



The Garden Club of Georgia, Inc.

Mission: Beautification ... Conservation ... Education

Sowing Seeds of Knowledge

(published monthly to inform and to encourage participation in NGC Schools)

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VOLUME II, Issue 9 - ENVIRONMENTAL STUDIES ISSUE

As we move along in a new calendar year, Plato and Aristotle's items described as Earth, Air, Fire (Energy), and Water as the elements of the universe have been used as scaffolding for Sowing environmental information. That list becomes complete with this issue devoted to Fire. For purposes here, it equals energy. At no time in the history of mankind, since Prometheus gave fire to mankind and consequently suffered greatly for doing so to keep humans warm and provide heat for cooking, have there been many more available sources of energy, some renewable, some limited in quantity and quality. Ideas about energy use have changed. As we *refuse, reuse, restore and recycle* to conserve natural resources, we have many options and many sources. How wisely we choose is up to us, just as how wisely we choose those who lead us and make laws is very much up to us.

CHANGING TIMES, CHANGING IDEAS and CHANGING PRACTICES: At one point common and accepted knowledge was that the Earth was flat. Likewise, a dozen or so years ago, we in Georgia were told there was insufficient sun in our state to make solar energy practicable, successful, or sustainable. Some actually believed that, but Georgia's U.S. President Jimmy Carter thought otherwise and made solar energy tax credits for construction available. The Whole Earth Catalogue, very much a publication product of its times and read by everyone with even a quasi-interest in conservation and sustainability, published examples and construction details for solar buildings. Included were ones with walls made of water filled bottles, carefully filled only to a point where the expanding freezing water would not cause them to break. My husband even built a small and primitive solar greenhouse, using heavy plastic to cover a simple wooden L frame placed on a concrete patio to absorb sun heat. Rows of plastic milk cartons filled with water to absorb and then release more warmth at night were placed among the pots of seedlings. We actually harvested green beans during the winter.

All went well though a first winter, but in an early and especially cold second winter, an ice storm broke overhanging limbs from nearby trees that crashed through the plastic. When we added to the house, we built two of the rooms to meet solar tax credit specifications with double paned sliding glass doors to let in sun warmth, quarry tile to absorb its heat, and ceiling fans to move the warmed air. By golly, it worked. It worked until trees grew and blocked much of the sun.

BOOK RECOMMENDATION: Each of Sowing's environmental issues has included a recommended book on an environmental/conservation topic. Let's do a change of pace and level this time. To keep this issue's book choice close to and supportive of GCG, Deep South, and NGC efforts, please purchase a copy or more of *The Frightened Frog* by Brenda Moore and published by National Garden Clubs for yourself, for your children or grandchildren, and/or give one to your local elementary school or schools for their libraries, be they public, private, charter, or church related. It can also be used as a youth group program source. Or offer to be a volunteer guest reader in the early grades at a nearby school and read **The Frightened Frog**. With stylistic curtsies to Dr. Seuss, it is charming and contains good information for all, especially for children in kindergarten through third grade. Spread the word! Buy the book! Pass it along! **How nice and fitting it would be if each GCG club bought a copy of this book and gave it to a school's library as a service to youth! That's something we could all do!**

I was first officially taught about amphibians during first grade when Mrs. Chappell brought an aquarium with tadpoles in it to the classroom and placed it on a wide window sill for us to watch. We were allowed to look and not touch and all filed by it at least twice a day, fascinated by diminishing tails becoming little lumps and then, slowly, legs. That was a brilliant way to have children slow down and look carefully as they came back in a line from recess. It was a poignant Monday when they had all developed at least two legs and needed more space as well as a different habitat to finish growing into frogs. They had gone to a nearby creek over the weekend. We missed them. We'd learned because we'd observed.

But even before that, one of my great grandmothers had taught her daughters and those sisters had taught their children a charming song about Twenty Froggies who *went to school, down beside a rushy pool*. In turn my generation has passed it along to our children and grandchildren. If the eight of us cousins, all still alive with the youngest ones now in their mid-seventies, ever all get together again in one place, we could surely still sing about scores of coats of green and vests all white and clean with great energy and affection. Family sing-alongs made lengthy car trips fun. That's six generations and counting for a family singing about the importance of educating the Twenty Froggies. Google or other search it to discover that it was originally a poem by the Englishman George Cooper who lived from 1820 to 1876. Let me know if you know it! That song is very much about learning and teaching and the continuation and importance of both.

