THE HIGHLANDS VOICE

Published monthly by the W.Va. Highlands Conservancy

VOL. 22, NO. 9, SEPTEMBER 1989

OPPOSITION CAN'T STOP BOMB RUNS OVER STATE

By Leigh Ann Eagleston
The Pittsburgh Press 8-18-89

Despite public outcry against a military proposal to increase bombing practice at a Pennsylvania military site, the Air Force hasn't scrapped the plan.

The flights would increase the amount of air traffic over 11 state parks, 10 state forests and about 16 designated wild or natural areas.

The proposal targeting Fort Indiantown Gap 18 miles east of Harrisburg has drawn opposition from the governor's office, U. S. senators and environmentalists because of the amount of area covered by the flights and their frequency and low altitude.

Pennsylvania's Republican Sens. John Heinz and Arlen Specter, Gov. Robert Casey and such organizations as the Sierra Club have expressed concern.

Opposition to plans outlined in the draft environmental assessment, dated June 23 and released by the Strategic Air Command, hasn't convinced the Air Force to do a more detailed environmental impact study, said SAC spokesman Alan Gregory.

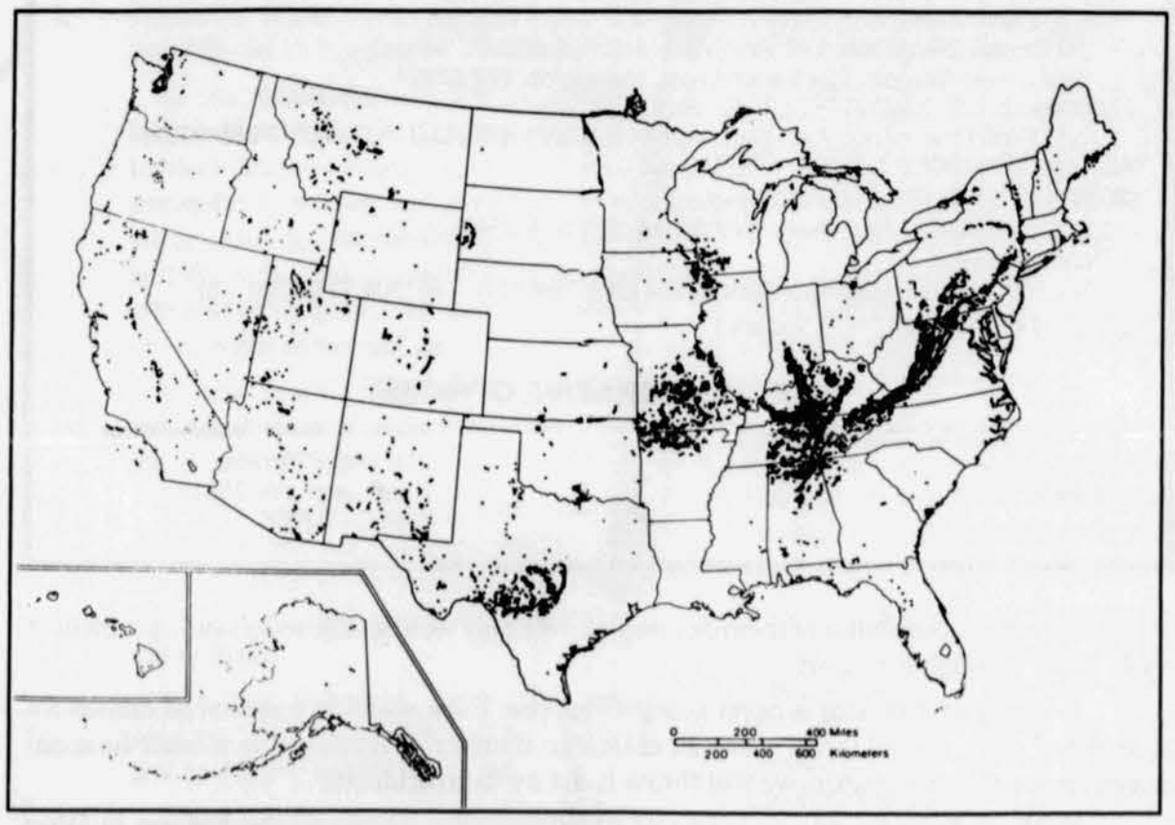
He emphasized that no decisions have been made regarding the proposal's feasibility.

