A GEOLOGIST’S POINT OF VIEW ON APPRECIATION OF OUR SURROUNDINGS

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Many a textbook on Elementary Geology opens with a statement relating geology to the other sciences. It seems to me that we can also find some interesting relationships with arts and letters. Perhaps I am prejudiced, but it seems to me that geology is the science which relates best to a great number of other fields. It draws on all the materials of the earth—the very stuff which the sciences study—the ground from which Man and his arts and letters have sprung.

How did Art begin? I don’t pretend to know the answer, but it is not difficult to visualize Primitive Man tracing lines in sand and shaping rough stones; to guess the temptation to mark stones or cavern walls when soft, vivid rocks and minerals were found, such as hematite and limonite—red and yellow ochres—or to use bits of chalk or coal in this same manner. Stonecutters and brickmakers were among the early artisans, taking the materials they had and putting them to use. Others, more skilled and inventive, chipped or carved stones into the beginnings of sculpture, or molded the clay into representations that may have been less useful than brick, but which are an early art. I presume these beginnings of Art antedated the rise of Letters by some time—yet were not these attempts to represent something that had been seen, ancestral to a written language? Picture-writing and other methods of writing on stone and on clay tablets came before the use of papyrus and long before the development of paper.

Even earlier, perhaps, there arose the legends which were handed down by word of mouth for generations before someone wrote them down. And what were these early legends about? How does the Bible begin? You may not consider the story of Creation as geology—but certainly it represents the wondering of mankind about his surroundings—the seeking for an answer to questions that have not yet been solved satisfactorily. We find stories seeking to solve this matter of the Origin of the Earth and of Man among all primitive peoples. It is a thought of foremost importance to all—Where did we come from? How long has there been an Earth? How does it happen to be here, able to support life? And how unique is this situation?
This interest in Man and the Earth has been constant. Yet, with all the search for gold, iron, salt and other mineral products of early importance; with the sailing of seas and mapping of coastal lands; with the selection of road sites and the search for mountain passes—the development of geology as a true science is considered to be relatively recent. It is interesting to note that one of the earliest men to think and write along the lines of modern scientific geology was Leonardo da Vinci—great man in so many fields. It was he who first recognized the true significance of finding marine fossils high above sea level, and insisted that they were evidence of ancient life and that the rocks in which they were found must have been deposited beneath the sea, even though they might now be parts of mountain tops.

How many casual observers of today would reason that way for themselves, if they had not already picked up rudiments of such knowledge? How much more fully they could appreciate some of the things they see, if instructed a little more in the processes at work on the crust and in the interior of the earth!

Most of us today recognize the tremendous value of science to modern civilization. Some feel that perhaps there is too much stress on science and technology as all important—that our sense of values may be lost as too much faith is placed in these false gods. Arts and letters, being older than modern science, have long standing as cultural studies. They, along with religion and philosophy, are the counter-balance against a machine-type civilization. But science is by no means all machines, and in addition to its technical and economic values, it may also have definitely cultural aspects.

From what do we derive pleasure and satisfaction as adults? Partly from hobbies, partly from sports, and to a large extent from what we might call the cultural pursuits—such things as art, music, literature, the theatre, the dance, lectures, travel; often by means of radio, television and motion pictures. Geology may well fit into any of these three categories. Many have made a hobby of collecting and identifying fossils, minerals and rocks—in fact, this is frequently the hobby for a whole family. Thousands of others are especially interested in the cutting and polishing of stones, which may combine an interest in both geology and art, along with technical skill. In sports, there are those who walk for the pleasure of the exercise alone, but how much more interesting hiking can be if done with the viewing and studying of nature, at the same time. One of the most exciting sports is mountain-climbing, which by its very nature demands some study of geologic conditions in advance, and very probably adds a great deal more to the understanding of the climber in the
appearance of rocks and landforms, the action of frost on rocks, the accumulation of talus slopes, and the basic structure of mountains. Travel may or may not be undertaken for cultural and recreational purposes. Even if traveling is done for purely utilitarian reasons, in the course of one's business, the opening of the traveler's eyes to the geological bases of what he sees should make the trip more enjoyable and give him interesting new knowledge.

There are those who pick up these prizes of nature without instruction from others. One of these was Hugh Miller, the English quarryman whose book "The Old Red Sandstone" is considered one of geology's few real contributions to classic literature. His account of his first day at work—of the change from his heavy heart at starting his "life of labour and restraint" to one of wonder and amazement as ancient ripples and mud-cracks were uncovered in the rocks of the quarry—is well worth reading. He saw and was fascinated by what he saw. How many of us look about with unseeing eyes? Perhaps there are some who will never see the wonders of nature, even when taken by the hand and shown them, because people do differ—but instruction can help most of us to see more clearly and to appreciate what we look at.

