



THE HIGHLANDS VOICE

NON-PROFIT ORG.
U. S. POSTAGE
PAID
PERMIT NO. 2831
CHAS., WV 25301

Published monthly by the W.Va. Highlands Conservancy

VOL. 23, NO. 9, SEPTEMBER 1990

DOE Commissioner Permits Talks

Expectations that Larry George, newly appointed Commissioner of the Department of Energy (DOE), at least figuratively shares two of the major threats faced by underground miners—unstable roof support and poor ventilation—were put to rest during a two hour interview Friday, August 31, 1990. There is plenty of fresh air in the Washington Street offices and available support ranged from the portrait of Thomas Jefferson in the Commissioner's office to a courteous staff.

The informal talk was due in part to George's connections with the Conservancy. Many members worked with him in the rivers campaign and during his presidency from 1983 to 1986. George became interested in the West Virginia environmental movement during his years in the Army Corps of Engineers. He is best known in the Conservancy for his work in achieving designation of the Cranberry Wilderness and work towards the passage of the WV National Interest Rivers Act. This is his second appointment within the Caperton administration.

Once a division within the Department of Natural Resources, then Governor Moore recommended and was rewarded with the establishment of DOE in 1985. The practice of past commissioners to promote the coal industry was a personal choice not in the statutes that describe DOE. DOE authority is concerned with four activities. Regulation of surface and deep mines: WV has primacy over federal SMRA. Oil and gas regulations: Resource conservation, safety and protecting royalty interests are principal responsibilities. Abandoned mines land programs: A

federal program to clean-up mines abandoned before August 3, 1977, is funded by a 25¢ charge on every ton of coal mined. A state fund to clean-up mines abandoned after the federal cutoff date is now valued at \$4.5 million. Health and safety: The most critical responsibility of the agency, the health and safety of the miners and their work place is the priority item in agency agendas.

Most of the discussion focused on the coal industry and its effects. Mr. George didn't speculate upon how the Middle East crisis will affect coal; why supertax credits were given to coal companies; why the Tax Department gives coal a special place in the West Virginia economy; how well or how poorly industry associations, environmental organizations, citizens groups, and local government confront the issues of resource allocation and land use; or, how the cultural heritage of the coal industry affects current practices. He did comment on the mandate of the DOE; the legislative origin of the mandate; and what variables influence his decisions.

Aware of the discretionary nature of some decisions, George made clear that his role as facilitator in conflicts between coal companies, environmental interests, and communities must provide a response at every level of the conflict. George believes that the concerns of mine workers employed by coal companies who are given permits to mine or denied permits to mine should be answered by his office. He illustrated by showing a stack of letters

(continued on page three)

Non-Point Source Program Underway

Since July 1, 1990, eight full time employees, six being new hires and two reassigned employees with the Soil Conservation Service, have begun work under the Non-Point Source Water Quality Plan. Submitted by DNR for EPA approval last year, the proposed plan passed with flying colors. Interviews for positions in the agricultural and construction phases of the program were conducted by the State Soil Conservation Committee over several weeks. Peg Reese, Resource Conservationist explains, "It was a difficult choice among several strong candidates. The job descriptions, like many environmental positions, do not easily fit the credentials of people in the natural sciences. It was the unique experiences of the candidates that clinched the decision to hire in some cases."

Program Coordinator Randy Lefevre oversees the daily administration of the demonstration projects and provides the vision for what should be. "Our goal is to prevent loss of resources. Simple and effective management techniques applied in the planning stages of development become a cost savings to developers. In less than ideal circumstances, where repair is required, restoration provides direct benefits to the land and enhances its value."

Effective coordination of all agencies involved and utilization of staff capabilities include overseeing a GIS computer system to evaluating field observations. A trained biologist with a speciality in fish hatchery

management, Mr. Lefevre's skills and resourcefulness have been tested in Peace Corps assignments. In Africa, he applied fish pond and farm management techniques to sustain a healthy fishery and a fertile crop and grazing area. Opportunities to establish systems and methods that prevent wasteful practices and practices that damage the land and watershed in the agricultural and construction industries in West Virginia are numerous. Coming home to his native state, Lefevre is anxious to apply the techniques he has seen proven.

The technical skills represented by the staff, the resources of other agencies concerned with water quality and land use and guidance from State Soil Conservation Committee Executive Director Lance Tabor give Lefevre strong support. "I feel very good about the team work approach that is developing," Tabor said. "This is a partnership story that should be followed by newsletters like the VOICE and given coverage in other media."

Projects already underway in Greenbrier County with a focus on animal waste containment were an ideal fit with the goals of the NPS Water Quality Plan. The permeable limestone karst in the County makes the ground water especially susceptible to contamination. The NPS plan was designed and is being implemented to compliment already existing efforts at responsible stewardship.

(Continued on page three)

WILD ALLEMONG

On October 22nd demonstrations will be held at all National Forest unit headquarters across the country, including the Monongahela National Forest in Elkins. These demonstrations will largely be shaped by the participants but will have as their main focus the revision of all National Forest Land and Resource Management Plans to greatly favor wilderness and remote habitat expansion as well as old-growth forest preservation while de-emphasizing human resource consumption, particularly welfare logging, mining and road-building.

These are very critical issues for all forest units, including MNF, at this time because the current national administration, its self-serving rhetoric aside, is simply continuing its predecessors policies of rampant pillaging of the forests. Accordingly the MNF administration is tacitly supporting greatly expanded gas drilling and pipeline construction, and continuing full-bore with its current practice of clear-cutting many areas adjacent to existing wilderness.

Your participation in this effort in trying to help free the forest from government and commercial slavery is much needed. It is certain that if we do nothing the exploiters will have their way, then to the degradation of the Earth and also, ultimately, ourselves. Please plan to participate in this demonstration of support for a wild Forest in any way that you can. If you cannot attend in person, write to the MNF supervisor and let him know that you want to see the Forest managed in a truly eco-logical fashion, which means simply leaving large areas alone. If you would like more information regarding this demonstration or to receive a copy of Forest Plan Alternative Wild, which is in preparation, please send an SASE to:

Wild Allemong
P. O. Box 1689
Greensburg, PA 15601



Michael S. Quick

Report on the Earth

by Mary Moore Rieffenberger

If everyday is to be Earth Day, everyone must get involved. Involvement at the local level by individuals may become a part of greater involvement in an energizing exchange. It happened at Bethany College when Dr. Paul R. Ehrlich and his wife Anne spoke at the Earth Day Symposium and dedication of the George M. Sutton Laboratory of Ecology and Ornithology. The following notes are highlights from this event. It includes several insights into making Earth Day happen with each sunrise.

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EARTH DAY REPORT 1990

Ronald Canterbury, a graduate student at Marshall University, working with Dr. Thomas K. Pauley, spoke on *West Virginia Amphibians and Reptiles of Special Concern*. He listed four species of salamander (including the Cheat Mountain Salamander); four frogs, two cricket species (Northern leopard and upland chorus); nine turtles; five snakes; three skinks; and the Eastern spadefoot toad.

★★★★★

Thomas J. Allen, wildlife biologist with the West Virginia Department of Natural Resources, discussed *Threatened West Virginia Butterflies*. There are 130 species in the state, and three are threatened with loss of habitat. The Regal Fritillary, a plains species, has been hurt by the chemicals intended for the Gypsy Moth. The first two instars (larval stages) of the Diana Fritillary, a woodland species, are highly susceptible to Dimilin. Strip-mining has had a bad effect also; there are no violets on strip mines. The Wyandotte Grizzled Skipper, a shale barren species, has been severely affected by the Gypsy Moth spray. Again, in the latter part of April and the first of May, it hits the first two instars. The Gypsy Moth is moving too swiftly, and the public is too insistent on spraying.

At this point, Dr. Ehrlich asked if there is any other reason to continue spraying. The answer was, there is really no other reason, and there is not enough public awareness of alternatives. For instance, natural enemies, which can control population explosions.