Added Recommendation: Past issues of this publication have included information about stream buffers. There are several applicable buffer videos available through the Georgia Water Coalition on You Tube, including ones about Stream Buffers and Intrusion of Groundwaters. GCG is among founding partners of Georgia Water Coalition. Check out its website; your club can join gratis and help with filling the "... Education" part of the GCG Mission.

BACKGROUND REVIEW and on to forms of energy and variations on energy available to us:

Wood fires were surely used first for cooking and warmth with torches for lighting one's way at night or inside caves, surely a great step for a man and for mankind. Trees are a treasured continued renewable resource. **Peat fires** in areas where it is available are of course a variant, using peat, a natural resource that's part of the process of swamp bottoms' slowly becoming coal. Oddly, many trees now grown in Georgia are converted into **wood chips** and shipped abroad to provide energy for power plants there. (Maybe that's what happens to trees cut from in front of billboards.) The drawback is that the sequestered carbon dioxide in the wood is released back into the air as carbon. Oil is currently evidently low enough in price to cover shipping the chips across the Atlantic. Somewhat relatedly, among our largest exports to China is recycled newspapers. **Whale oil** became a major source for lamps. **Tallow** (from beef and sheep fat) and **beeswax** became candles and made reading at night possible.

Windmills to pump water and grind grains began before **hydroelectric plants** providing electric power were built.

Coal: The Industrial Revolution and the mining and transportation of coal itself broadened uses of steam for heating and engines that have mostly replaced horses and other draft animals. Burning of **mined coal** created unhealthy air that became dangerous to breathe in crowded cities as once pristine buildings and bridges in such cities became blackened. We as a generation almost forgot that Notre Dame in Paris, London's Houses of Parliament, and Saint Patrick's in NYC were not built of black stone, but of stone that gradually became blackened with soot. Remember the film of soot on train windowsills in the decades before air conditioning? Scrubbers at power plants presumably clean air of all harmful chemicals. Coal miners' lungs suffer and strip-mining turns mountainsides into ecological nightmares as runoff harms water quality.

Moreover, coal burning plants for producing electricity are notorious for the need for water for processing and to reduce heat resulting from that process. Such plants continue to dump heavy metals and chemicals into **retention ponds/lagoons** where they settle to the bottom and remain unless disturbed. When such ponds, lined or not, overflow or leak, waters made toxic by chemicals in **coal ash** including mercury, arsenic, and lead become serious problems. Parts of North Carolina are currently experiencing such toxic flow into streams and rivers as a result of unexpectedly large amounts of rain last fall. Note that most coal plants have large ponds/lagoons nearby and that one never notices swimming, fishing, or boating at such locations. Some even contain decorative fountains to help cool such waters.

Care needs to be taken when disturbing river, stream, and lake beds because the heavy toxic metals are stirred up and circulated in the waters, ingested by marine life. That which survives is passed along to humans as seafood. Currently, there are plans to add coal ash and/or water containing it to landfills, including one near Jessup GA.

Coal plants for electricity that generated 39% of U.S. electric energy in 2014 in some areas are being phased out and replaced with more **renewable energy** sources including wind and solar. In contrast, in the same year, Germany produced about 27% of its energy from renewable sources. On one day to be celebrated, July 25, 2014, Germany set a new record for renewable energy by producing 78% of that day's energy from renewable resources.

Note that in Georgia, a major power provider increased renewable resources for energy by approximately three percent last year which was laudable and received much favorable and widespread press coverage and appreciation from conservation organizations. This year, however, the aim is to reduce the development rate for renewables back to only a single percent as a three steps forward and two back stroll through the environment.

Oil: Many countries including ours are highly dependent on oil. The U.S. has generous reserves and resources. Beware of offshore drilling proposals and those who want it. Remember BP in the Gulf of Mexico and that Shell Oil was prevented from Arctic drilling. Plans to build more pipelines through this country from Canada or the Midwest to Atlantic ports to be able ship it and/or oil refined as gas overseas are not environmentally friendly and can be highly risky. There are those who want to do oil exploration with potential offshore drilling off Georgia's coast.