Many of us enjoy things without truly appreciating them. Few would deny that music, art, literature and scenery can be enjoyed without special training. What is the difference between enjoyment and appreciation? According to the American College Dictionary, enjoyment is "the possession, use or occupancy of anything with satisfaction or pleasure"; to enjoy is "1. to experience with joy; take pleasure in. 2. to have and use with satisfaction; have the benefit of." These all involve pleasure—perhaps even rapturous pleasure—but not, necessarily, understanding and judgment. On the other hand, the meaning of appreciation is given as "1. act of estimating the qualities of things and giving them their due value. 2. clear perception or recognition, especially of aesthetic quality." To appreciate is "to place a sufficiently high estimate on. 2. to be fully conscious of. To exercise wise judgment, delicate perception, and keen insight in realizing the worth of something."

How many, then, really appreciate their surroundings? All who travel to our national parks and other scenic spots enjoy them, but how many truly perceive the worth of these scenic wonders?

More and more, liberal arts colleges are stressing the study of art appreciation and music appreciation, along, of course, with that of literature in our own or other languages. Study of a labo-
ratory science is generally required, too—because of the feeling
that it is a part of a liberal education to have training in the
scientific method, and to know the basic elements of at least one
of the fields of science.

Might not more emphasis be placed on the cultural values to
be attained in studying the sciences, too? Certainly, it seems as
important to me to have an understanding and an appreciation
of our environment and the landscapes about us, as to appreciate
the art and music and literature that afford us recreation and
enjoyment.

Does _appreciation_ increase enjoyment? There may not be a
simple answer to this question, if we remember that many people
agree with the old saying “Ignorance is bliss.”

Who enjoys a symphony concert more—one who goes to listen
with an untrained ear—who is stirred by the sounds he hears,
but who may relax through the concert and let the music as a
whole pass over him; or one who can appreciate the intricate
blending of many tones—who can detect the roles of the many
instruments—whose mind is constantly analyzing the blend that
reaches his ears as he considers the skill and artistry of the indi-
vidual players, of the conductor and of the composer, and who
may be either stimulated or exhausted at the end of the evening?

Who enjoys looking at a painting more—one who chooses it
for a combination of pleasing colors and pattern, and perhaps
familiar subject matter; or one who looks critically and approves
the line, the composition, the choice and use of colors, the tech-
nique of application?

Who enjoys a good book more—one who approves the idea and
the way in which the points are made; or one who not only likes
the development of the theme or plot, but who savors the details
of description, the choice of words?

Who, then, enjoys looking at the Grand Canyon more—one
who is breathless at the great gap stretching before him, the
depth at which the muddy waters of the Colorado flow below
him? Or one through whose mind rush the thoughts of eons of
time laid bare before him—of the work done by the river and its
tributaries in eroding and carrying away the material that once
filled the gap between where he stands and the other rim, ten
miles away—material cut away to the depth of a mile—cut away
in but a fraction of the time that was involved in the formation
of those same rocks, layer on layer deposited on top of some of
the oldest rocks of the earth—and then the tremendous lifting of
those beds before the rain and rivers began cutting downwards?

There is no denying that all of these people get (or should get)
satisfaction and enjoyment from the examples I have cited.
Otherwise, we would not have the sales of art, records and books that we do, nor the great interest in travel to scenic spots. It takes work, effort and study for most people to attain that higher form of enjoyment called appreciation. It may be true that those who have not developed real appreciation are more easily pleased, because they are less critical—but do they ever receive the emotional satisfaction and uplift from true works of genius that occasionally thrill the one who has been trained in what to look for—who can recognize a master touch? I doubt if anyone who has attained a sense of appreciation in any one or more of these fields would consider going back to the more passive form of uneducated enjoyment, although he may not have gone beyond that stage with respect to enjoyment of others of these pursuits.

There is one big difference in this comparison that I have been making between geology and the arts and letters, and that is the fact that Man does not create the things that call for appreciation in geology. Critics may say "This is good" or "This is bad" about man-made works, because judgment can be based on superior or inferior works of other men. But the earth was here long before man, and geologic processes that are at work today are like those at work in ages past. We take what is here, rather than set the rules ourselves, and as we recognize the processes and results, we can always find something to appreciate in the features of the earth. Whether we call them works of Nature or works of God, we can recognize the methodical development which traces back, step by step, revealing the story of the earth's past. If we consider scenery, of course, there are places that will appear uninteresting and dull to many. For aesthetic reasons, such areas will not attract people. Yet geologically, such an area may prove to be extremely interesting, as underground deposits are studied. Not only may resources of oil or gas lie below the surface, but drilling may reveal unsuspected structures—old beach lines, or even buried mountains. The delving for such requires more training than what might be called an introductory course in appreciation, and accordingly will involve a more acute sense of appreciation than would be developed by most—one perhaps partially based on economic reasoning.