★★★★★

Dr. Katharine B. Gregg of West Virginia Wesleyan College urged the *Protection of Rare and Endangered Plant Species in West Virginia*. Two hundred and fifty-three native plants are likely to become extinct in America by 1993. Extinctions are occurring in the United States at a rate three times higher today than in the past 200 years.

Three species in West Virginia are endangered: *Arabis serotina*; *Ptilimnium fluviatile* or *Harperella*; and *Trifolium stoloniferum* or running buffalo clover (shades of our pioneer past). Thirteen other plants in West Virginia probably should be listed as threatened. *Virginia spirea* has been proposed to be listed as federally threatened.

Habitat destruction by man is the most common cause of extinction. Action by herbivores such as deer does much harm. An example is a stand of *Cypripedium reginae* or showy lady's slipper in Greenbrier County. There were 900 flowers in 1980; some 500 in 1985; less than 60 in 1986; under 10 in 1987; and 0 in 1988 and 1989. This had been fenced in now for two years and the overgrowth removed. With much jubilation, Dr. Gregg announces she visited the stand in June, 1990 and found 6 flowers.

She wants the State of West Virginia to survey the state's professional botanists to find out their expertise and interests, and to actively solicit their help. Sources of funding available to botanists for working on rare species should be publicized. Make available stipends and expense monies to encourage and enable botanists and their students from West Virginia's academic institutions to begin making more substantial contributions to rare plant preservation. (Might this be a project for the Garden Clubs?) And include plant species being tracked by the West Virginia Natural Heritage program in the Non-Game Project. West Virginia and the Nature Conservancy should continue to search and establish suitable preserves on both private and public land. More funds are needed for species biology. Botany in West Virginia needs more field biologists, more preserves, and more education from kindergarten through graduate school.

Dr. Gregg said she is really pleased and encouraged that the Natural Heritage Program staff has been increased from 1 to 3 permanent, full-time employees. "Thus, we should look forward to increased stewardship by the state of its natural resources."

★★★★★

Dr. George A. Hall, Professor Emeritus of West Virginia University, described *The Future of Birdwatching*. There are 180 breeding bird species in West Virginia. Two are endangered—the Bald Eagle and the Peregrine Falcon. Three are threatened—the Loggerhead Shrike (due to change in agricultural practices), and there have been no sightings of Bachman's sparrow and Bewick's wren.

West Virginia is a woodland state. Due to "forest fragmentation," which makes for small tracts—too small—the Blackburnian, Kentucky, and Hooded warblers are in decline. They now have to build their nests near the edge of the forest, which make them more liable to being parasitized by cowbirds. The tropical rainforest is being cut for cow-pastures. Our migrant birds go to the mid-elevation Andes. Now, that area is being used for coffee-tree plantations.

There are other long-range causes besides de-forestation. The red spruces are dying—probably because of acid rain. Another cause is global warming, which will lead to a drier climate. If this comes to pass, the population of flowers and birds will be changed. It will go from warblers to sparrows.

A similar thing happened 9,000 years ago. Gradually, the forest migrated back. But now, the forest won't have time. Much of the Eastern United States will be converted into dry

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grassland. Several grasslands, however, are also having a loss of some species. The fate of the birds will track the fate of the general environment. (Dr. Ehrlich added that migration in radar data shows a 50% decline in 20 years.)

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Dr. Mary Etta Hight of Marshall University aroused sympathy for *Endangered Bats in West Virginia*. It is probably the most maligned group of mammals, and few are more beneficial. There are 12 species in West Virginia, and two are endangered. They are the Indiana bat (*Myotis sodalis*) and the Virginia big-eared bat (*Plecotus townsendii virginianum*).

Indiana bats winter in 8 counties in West Virginia. Their greatest danger is in their place of hibernation. For every disturbance, a bat loses 30 days of energy during hibernation. The Virginia big-eared bats mate in the Fall and have delayed ovulation until Spring. This bat has

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REPORT *(continued from page two)*

only one offspring each year. If there is any disturbance during hibernation, the young can be knocked loose and fall to the floor—to perish.

There is a small population in the Appalachians and the Ozarks. There are 10 major caves in West Virginia, some of which are for both maternity and hibernation, and some for only maternity. Nine are used for Summer; not many caves have the right temperature and humidity. When this population is concentrated in such a few caves, any disturbance disturbs a large number. Bats are very vulnerable to human disturbance (speleologists take warning!), house cats, raccoons, and—as insect-eaters—to pesticides.

Every year the big-eared summer caves are monitored, and every other winter the hibernating colonies of both species are monitored. Roughly 5,600 Indiana bats hibernate in the state; there are 5,500 Virginia big-eared bats hibernating, and 3,900 in summer colonies.

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Anne H. Ehrlich, Senior Research Associate, Stanford University, ended the Symposium with *The Importance of Bio-Diversity*. She said there are 30 million species alive on the planet today, most of them in the tropics. Humans have taken over the entire planet, and we are busily tearing it down. Eighty-eight thousand square miles in tropical forests disappear every year. (One hopeful item—the new president of Brazil seems to have his heart in the right place.) We are accountable for the rainforest extinction, the loss of habitat area, and the loss of large-animal species in North America. A biological inventory is needed. The final refuge will be National Parks. In the meantime, we're throwing away wild relatives of our crop-plants and their genes.

Mrs. Ehrlich asked two questions then. Why should we care? She answered with Esthetic, Ethical, and Economic reasons plus Ecosystem Services, which are comprised of:

Atmosphere	Climate/Weather
Fresh water	Nutrients—Wastes
Pests and disease	Pollination
Food and minerals	Genetic library

It's kind of rare to learn enough and to do it right. There has to be political action. Restoration is not a solution to the problem. She quoted Aldo Leopold as saying "The first rule in tinkering is to save all the parts."

Earth Day Symposium Planned

General plans for a symposium on the West Virginia environment were adopted by an ad hoc planning committee which met on August 24th. Two subject areas will be examined. Issues related to **pollution and community health** will be considered in sessions at West Virginia State College, and **key threats to wilderness areas** will be evaluated in sessions organized by the West Virginia Academy of Sciences.

One of the major aims of the conference is to develop and publish an authoritative proceedings with as many as 100 papers on environmental issues and activity in West Virginia. All organizations whose activities significantly affect the environment, directly or indirectly, are invited to participate.

Organizations that wish to include descriptions of their programs and goals in the proceedings may obtain further information by writing to: Earth Day Symposium, Norman Steenstra, Citizens Action Group, 1324 Virginia Street East, Charleston, WV 25301, or by phoning WVSC at 766-3019 between 4:30 and 5:30 pm Monday through Thursday.

Individuals and organizations are also invited to contribute papers on key environmental issues, and to contribute reviews of (or comments on) environmental books and newspaper and magazine articles and editorials. As above, please write or call for specific instructions.

Contributed papers may range from one page summary statements to detailed reports of approximately six pages. Reports and articles published elsewhere are welcome if permission from previous publishers has been obtained. Exact deadlines, page limits and other details of the symposium will be determined by a steering committee of representatives from each contributing organization.

Wax, Not Flame, May Lure Moths

It is the warm wax rather than the flame that attracts male moths to lighted candles, a Florida biophysicist says.

The scientist, Dr. Philip S. Callahan, who is also a consulting entomologist, said experiments have demonstrated that the particular wavelength of infrared radiation emitted by warm candle wax coincided with the wavelength emitted by sex-attractant chemicals produced by female moths.

This invisible radiation could be detected by light-conducting spines protruding from the antennae of male moths, Dr.

Callahan said, and misidentified as radiation from female moths. The spines act as radiation guides similar to the optical fibers used to transmit the pulses of light by which modern telephone communications are conducted.

Dr. Callahan said he believed that when a male moth flies to its destruction in a candle flame, it thought it had found a female moth. It was just bad luck for male moths that radiation from female moths happened to have the same wavelength as radiation from candle wax, he said.

NYT 8-28-90

DOE *(continued from page one)*

from individuals who feel their community will suffer immediate economic effects if a coal permit is denied.