Fracking: It's not just the oil it produces; it's the water it takes to frack and what happens to that water. Such hydraulic fracking practices to inject water into subterranean rock to release and pump up can be dangerous in themselves. Nothing much is press covered about what happens to such water after it has been used to frack. A close to bottom line is that such water then needs to be processed and cleaned or stored as contaminated water somewhere. One suggestion has been to ship such water from the Midwest to rural coastal parts of an adjacent state to store underground. That's almost up there with the transportation and storage of radioactive water from nuclear plants. Think of the Savannah River Site in South Carolina, near Aiken, itself near Augusta, and its problems with leaking containers. Think of such water in nearby Oak Ridge, TN that may be sent into our state for storage.

One current good bit of environmental protection news about fracking is that oil from fracking needs to be priced at a minimum of \$40 a barrel to cover expenses to produce it and oil is now priced in the mid-thirties a barrel.

Natural gas: It's often moved by rail or pipelines with inherent possible opportunities for leakage or damage to pipes and rail tank cars.

Renewables: **Solar energy** can be highly effective, as can **Wind energy**. Both were covered in the Fall 2015 Sowing. Offshore wind farms are being considered for the Georgia coast.

Nuclear Plant Generated Electricity: Plant Vogtle, in the process of being expanded by Georgia Power and other partners, near Waynesboro, near the Savannah River, is still behind schedule, and still experiencing cost overruns. If it is ever finished and works as planned, it will be amazing as the first new U.S. nuclear plant in many years. It also may be that unleashing nuclear energy may be as major as Prometheus giving mankind fire. It is a very complex topic, including part taxpayer financing approved by the General Assembly and one for each of us to explore and consider carefully.

ABOUT ALL THE WORDS IN BOLD: Because we as GCG members join at different times and arrive with different knowledge levels about conservation and the environment and have or have not all taken the GCG offered NGC Environmental Studies courses, words that may

not be familiar or new words for old ones have been put into BOLD. Renaming happens regularly, about every ten, years and provides good reason to upgrade and revise materials. They can be checked out through any good search engine or on webpages of conservation organizations. Remember that the sources you choose for information will often determine much of and the quality of the information you receive.

ALSO, Check the GCG website for applicable Position Papers.

Use the following organizations' websites for information and consider joining them. You can sign up for their newsletters. They are also full of great photographs to accompany this publication. Most have regional and national levels.

Georgia Conservancy

Georgia Sierra Club

Georgia River Network

Riverkeeper for your watershed

Georgia Wildlife Federation

Georgia Water Coalition

Environment Georgia

American Rivers

Because most conservation in Georgia and elsewhere is determined by laws made by a General Assembly and by Rules to follow for them as decided by Environmental Protection Agencies, it greatly helps to have a source for navigating the resulting intricate dances. Take some time and explore openstates.org. Select Georgia. Then enter your address. You can then track your legislators, check out their voting records on specific Bills, read the Bills themselves, follow progress of Bills, and more. You can download the app for the site and do some serious *volunteer citizen advocacy* which is what GCG members do and do it all online. It's the best how to website I've found so far - at least as good as sliced bread. Bills to check out are **SB 36/HB 116** on Groundwater Protection. Find the name and contact information for your Georgia House Representative and State Senator, met them and, according to a former GCG President, get to know them on a first name basis. Stay in email contact during the General Assembly now in Session. Come to Capitol Day. Let those who represent you know your thoughts and reasons for them and request yea or nay votes Bills and issues. A brief email stating your areas of interest and concern

Participate! Monday evening, I made what was to be a quick check on how Iowa caucuses (cauci, likely for those with a little Latin) were going and immediately saw how much difference a few participants can make. And, yes, I stayed up and watched for hours, amazed and astounded by how close votes can be and results even decided by a coin flip. Astounding! Attend **Capitol Conservation Day** and check out dca.state.ga.us for stream buffer details.

PLUS: If you have topics you'd like to have covered in these newsletters, let me know and I'll be happy to include them. We're all in this *GCG Beautification ... Conservation ... Education* effort together, learning as we go, sow seeds, and grow.

“Conservation is a cause that has no end. There is no point at which we can say, ‘Our work is finished.’ ” Rachel Carson