Still, tastes differ, and we will find that there are people who prefer the flat, endless plains, with unlimited horizons, to the towering mountains, and vice versa. There are those who prefer the wooded hills to the pounding surf and gleaming sands—and again, vice versa. Others may prefer still coves and quiet waters, or fields of ice and snow. Training is not the only factor in developing a sense of appreciation; we must acknowledge the importance of background. Understanding of what has been closest to
us usually comes before a true appreciation of that which is strange to us. The person versed in geology comes to have an understanding of all these diverse landscapes, and to him they can all be fascinating areas, evoking not only an appreciation of the present vistas, but also of the factors which brought them about. In other words, appreciation does enhance enjoyment.

There is nothing more basic to us than the Earth. Even city-dwellers live in a maze of transported rocks, and if they open their eyes to the variety of building stones, they can see—in addition to the beauty of polished marble and granite—some of the story of past ages.

I feel strongly that there should be more emphasis in our schools on the cultural value of studying science—not just to become acquainted with the scientific method and laboratory procedure, along with the subject matter of a particular course—but to gain a sense of appreciation on a par with that involved in the study of art, music and literature. Our natural surroundings, all around us, are as worthy of delicate perception and keen insight—of an appreciative study—as are the works of man.

Few students have had much training in appreciation of what they may see outdoors before they enter college, except as it is taught them by their families, or perhaps in such activities as Scout work. Many never do receive much training of this type. And still, they are so receptive to it! When I take my freshmen on a field trip to Terry Andrae State Park, a few weeks after they have begun their study of Geology, most of them are amazed and fascinated by the simple things that they have never noticed before—grains of sand rolling up over the crest of a ripple mark and falling down the other side; the circular markings made by a bending blade of long dune grass, as the wind swishes it around in the sand like a compass; the concentration by the waves along the shoreline of heavier, darker grains of sand in certain spots; the holes that open in the damp sand as the weight of their footsteps forces the air from between the grains to the surface.

On this and other trips they learn to recognize the shapes of pebbles and boulders scraped and pushed along under a glacier as different from those rolled along in streams and currents, or sand-blasted by the wind; to appreciate the record left by former seas, millions of years ago, as layer on layer of lime or mud or sand accumulated; to realize that where Milwaukee is now, there once was a vast sea of warm, clear, salt water—a sea full of living creatures, which here and there added their shells to masses started by great colonies of corals, and built up huge reefs; that while this sea teemed with invertebrate forms, the land areas were practically barren of life. By spring, when they travel west-
ward across Wisconsin, I hope that these students of mine are able to appreciate the reasons behind the difference in the scenery of the Driftless Area and that of the rest of the state—to visualize a snowclad Baraboo Range as a protective barrier warding off the massive ice sheet to the north and east from southwestern Wisconsin. I hope that they can picture Devil’s Lake as the great river canyon it once was—that they can sense the tremendous earth movements involved in the upturned beds to be seen at Rock Springs. These are just a few of the appreciative points of view that can give all Wisconsin people a feeling of appreciation and pride in their state—an understanding of differences in topography, soils, land use, and economic conditions.

I feel that we cannot stress too much the idea that the sciences are valuable not only for their technical and methodic side—for their training in thought and logic—but also for cultural reasons. For a full life, is it not as important to have a true appreciation of our surroundings outdoors as indoors? A well-educated person should see what he looks at as he goes by, and should derive from his surroundings a feeling of awe and appreciation when he realizes all that has gone before. He should recognize the enormity of geologic time and his own relative insignificance. At the same time, he can recognize Man as the culmination of evolution thus far, and can appreciate more fully all that Man has accomplished in the relatively short time that he has been on the earth. He should have a basis for scientific speculation as to what may lie in the future—of the intricate balance and relationships in nature, and of all that may be involved when one factor is thrown out of balance.

These are not new thoughts. Most people who have devoted much study to geology have similar ideas about their subject, and feel that it has given them such a sense of appreciation of their surroundings that they want to share it with all others. They are grateful for the help rendered by popular magazines and books, in the education of the public along these lines. At the same time, they feel that there should be more of an opportunity for all high-school and college students to receive such training.