Confident in his belief that all points of view must be examined, the traditions of

Non-Point *(cont. from page one)*

Excluding the problems of mines and forestry which are being addressed by separate departments, non-point source pollution addressed by the Lefevre team includes all manner of land disturbances: road construction and maintenance practices, runoff of road salt, runoff of oil and gasoline, other chemical spills and leaks, erosion and sedimentation, agricultural runoff with concentrations of fertilizers, pesticides, herbicides, sediments, salts, minerals. The initial demonstration projects were chosen for their visibility and potential to reach large numbers of West Virginians with the message about non-point source pollution.

The Tomlinson Run Demonstration Project is addressing the sediment loading problem of this recreational lake. The strategy emphasizes reducing sediment build-up by increasing awareness about activities that contribute to erosion. A clean lake would eliminate the need for dredging. A wetland that feeds the lake will be studied to determine how effective it is in eliminating sedimentation. The NPS technician for the project is conducting evaluations of the area. Identification of sources of erosion is accomplished by referring to existing documentation of the area and site visits.

Another project in Mason County will be analyzing the data from wells to determine a baseline measurement for ground water quality in the area. The rapid development and importance of tourism in the southern part of the state will be recognized in a project that focuses on construction practices. Revision of the Erosion and Soil Control Manual now referred to by agencies would establish modern guidelines for best management practices. Critiques of the methods used in road building and the practices of topsoil and earth removal will be aimed at preventing large disturbances of earth and earth loss. The use of pesticides along highways will also be investigated. Integrated pest management techniques to reduce pesticide use and hydroseeding of plants that contribute to the aesthetics of the area and health of the soil will be encouraged. NPS technicians are currently working with DOH on a wild flower seeding program.

Each project promises tangible benefits. An important opportunity to contribute to the scientific data about specific West Virginia habitat will also be a benefit. A meaningful up-to-date record of erosion and sedimentation control techniques in an agricultural and construction context for the unique conditions in West Virginia topography and geography will form the foundation for a valuable bank of data.

Information already available for more than half of West Virginia's 55 counties include a soil survey and soil maps. Issued free at every Soil Conservation District office, the documents give information that should be known and planned for in any land use decision.

Future plans for a training center and certification procedures will only be valid with current data from such active projects that verify the limits of techniques and work for adjustments that produce healthy and beautiful landscapes.

the industry are a strong influence. Traditions that influence how coal is mined are recognized as traditions by George. The current status of the industry has DOE focused on communicating with legislators and recruiting up-to-date technical staff.

As a past counsel for the WV legislature, George feels comfortable with monitoring the action and contributing effective and useful information upon request. His wish list would include funds for more inspectors. The 56 working inspectors do not meet the minimum federal requirement of 80 inspectors. The need for stronger regulation of health and safety is seen as a more critical need than environmental regulation. The fatality rate has doubled and the injury rate has increased by 15% (1989 figures). Most injuries occur in the mines employing 20-25 miners. Roof control, ventilation and electrical problems are the chief cause of death and injury.

Work toward solving the acid mine drainage (AMD) problem is being undertaken by a policy advisory committee. George is certain that the predictability of acid producing seams is not an ability that geologists have today. Evidence gathered by DOE from water samples support this site-specific evaluation of the problem. Presenting this data in the form of a matrix with different areas representing different degrees of acidity will provide a quick reference for the degree of acid to be expected.

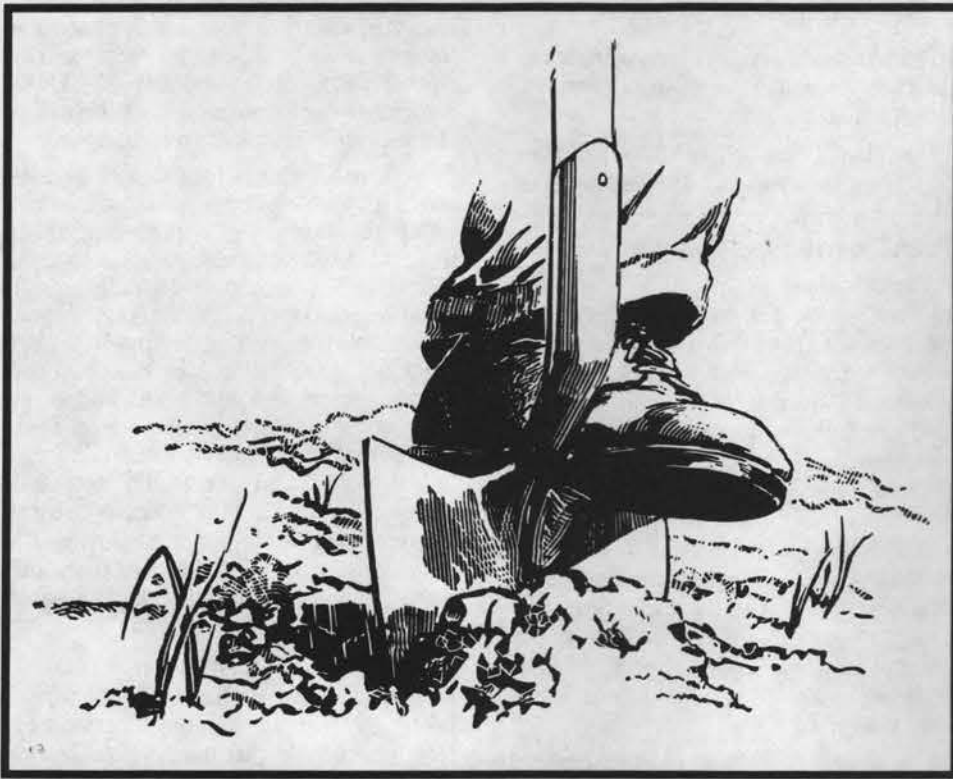
The administration policy of waiving fines of less than \$1000 has been reevaluated and changed. George explained that the original rationale behind the waiver no longer applied because it was irrational to attempt a court tie-up for such an insignificant amount. Focus on the practice in the media had created a credibility problem for DOE.

Another change in administration, while not attributable to George, did happen only a few days after he became Commissioner. Surface Mine application forms are now up to federal standards. The application form went from under ten pages (mostly double sided) to just under 50 pages (single sided), in 21 sections.

The talk of consolidating all environmental and resource agencies remains in a committee. They are developing a reorganization strategy. The DOE, Department of Natural Resources, Air Pollution Control Commission, and the Environmental Health Services agencies would become a single entity. Organization would be grouped into land use concerns, infrastructure integrity, and education. The general goals of this ideal mega-agency have been stated repeatedly as a deliverable. In reality, clean water, clean air, effective sewage and other community services, are not available every place or considered by some misinformed officials to be a goal.

In this decade of the environment, George predicts that more people, more agencies, more businesses will come face to face with specific consequences of having less resource to respond to more demands and new needs. Outlining the permit process in a context that embraces new knowledge about conserving resources and conservation traditions in an ecological manner will provide better management of resources. The consequences of poor resource allocation will not benefit anyone.

If this seems too vague and abstract to function in place of the misnomer now known as DOE, keep in mind George's practice of listening to the consequences government regulations and policies have on the individual.



abiotic factor how soils are studied

Geographic observations combined with knowledge about geology provides enough input to identify a soil type. Five major factors determine soil formation: climate, living organisms, parent rocks/parent material, topography and time. Information about these factors can explain processes that created soil and define future effects on existing soil.

Every soil has a mineral profile. Three horizons—A,B,C—lie parallel to the earth's surface. Each type of soil possesses a horizon. Boundaries are gradual and indistinct between the horizons and many soils have

only an A horizon and a C horizon. The A horizon is the surface soil. The B horizon is the subsoil. Together these horizons are often referred to as the solum. The C horizon is the parent material.

