samples were analyzed periodically for dissolved silica content. The sand and water were tumbled at 75 revolutions per minute to remove any dissolved silica from the grain surfaces, thus allowing solution to continue. The scientists determined by microscopic observation that abrasion of the grains was not the source of the silica in solution. Non-crushed crystalline quartz grains are not very soluble. The higher solubility of the crushed grains was due mainly to stresses placed on the crystalline structure by the forces of crushing. The effect of these stresses on solubility may be visualized by thinking about a Tinker Toy structure that is twisted slightly, making it easier for a small section to pop off when pulled. The twisting of the crystal structure when the grains are crushed allows silica molecules to be stripped away by the electrical pull of water molecules. As described above, the quartz sand grains I observed that were taken from the soil appeared to have been crushed. The downward movement of water through the soil would have the same effect in removing dissolved silica from the grain surfaces as the tumbling in the experiment.

While a direct correlation cannot be made between the duration of this experiment and the amount of time required for evidence of weathering to appear on crushed quartz grains in soil, the fact that crushed quartz is highly water soluble in natural conditions has reinforced my opinion that quartz grains exposed to weathering for hundreds of thousands or millions of years should show some significant effects. They do not, at least in the few samples collected to date.

Although my work was not extensive, my observations do indicate that the current assumptions about soil/parent material relationships may be wrong. That is, much "residual" soil may be formed in sedimentary material deposited on top of the bedrock. I have recently collected a number of samples from Yadkin County in the western North Carolina piedmont that I hope to be able to sieve and photograph under a microscope and include in a future report.

My observations have raised several questions. Is it likely that a soil rich in quartz sand could somehow develop from a quartz-deficient parent rock? While hundreds of thousands of years of weathering would account for some mineralogical changes, is it likely that water-soluble quartz would show little or no evidence of weathering? If erosion of the landscape occurred over millions of years, could soil horizons form at the same time? What uniformitarian—"the present is the key to the past"—process could account for the presence of round non-native gravels in soils weathered from bedrock? More research may answer some of these questions.

Rather than being the result of long ages of weathering and erosion processes, residual soils may be the result of a catastrophic Flood. This event would have left clues in the soil for us to observe at least on a regional scale if not global. Evidence of millions of years of weathering, such as briefly described above, should be present in most "residual" piedmont soils wherever they occur, but it does not.

The sediment load being carried by the retreating Flood waters, as well as the force of the water itself, during the early Recessive stage would have helped scour the hard bedrock into the dendritic (branching) topographic pattern visible today. Some of the sediment would then have been deposited as the water's velocity slowed. If floating vegetation mats covered this new surface, erosion would have been immediately minimized or eliminated altogether. This would have allowed soil horizon formation to begin while growing vegetation became established.

The soil is a remarkable system. It is necessary for growing food. It supports our houses. It is a very efficient and environmentally sound filter for wastewater treatment and disposal when used properly. If it is indeed a relic of the Flood, then it also is a reminder of the love of our Creator. For, while overseeing the destruction of the sin-filled world that then was, He left sediments draped over an otherwise jagged and sterile landscape to become soil. In doing so, He showed compassion for the still-sinful descendants of Noah who would one day need it to survive.

COMING EVENTS

August 9, 7:00 P.M., Providence Baptist Church, 6339 Glenwood Ave., Raleigh.

Evolutionary biology holds that all living things are the product of an unguided, random, and purposeless process. Genesis says we were created by God for His glory. At the next TASC meeting, Dan Reynolds, PhD will review a new book by Michael Behe (author of *Darwin's Black Box*) entitled *The Edge of Evolution: The search for the limits of Darwinism*. Behe shows how studies of malaria and the HIV virus in the last decade have allowed us, for the first time, to directly measure the capabilities of Darwinian processes. The data show that Darwinian processes have a limited scope and point to design in nature.

Contributions and requests for newsletter subscriptions may be mailed to:

TASC, P.O. Box 12051, Research Triangle Park, NC 27709-2051

☐ I would like to subscribe to the ***TASC*** newsletter.
(Suggested annual donation is $10 to go to publication costs.)

☐ I appreciate the educational outreach of ***TASC*** and would like to contribute to ongoing and new outreach activities.

☐ $10 ☐ $20 ☐ $50 ☐ Other: $____________

Name____

Address____

City ________________________ State _____ Zip ____________

Telephone ____

Email____