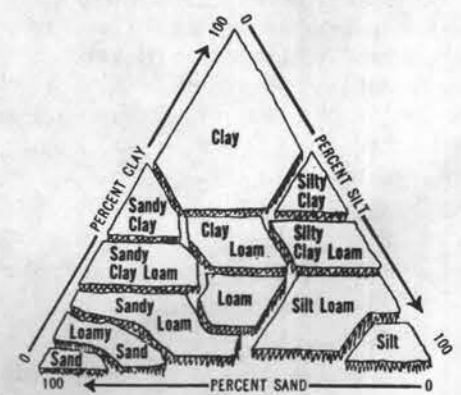
Soil is first created from changes in the rock. The weathering of rock is slow and continuous. Soil parent material is rock disintegrated by climatic influences. The sunshine, the rain, the frost and the wind bring heating and cooling, freezing and thawing, wetting and drying. The structure of the rock weakens from these forces. Within the rock minerals react with air and

water and more changes are brought about. All of these stresses, in time, weaken the rock. The parent rock disintegrates. The parent rock becomes the first or C horizon of soil.

The mineral blanket created by this disintegration sustains micro-organisms such as bacteria and fungi. Larger more complex plants follow and the baby soil becomes enriched, more complex with the death and decay of the micro-organisms. The increasing depth of this layer becomes the first sign of the A horizon. Sometimes a B horizon is formed along with the A horizon. Generally, the B horizon follows the formation of the A horizon. The depth of each horizon varies as new compounds are formed and one horizon grows as another shrinks. Plants contribute to these changes by leaching and depositing nutrients that move from one horizon to another.

PHYSICAL PROPERTIES

Size and arrangement of soil particles may be generalized by rubbing a handful between your fingers. Gravel is classed as greater than 2.0 millimeters (0.08") to 76 millimeters (3") in diameter. Particles smaller than this are divided three ways into sand, silt and clay. Particle size determines the flow and storage of water, movement of air and capacity of soil to supply nutrients to plants. Most surface soils are about half inorganic particles by volume. The texture triangle shows the available combinations.



The texture triangle shows the percentage of sand, silt, and clay in each of the textural classes.

Movement of air, water and the flow of heat through soil is determined by the porosity and pore size distribution—structural features that constantly change with the amount of organic material present. Water and air occupy the soil pores in amounts that vary reciprocally. Soil air differs from the atmosphere above it by containing 10 to 100 times as much carbon dioxide (CO₂) and slightly less oxygen. Consumption of oxygen and release of CO₂ by plant roots and micro-organisms contribute to the difference.

SOIL CLASSIFICATIONS

Soils are classified and named just as plants and animals. Soils are identified by their horizons, their texture and the kinds and amounts of minerals.

Soil series, named for the localities or towns near where the soil was first defined, are the units seen on soil maps and survey reports. A soil series is a group of soils that have horizons that are basically the same and differ only in texture at the surface and the composition of parent material. A series may have one or several soil types.

The type category is the smallest level of classification. It is considered a subset of the soil series. Type is determined from the textural features. If the surface of an area is 'sandy clay' and it is in the Kanawha series, the name becomes 'Kanawha sandy clay.' Sometimes information about the soil phase is also included.

Phases of soil refer to distinct characteristics like slope, degree of erosion, stoniness, drainage, flood protection. Phases in soil classification would be analogous to grouping animals by their age. For example, old Holstein cows. Continuing the previous soil example, 'Kanawha sandy clay,' would become 'Kanawha sandy clay 8-15% slopes eroded,' or 'Kanawha sandy clay mixed alluvial.'

Familiarity with soils allows a mental image of the landscape to be formed just by reading the soil map. The history of the land is manifest in the soil types and the parent material from which the soil was formed.

Home Gardens and Lawns

Charles E. Kellogg

The management of our garden soils follows the same principles as the management of field soils, but we use different practices. In our gardens we aim for variety, and we have a wide range of plants—grasses, annuals, perennials, shrubs, vines, and trees.

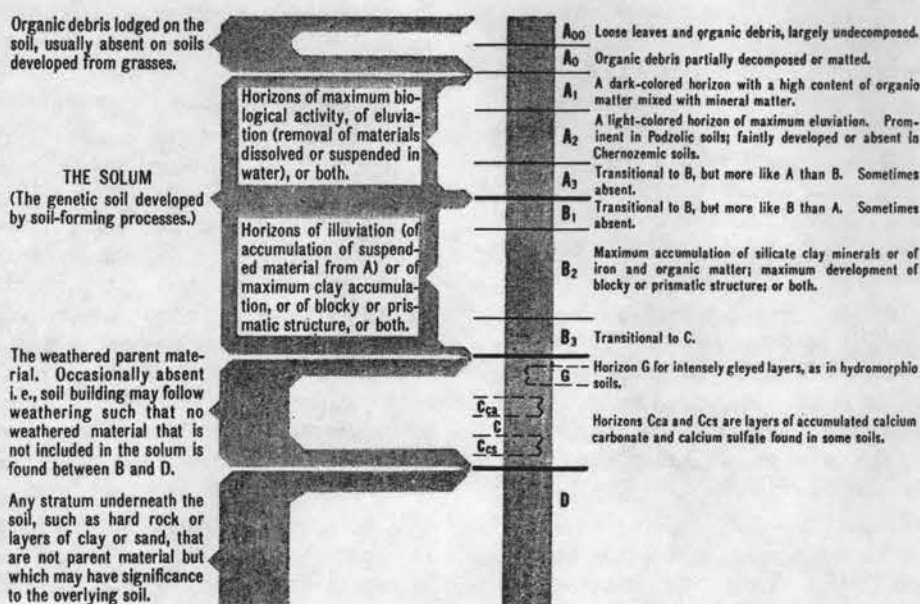
We try to have flowers and fruits through the seasons and ornamentals for sun and shade. Yet the total number of plants is small, and we can treat them individually. Even with simple handtools, we have a chance to apply the principles of soil management over a wide range of combinations more precisely than the farmer can do for a few crops in big fields.

We have little choice in selecting our garden soils. Rarely can we choose level, stone-free, sunny, "rich loam" soils, which are recommended so blithely in the garden books and on the backs of seed packets. Once the location of the house is fixed, we must take the soils we find and make the best of them. Oftener than not, the soils around the house are not well suited, as they are, to the plants we want to grow, especially if builders have destroyed the natural surface soil and left thin topsoil over fills of trash and raw earth.

Thus many new home gardeners may begin with soils that are too hilly, too sandy, too clayey, too dry, too wet, or too infertile for good gardens. But good garden soils can be made from them.

By "garden," I refer to all the cared-for soils and plants around the home—the kitchen garden, flowerbeds, lawns, and plantings of trees and shrubs. Included is a variety of plants that have unlike soil requirements. Some need shade. Others

(continued on page five)



A hypothetical soil profile that has all the principal horizons. Not all of these horizons are present in any profile, but every profile has some of them.

BEES ARE BEAUTIFUL

Current beekeeping practice in West Virginia is a composite of centuries old practices combined with modern techniques that promote healthy honeybee colonies. Emphasis on the local beekeeper echoes other advice about agricultural products that encourage the buyer to shop locally.

Speculation on the significance of bees should include appreciation of their significance to plants. These benefits are not reflected in the economic data that calculates the millions of dollars in annual honey production. The importance of bees in crop production and pollination of species also goes unseen in calculations of food prices in the grocery store. It is said that if all honeybees died overnight the world would starve in three years. Bees pollinate billions of dollars of food crops each year—about one third of all food on a dinner table. Bees also pollinate trees, shrubs, flowers and plants in quickly shrinking natural habitats worldwide. Awareness about bees in the media depends upon a dramatic instance like the migration of the so called 'killer bee.' Sensational stories do await the inquisitive observer who has an interest in man's long relationship with the honeybee.

A single significant discovery about the honeybee in 1851 makes managing bee colonies for honey a profitable undertaking. Lorenzo Langstroth discovered that a space larger than 3/8 of an inch was filled with comb and a smaller space was

filled with propolis. Between combs the bees always left 3/8 of an inch clearance. Langstroth based the design of his movable frame hive on the bee space. Today, almost all honey producers in the US use a hive derived from the original Langstroth model. Most often made of wood, the hive is divided into easily movable components. A honey storage area is separate from the brood rearing area by restricting the queen bee's movements.

A novice beekeeper is best advised to purchase bees from local beekeepers gaining assurance available from certified state sources. Bee colonies must be kept in equipment that permits a thorough examination of each brood to determine the presence of disease. Under the WV Department of Agriculture, the state apiarist inspects all hives for contagious conditions and general health.

Working with bees requires knowledge of the life cycle of each individual colony and the cycle of surrounding nectar producing plants. The earliest honey flows in WV begin in late May. The latest end in late October. Apiary law in West Virginia, Article 13 states: "It shall be unlawful for any person to spray fruit trees while in full bloom with any material which is deemed by the commissioner to be injurious to bees."

Watching the activities of the bees is the first priority of a responsible bee-

keeper. Swarming—an instinctive act that may be a response to internal or external events, and supercedure or queen replacement, may be easily observed in the movable comb hives. Sometimes supercedure and swarming are combined.

Visible evidence of swarming is seen in the distinctive peanut shape of the cells that will develop into queens. Supercedure cells are generally smaller and located in a different portion of the comb. Supercedure begins when the bees notice the queen is not laying enough eggs due to age or injury. The preparation for the new queen takes only a few days. Many of the bees may swarm when the new queen takes her mating flight.

A colony swarms when fifty percent or more of the bees leave with the queen. The bees that remain in the hive are the nurse bees, a few field bees and many queen cells. Population imbalances occur when too many young bees exist in a colony for the number of field bees. Crowding is the most common cause of swarming and the congestion usually occurs just before the main honey flows in the area. Ideally, colony development and maximum brood rearing coincide at peak nectar flow, all bee efforts will be directed toward working the nectar into honey stores. Many techniques exist to provide maximum colony comfort, preventing swarming conditions from developing. Important factors include adequate

ventilation in hot weather and ample space for both brood and honey.

The type of honey depends on where the bees gathered the nectar. Most people prefer light honey although different types are becoming more accepted. Some parts of West Virginia have three major honey flows. The tulip popular is the first source of nectar followed by basswood and then sourwood. To the bees, the source of nectar is not crucial enough to merit special separation. Nectars from different sources may be mixed in cells if the cell needs to be filled. Only full cells are capped by the bees.

Once winter weather begins the bees form a tight cluster and stay inside the hive. They eat stored honey. A winter's supply for a typical healthy colony is about 60 pounds.

Much of the scientific discoveries about bee behavior like the bee dance and their ability to see infrared colors requires sophisticated equipment and specially designed hives. A traditionally designed hive and powers of observation are adequate to understand the life cycle of the hive and the honeybee's relationship to the environment. Appreciation of this interrelationship shows the honeybee to be a provider that sustains our way of life.

(continued from page four)

want full sun. Some prefer a slightly acid or neutral soil. Others do best in strongly acid ones. Some should have high soil fertility; others do well in poor soil.

The central problem of soil management in gardens is to develop and maintain a proper relationship between each plant and the immediate soil in which it grows.

Aside from pure luck, the gardener's success depends upon knowing two sets of factors: The requirements of the different plants he can grow and the characteristics of the soils in his garden.

Some plant can be found for almost any kind of soil as it is. And almost any kind of soil can be modified by management to grow any climatically adapted plant if one is willing to go to the trouble. Most successful gardeners try to find satisfying combinations of plants that require a minimum of soil change for good growth. Yet others go to a lot of trouble to change their soils to make them suitable for particular plants they want to have in their gardens. Some may even make drastic changes in a soil already about ideal for azaleas to have one suitable for roses, or the other way around.

One could hardly overemphasize the critical relationship between a plant and the soil in which it grows. Admiration of a plant in the catalog, at the flower show, or in a friend's garden is not enough of a basis for deciding to put it in our own garden, unless we know that its requirements can be satisfied by our garden soil as it is or as we can change it.

Gardening is an art, and many home gardens are outdoor living rooms. No one can say what is practical for home gardeners in general. Some are satisfied with almost any kind of green and growing things as long as the soil is neatly covered and the plants look healthy—a

sensible goal for persons with only a mild interest in gardening.

A large money budget is not necessary for a good garden, even on poor soil. Far more important is the work budget—the care and attention the garden will be given throughout the season, not simply during a short spring bustle that is followed by neglect in summer and autumn.

The place for the garden is normally near the house. Even the kitchen garden is best there unless the soil in some distant place is a great deal better for vegetables and fruits. Near the house there is time to do the little things, before a pest, a drought, or a nutrient deficiency becomes serious. The watchful eye of the gardener is the best fertilizer for his garden.

To begin a garden, we need to know several things about our own place:

The basic soil conditions; the air drainage and frostiness; the water supply we can count on, both natural and artificial; the light that falls on the plants during the seasons; and the protection required against hazards of wind, tree roots, and animals.

To learn about the soils we must dig—not simply into the surface, but down to about 3 feet or even more, if deep hardpans or other barriers to roots and water are suspected. The lower layers of soil control the supplies of nutrients, air, and water for deep roots. The movement of water out of the surface soil itself depends upon permeable layers beneath.

Most soils consist of a series of definite layers, or horizons, one above the other, with different colors and other properties. The horizons collectively are called the soil profile. Very young soils may not have horizons. Examples include those in the flood plains along streams, recent sand dunes, or new soil made by earthfills. If the gardener digs into an ordinary upland

soil and finds no regular horizons, he can be reasonably certain that the soil has been moved about and mixed up not long before.

The main things to look for are depth, texture, structure, color, drainage, the slope and exposure, acidity, nutrients, and contamination.

Water should be available for all of the garden except the parts that have only naturalized wild plants entirely adapted to the natural soil. A dependable source of irrigation water is essential in dry regions. Even in humid regions, short periods of drought cause damage that nullifies much of the benefit from other good practices.

Organic matter is a vital material of which most gardeners rarely have enough.

Organic matter has several functions in the garden soils—as food for micro-organisms and tiny animals within the soil, as a source of plant nutrients, and as a mulch. It also improves soil structure.

Its promotion of granular structure aids root growth and the entrance of water and air into the soil, reduces crusting and losses of surface soil by blowing or washing, and increases the ability of the soil to hold both water and nutrients for use by plants. Mulches help to control temperature, to reduce evaporation losses, and to suppress weeds. (Mulches of coarse sand and small stones have some of the same effects, too.) Organic matter, especially manure or compost derived from a wide range of normally growing plants, furnishes the growing plants a balanced supply of slowly available nutrients, including the trace elements.

The living roots, micro-organisms, and small creatures, such as earthworms, are a part of the total organic matter in the soil. Besides them, the garden soil contains three general classes of organic matter—the fresh

remains of plants, partly decomposed materials, and the more or less stable, dark-colored humus, which is slowly decomposed to water, carbon dioxide, and ash. During the decomposition of fresh materials, a vast number of intermediate organic compounds appear before the formation of humus. Some of them are toxic in large amounts, but in normally well-drained soils they are transitory, and are themselves decomposed so soon that large amounts are never present. This decomposition is carried out by the tiny animals and the micro-organisms. The organic matter furnishes them food for growth and the nutrients in it are thereby released for use by plants.

The fresh materials vary widely in their rates of decomposition and in the amounts of plant nutrients they release, especially the amounts of nitrogen.

Sawdust and wood chips decompose very slowly and furnish negligible amounts of plant nutrients to the soil. Because they decompose slowly they are good mulches, especially in warm, moist regions. Dry straw, tree leaves, and sawdust actually reduce the nitrogen available to plants when first added to the soil.

Among the partly decomposed materials, animal manure is important. Nearly pure manure is also a kind of fertilizer; often it is dried and sold in bags. It decomposes rapidly and gives the soil a balanced supply of plant nutrients. Manure that has much dry straw and wood chips with it decomposes more slowly.

Leaf mold, the partially decomposed leaves just above the mineral soil in the woods, is an excellent material, especially for mulching acid-loving plants. It decomposes slowly and furnishes some nutrients. Most peats decompose slowly and furnish minor supplies of nutrients.

From Yearbook of Agriculture 1957

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Road construction alters the hydrology of watersheds through changes in water quantity and quality, stream channel morphology, and ground water levels. Paved roads increase the amount of impervious surface in a watershed, resulting in substantial increases in peak runoff and storm discharges. That usually means flooding downstream. Reduced evapotranspiration within road rights-of-way may also result in increased runoff and streamflows. However, increases in streamflows in forested watersheds are not usually significant unless 15% or more of the forest cover is removed by road construction and associated activities such as logging.

When a road bed is raised above the surrounding land surface, as is normally the case, it will act as a dam and alter surface sheet flow patterns, restricting the amount of water reaching downstream areas. Mike Duever and co-workers found this to be a significant problem in the Big Cypress-Everglades Ecosystem of south Florida. Ditches dug for road drainage often drain adjacent wetlands as well. The US Fish and Wildlife Service, in 1962, estimated that 99,292 acres of wetlands in western Minnesota had been drained as a result of highway construction. This drainage occurred at a rate of 2.33, 2.62, and 4.10 acres of wetland per mile of road

for state and federal, county, and township highways, respectively.

Roads concentrate surface water flows, which in turn increases erosion. Megahan and Kidd, in 1972, found that erosion from logging roads in Idaho was 220 times greater than erosion from undisturbed sites. Logging roads used by more than 16 trucks per day may produce 130 times more sediment than do roads used only by passenger cars. Incision of a slope by roadcuts in mountainous areas may intercept subsurface flow zones, converting subsurface flow to surface slow and increasing streamflow rates. Water tables are almost always lowered in the vicinity of a road.

Where a road crosses a stream, engineers usually divert, channelize, or otherwise alter the stream channel. Culverts and bridges alter flow patterns and can restrict passage of fish. Channelization removes natural diverse substrate materials, increases sediment loads, creates a shifting bedload inimical to bottom-dwelling organisms, simplifies current patterns, lowers the stream channel and drains adjacent wetlands, reduces the stability of banks, and exacerbates downstream flooding.

The impacts of roads on fish and fisheries have long concerned bi-

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ologists. Increased erosion of terrestrial surfaces almost inevitably results in increased sedimentation of streams and other water bodies. Even the best designed roads produce sediment, and unpaved roads continue to produce sediment for as long as they remain unvegetated. A divided highway requiring exposure of 10 to 35 acres per mile during construction produces as much as 3000 tons of sediment per mile. In a study of the Scott Run Basin in Virginia, Guy and Ferguson found that highway construction contributed 85% of the sediment within the basin. The yield was 10 times that normally expected from cultivated land, 200 times that from grasslands, and 2000 times that from forest land. Studies in northwestern California show that about 40% of total sediment is derived from roads and 60% from logged areas. Much of the sedimentation associated with roads occurs during mass movements (i.e., landslides) rather than chronic surface erosion. Roads dramatically increase the frequency of landslides and debris flows. Studies in Oregon have found that roads trigger up to 130 times more debris torrents than intact forest.

Increased sediment loads in streams have been implicated in fish declines in many areas. A 1959

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study on a Montana stream, reported by Leedy in 1975, found a 94% reduction in numbers and weight in large game fish due to sedimentation from roads. Salmonids are especially vulnerable to sedimentation because they lay their eggs in gravel and small rubble with water flow sufficient to maintain oxygen supply. Fine sediments may cement spawning gravels. Increases in fine sediments also reduce the availability of oxygen to eggs and increase embryo mortality. Stowell and co-workers reported that deposition of 25% fine sediments in spawning rubble or gravel reduces fry emergence by 50%. Sedimentation also has negative effects on the invertebrate food supply of many fish. Furthermore, destruction of riparian vegetation by road construction results in higher water temperatures, which reduces dissolved oxygen concentrations and increases fish oxygen demands (a "double whammy"). If the fishing public was adequately informed of the negative effects of roads on fisheries, perhaps all but the laziest would demand that most roads on public lands be closed and revegetated!

From Killing Roads, A Citizen's Primer on the Effects & Removal of Roads, Earth First! Journal.

What Do You See In A Tree

Just about any description of degraded land is a description of what the earth experiences without trees and green plants. Flooding, waterlogging, increased risk of drought, each may be a reaction to loss of vegetation that keeps hillsides intact, topsoil from eroding, leaching and loss of minerals and nutrients.

Appreciation for the contribution that trees and vegetation provide has been a focal point of activities and programs of the American Forestry Association (AFA) since their founding in 1875. Members include professional foresters, arborists, business people, lawyers, educators, researchers and administrators. Publications and projects established to promote conservation of trees and other resources examines the significance and obstacles faced by trees in a natural setting and in the city.

The Global ReLeaf project is concerned with reforesting land. The Famous and Historic Trees project collects and plants seeds of trees that witnessed historic events in the American Revolution and the founding in the US of A. The National Register of Big Trees encourages preservation and identification of trees at the local level. In 1987, AFA surveyed tree conditions in 20 U.S. cities. The ReLeaf program was established as a response to the terrible discoveries documented by the survey.

The life cycle of the urban tree is very unlike the tree found in the forest. The urban tree is site specific. The forest tree never stands alone. The urban tree is valued for the shade it provides. The forest tree is valued for its position in the canopy. The urban tree can improve air quality. The forest tree can prevent the destruction of the ozone layer. The urban tree can effect stormwater flows. The forest tree can influence watershed

flows. The urban tree can cool temperatures. The forest tree can prevent global warming.

Although it is easier to attempt to hug one individual tree than to hug a forest, most tree huggers work in the forest. Ordinances to protect the urban tree are increasing. Planners and designers place more value on ecological principles that provide for the pocketbook, the community and nature.

The pre-Columbian period of tree growth in North America was an ocean to ocean forest of undisturbed native tree species. An occasional clearing to plant corn was the only man-made disturbance before Columbus. Trees remaining need shelter in the form of laws to give the shelter we often take for granted.

DEFINING TREES

The Department of Agriculture lists all recognized trees in the United States in *Checklist of United States Trees*. The scientific cataloging of trees identifies native and naturalized trees in 748 species, 244 genera, and 76 plant families. The broadest definition of a tree is applied in arriving at these totals. There is no uniform definition of a tree. Only gradually do trees and shrubs distinguish themselves. The *Checklist* defines trees as woody plants having one erect perennial stem or trunk at least three (3) inches (7.5 centimeters) in diameter at breast height (4½ feet or 1.3 meters), a more or less definitely formed crown of foliage, and a height of at least 13 feet (4 meters).

The terms native, introduced, naturalized, provide important information about a tree. Where it originated, how it fared, this is valuable information for selecting a tree for the city, understanding a forest or appreciating nature. Introduced species are labeled

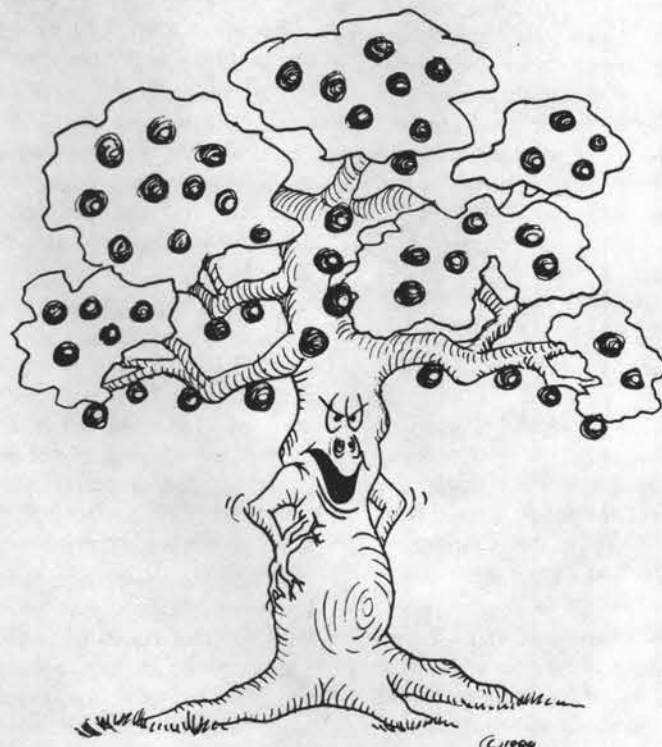
foreign or exotic and have been brought to an area by humans. The intent of the humans may be intentional, for planting or accidental. Individual trees may persist after cultivation or if they are abandoned. The spread of an introduced species from the area of introduction creates a designation of 'escaped.' Escaped species become known as naturalized. They are established as if wild to the area and spread by reproducing naturally.

George B. Sudworth (1864-1927) compiled the first reference list of the native trees in the United States entitled *Nomenclature of the Arborecent Flora of the United States* as part of the dendrology project he directed

in Washington from 1886 until his death. Nomenclature revisions necessitated another list. In 1930, the "American Code" was consolidated with the International Code of Botanical Nomenclature. This work resulted in the precursor of the *Checklist* used today. Today's *Checklist* follows the International Code of Botanical Nomenclature (ICBN). An international congress of plant taxonomists and systematic botanists adopted and revised these rules.

For information about joining the AFA or its programs, write

American Forestry Association
P. O. Box 2000
Washington, D. C. 20013



AND WHY SHOULD I WORK TO SUPPORT YOU!

Leaf Power

When the first waves of pale-green leaves spread through the valleys and begin to climb the mountains, you know the real spring—as opposed to the calendar spring—has arrived.

Billions of new leaves are unfolding on trees and other plants as the new season advances northward and rises from the river flood plains to the surrounding hills.

These leaves are miniature power stations which use solar energy to turn packaged sunlight into new growth.

The leaf is a remarkable machine, which long ago perfected the skill of capturing energy from the sun—something human beings are still struggling to learn.

Although a leaf may seem simple, it has elaborate mechanisms which enable it to provide energy for the tree or other plant it serves.

While leaves vary tremendously in size and shape, the basic leaf is generally flat so it can present the most surface and least volume to receive maximum light without any waste of cells. Evergreen needles are a more primitive form of leaf but they package sunlight in the same way that broad leaves do.

The great invention of the plant kingdom is chlorophyll, a pigment which can absorb the sun's energy to combine water and carbon dioxide and produce sugar in the form of glucose.

This production process is called photosynthesis.

Each leaf has an elaborate plumbing system. Where the leaf is joined to a branch or twig it has vascular bundles, tiny pipelines. Through these pipelines the leaves can draw water and minerals in from the roots of the tree and send packages of freshly made energy sugar out to the rest of the plant.

In the leaf itself the vascular bundles branch into veins, which serve as the leaf's irrigation system. On the bottom of each leaf are the stomata (mouths) which serve as pores to let water in or out. They also control the intake of carbon dioxide.

Leaves have an impact on their environment because they discharge oxygen while manufacturing glucose and also give off carbon dioxide at night when the leaf factory is closed. Also emitted from leaves are hydrocarbons. The amount of this type of discharge is determined by plant species, light, temperature and other factors influencing the plant energy balance.

These plant-produced hydrocarbons can react with nitrogen oxides to produce ozone, a key pollutant in smog, in the same way as hydrocarbons emitted from auto traffic and other human activities.

EPA's Environmental Research Laboratory at Corvallis, Ore., has been studying the emission of hydrocarbons from plants. Scientists at this installation will also investigate the role of plants as air purifiers as well as polluters.

Some industry representatives have seized on the fact that plants can emit hydrocarbons to argue that Mother Nature is the real polluter of this country's air.

In response to these statements, David G. Hawkins, EPA's Assistant Administrator for Air, stated recently that "hydrocarbons from vegetation are dispersed over broad areas so their concentrations in urban-suburban areas are trivial compared to hydrocarbons" released by human activities.

"No doubt," Hawkins said, "there are some rural ozone readings dominated by natural phenomena but the evidence simply will not support the claim that nature is a significant contributor to smog in our cities."

In any case, it is green leaves that support civilization everywhere in the world. The evolution of animals could not have occurred without that of the plants before them.

"All flesh is as grass," says the Bible, "and all the glory of man as the flower of grass. The grass withereth, and the flower thereof falleth away."

Not only is life fleeting but while it lasts it is utterly dependent on plants.—C.D.P.

Environmental Almanac, 1989

LOCAL—REGIONAL—NATIONAL Alternative Public Lands Plans by Earth First!

Earth First! is organizing local, regional and national protests of present forest service policies on October 22, October 29 and November 5, 1990. Advocates for ecologically based comprehensive plans and protection of wilderness areas, Appalachian Earth First! contact Ernie Reed is calling for citizen participation in all of the events.

Coordination with other chapters is designed to make news nationwide. The Monday, October 22 event is scheduled for every National Forest at the Forest Supervisor's Office. An alternative plan for forest management will be presented along with a list of grievances. The plan will highlight the worst practices by proposing tactics for managing public lands and wilderness by applying ecological concepts. Many current practices will be exposed in the grievance list as irresponsible stewardship that overvalues traditionally recognized commodity measurements and discounts many scientific and aesthetic values.

Organizers encourage participants to communicate their own ideas and comments by creative banners, demonstrations, guerilla theater and any direct non-violent action. Media attention to the outrage against present destructive policies is viewed as an ingredient to the success of the local level event.

All local alternative plans will be submitted to regional offices across the nation on Monday, October 29. Earth First! spokesman Ernie Reed emphasizes that numbers and creative communication of their message will be an important part of the primary goal: presenting each forest plan from every region to the regional supervisors.

The final day, Monday, November 5, culminates the activities of the local and regional demonstrations at the office of F. Dale Robertson, Washington, D. C. The alternative plans will be delivered along with the message that current management practices are inadequate and dangerous.

Monongahela National Forest is in Barbour, Grant, Greenbrier, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, Webster counties. The Forest Supervisor's Office can be reached at (304) 636-1800, P. O. Box 1548, Sycamore Street, Elkins, West Virginia 26241. East Coal Contact Regions 7, 8 and 9, Ernie Reed, can be reached at (804) 361-9036, P. O. Box 309, Nellysford, Virginia 22958.

WV Soil and Water Conservation

The forty-ninth annual meeting of the **West Virginia Soil and Water Conservation District Supervisor's Association** will be held on November 7-8 at Jackson's Mill. The theme is *Water Quality—Conservation—And You*. Keynote Speaker is Ernest Shea, the Executive Director of the National Association of Conservation Districts. Highlights of the conference will be: presentations on various aspects of water quality, an update on *Erosion & Sediment Control Legislation* by David Grubb, announcement of the State Conservation Farm winners, presentations by the WV Conservation Educator and Soil Conservation District Speech Winners, Auxiliary Auction, and the soil and water conservation awards banquet. The registration fee is \$6.00. Persons interested in soil and water conservation are invited to attend.

A *Solid Waste Utilization* conference will be held at Jackson's Mill on Friday, November 9 by the *West Virginia Chapter of the Soil and Water Conservation Society* and the *West Virginia Resource Conservation and Development Association*. The program will include the following topics: *Solid Waste, Water Quality and the Environment, Water Quality, Legal Aspects of Solid Waste Disposal and Utilization, and Solid Waste Utilization Technology*. Gary Boothe of Owens-Brockway will entertain participants with *The Magic of Recycling* after the awards luncheon. Speakers will represent environmental groups, government agencies, and private industry. The cost of the meeting (including the luncheon) will be about \$20.00. The public is encouraged to attend.

Additional information on both meetings may be obtained by contacting Peg Reese, WV State Soil Conservation Committee, Guthrie Center, Charleston, WV 25305, (304) 348-2204.

The Apple/Earth Demonstration

The soil is one of the most important natural resources on the face of the earth. All living things depend on it, either directly or indirectly, for their food.

Few realize how little land must be utilized to feed the world. The following demonstration is designed to illustrate the small portion of earth capable of food production and emphasize the importance that rests on each generation to use the soil wisely.

Materials: Large apple (the softer ones work better) and a paring knife (or heavy plastic knife)

Procedures: 1) Cut the apple into four equal parts. Three parts represent the oceans of the world. The fourth represents the land area.

2) Cut the land section in half lengthwise. Now you have two one-eighth pieces. One section represents the deserts, swamps, mountainous, arctic and antarctic regions of the world. The other one-eighth section represents land where man can live but cannot grow food.

3) Slice this one-eighth section crosswise into four equal parts. Three of these one thirty-second sections represent the areas of the world which are either so rocky, wet and hot, or contain soil so poor that food production is not possible. This also includes areas which have been developed.

4) Carefully peel the last one thirty-second section. This small bit of peeling represents the soil of our earth on which all of mankind depends for food production!

From Oklahoma Conservation Education

The Apple/Earth Demonstration

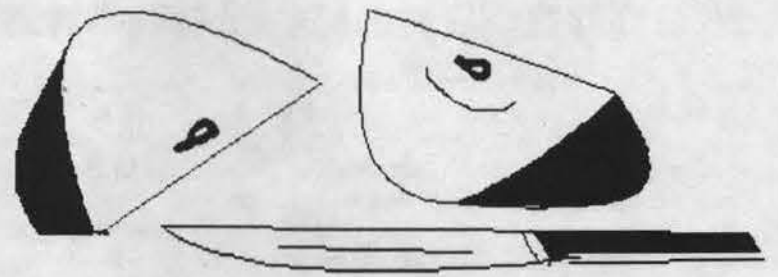


illustration: JM

Potomac Highland Bureau Wants DOT to Stop Using Herbicides Along Roads

Citing deterioration of the state's natural beauty as well as the creation of possible long-term threats to the environment, the Potomac Highland Convention and Visitors' Bureau has urged the West Virginia Department of Transportation to stop using herbicides to kill unwanted vegetation.

"The bureau requests the Department of Transportation to resume traditional cutting methods of all highway right-of-way foliage along roads, guardrails and bridges and discontinue its use of chemicals for this purpose," said PHCVB president Charles Hankinson who with PHCVB office manager Ada Kirkpatrick has written a letter of complaint to DOT Commissioner Fred Van Kirk concerning the issue.

"At its July meeting, the PHCVB members cited the unspoiled beauty of the Potomac Highlands as its number one asset for tourism," Hankinson said, "The bureau also noted the destruction of roadside greenery, erosion and unknown long-range hazards to streams and ground water as factors in seeking the ban on the current chemical defoliation program by the state of West Virginia."

"We have requested that the Department of Transportation start reseeding areas where the greatest damage has occurred and to start seeding perennial native wildflowers along road banks as is the current practice in North Carolina," Hankinson said.

The PHCVB leader noted highway spraying is displacing native grasses and other foliage along scenic U.S. Route 33 eastward from Elkins through the Allegheny Mountains.

"The Canaan Valley and Seneca Rocks areas, as well as numerous other sites throughout the 13-county region, are experiencing unsightly spraying which is often done in the spring and fall so that the public is not immediately aware of its damages and ugliness.

"The PHCVB would again like to see the green foliage and beautiful native flowers along the roadsides greeting our visitors and residents instead of brown, scorched earth and erosion which now appear along some of our beautiful and celebrated country roads," he said.

Harmon area resident Michael Snyder, a member of the PHCVB and a teacher in Elkins, stated he believes that "If too many more seasons of spraying go by, we'll have sterile earth.

"Nobody knows the long-term effects of spraying herbicides," Snyder said. "Even Agent Orange used in Vietnam was at one time thought to be safe. Plant roots in a thick mat hold the earth together, and instead of being trimmed plants are being sprayed with a chemical that kills the whole plant."

He noted even crown vetch, a plant planted on hillsides and roadways by the DOT for erosion control, has been killed by DOT spraying. "In some places native grasses such as orchard grass are eradicated, and plants such as jewel weed which has a weaker root system may grow back in its place. Banks around guardrails may become unstabilized.

"What long-range effect will it have on the whole web of life?" he asked.

Referring to "Take Me Home Country Roads," a song about West Virginia popularized in the 1970s by John Denver, Snyder commented that through the use of defoliants the country roads now "look like heck."

Alvin Hammonds, regional maintenance engineer for the West Virginia Department of Transportation in Charleston, stated that as a result of statewide cutbacks, 50 percent cut in highways division work forces have necessitated the use of plant spraying instead of cutting.

"The maximum a few years ago was 10,000 people in the highway department, plus several hundred workers from the Department of Human Services' Aid to Families with Dependent Children and Unemployed Father program," Hammonds said. "Now we have 5,000 highway division workers and no one provided by DHS."

"It's a tough time manning equipment, and if you have an equipment operator out cutting brush, you don't have someone operating equipment," he said.

According to Kirkpatrick, copies of the letter to Van Kirk were sent by the PHCVB to Gov. Gaston Caperton, West Virginia Department of Natural Resources executive director Ed. Hamrick, Department of Transportation secretary Arch Gleason and West Virginia tourism and Parks commissioner John Brown.

The letter was also forwarded to several agencies and corporations including the Environmental Protection Agency in Wheeling and in Philadelphia, Pa., the U. S. Forest Service, Agriculture Stabilization and Conservation Service, Monongahela Power Company, West Virginia Energy Center, Potomac Edison, Soil Conservation Service, Project PAL (Pride Against Litter).

Kirkpatrick stated Congressional representatives plus State Senate and House of Delegate members from the 13-county area were contacted concerning the spraying.

The Potomac Highland Convention and Visitors' Bureau serves Randolph, Pocahontas, Pendleton, Hardy, Grant, Webster, Tucker, Hampshire, Jefferson, Berkeley, Morgan, Mineral and Greenbrier counties.

From THE INTER-MOUNTAIN 8-17-90

Reasons To Join WVHC

The West Virginia Highlands Conservancy is a private, non-profit environmental organization started in 1967. Its objectives are "to promote, encourage, and work for the conservation—including both preservation and wise use—and appreciation of the scenic, historic, open space, wilderness, and outdoor recreation resources of and related to West Virginia, and especially the Highlands Region . . ."

Members include people and organizations diverse in their personal interests and professions but united by a common interest. Most WVHC members are West Virginians but many live outside the state.

The Highlands Voice, a monthly 8-page

newspaper, is sent to all Conservancy members. It is filled with environmental news on topics of interest and concern to members as well as articles about trips and outings.

The Conservancy sponsors two special weekends each year. These are usually at some scenic spot in the highlands and feature speakers, outings and board meetings.

Your contribution to WVHC is tax deductible and joining is as simple as filling out this form and returning it to the office in Charleston.

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The West Virginia Highlands Conservancy is a non-profit organization. Your contribution is tax-deductible. Please keep this for your records.

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Edition 5 of the WVHC **Monongahela National Forest Hiking Guide** is now available. This edition is bigger and better than ever, with 320 pages, 60 maps, 39 photographs, descriptions of 164 trails totalling 780 miles, a new section on ski-touring, and a full-color cover. The authors are Allen de Hart and Bruce Sundquist. Allen has hiked all the trails of the Monogahela N.F. over the past few years. Bruce edited Editions 1-4. The hiking community and the U.S. Forest Service provided the authors with trail reports and photographs.

In the U.S. Forest Service's planning process that led to the 1986 Land and Resource Management Plan, over 35,000 comments were received from the public. The gist of these comments is that the Monogahela is a "Special Place." And indeed it is. The hiking and backpacking opportunities it provides are among the best in the eastern U.S. The more outstanding areas are becoming known far and wide — Otter Creek Wilderness, Dolly Sods Wilderness, Flatrock Plains, Roaring Plains, Blackwater Canyon, Spruce Knob, North Fork Mountain, Shaver's Mountain, Laurel Fork Wilderness,

Cranberry Back Country, Cranberry Wilderness, among others. This guide will help you get to know these and other special places in the forest.

Profits from the sale of these guides support a wide variety of worthy environmental projects in the West Virginia Highlands Conservancy.

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