In a similar battle, a three-day military flight exercise over the Dolly Sods wilderness area near Elkins, W. Va., drew criticism last August, but was approved by the Federal Aviation Administration.

The Fort Indiantown Gap range now plays host to about 120 practice bombing sorties a month by the Air National Guard, but these flights involve smaller planes and less area than the SAC runs would. In the new proposal, FB-111 fighter jets would drop fake bombs, 500-pound blocks of cement, on the range.

The SAC proposal would add 82 sorties per month by jets based at Plattsburgh, N. Y., and Pease, N. H., air bases. It would cover 279 miles of Pennsylvania at altitudes between 400 and 1,000 feet.

The access route runs west, starting near Wilkes-Barre, going around the Allegheny Reservoir in Warren County at the New York border, then back to the Gap.



Cavern areas in the United States.

There are about 17,000 known caves in the United States. They occur in every State except Rhode Island and Louisiana. About 125 caves have been opened to the public for study and enjoyment. Of these, 15 are in national parks or monuments, and 30 are in State parks. The remainder are privately owned and operated. Most of these caves are in the Appalachian Mountains, the Ozark Mountains, the Black Hills, and the limestone regions of Kentucky, Tennessee, and Indiana.

A Marine Base *Within* The Mon National Forest?!

by Mary Wimmer, WV Sierra Club

Northeast of the Cranberry Wilderness Area and directly west of Mace and Mingo on Rt. 219 is a privately-owned track of about 13,000 acres of remote mountainous land. This land is within the "Proclamation Boundary" of the Monongahela National Forest, established in the early 1900's to protect the watersheds of several major eastern river systems through re-vegetation and proper land management. Our MNF Proclamation Boundary covers approx. 1.6 million acres of land (the solid green area on a WV state map); at present, the publically-owned portion of that is just over 1 million acres.

Senator Robert Byrd is looking for an area to establish a Marine training base in West Virginia (curious, considering that bases are being shut down all over the country to stop waste of our tax dollars). One piece of land being seriously looked at is the 13,000 acres mentioned above. In fact, the Marines with their disruptive helicopters, vehicles, etc. were there just a couple weeks ago to look the place over during a training exercise, and a number of concerned people have already contacted me.

Within a 12 mile radius of the area the Marines are interested in are: Cranberry Wilderness Area; 4 of our Semiprimitive (6.2) Areas (Tea Creek/Turkey Mountain, Little Mountain, and Peters Mountain); the Shavers Fork headwaters remote habitat area; the Elk River Touring Center (skiing and mountain biking, bed and breakfast, restaurant); Bald Knob, and Cass Scenic Railroad State Park; Snowshoe and Silver Creek Ski Areas; and Kumbrabow State Forest. What happens economically to West Virginia when these popular, expanding outdoor recreational areas and tourist attractions suffer because users of the area DO NOT WANT to hear military helicopters or run into military vehicles or maneuvers or soldiers-in-training any time of the day or night during their stay?

It is important that we let Senator Byrd know that TURNING OVER ANY LAND WITHIN THE PROCLAMATION BOUNDARY OF THE MONONGAHELA NATIONAL FOREST TO THE DEPARTMENT OF DEFENSE IS NOT ACCEPTABLE! (It is important to say "proclamation boundary," and not just MNF because the latter is often understood to mean only the federally-owned area.) Please take a few minutes to jot him a note relaying this (U.S. Senate, Washington 20510) or call him at 202-224-3954. Also, strongly encourage him to bring this 13,000 acres under Forest Service ownership as it should be, and to thereby develop its uses consistent with our Forest Plan, largely remote wildlife habitat and semiprimitive recreation. Thank you for the small amount of time it will take you to write.

World Wildlife Fund Founder Scott Dies

LONDON (UPI) — Peter Scott, the British conservationist and ornithologist who founded the World Wildlife Fund, died Tuesday night after a heart attack. He was 79.

The founder of the World Wildlife Fund and the Wildlife Trust bird sanctuary in Slimbridge, Gloucestershire, Scott also wrote 18 books and illustrated 20 others.

Scott was 2 years old when his father, Capt. Robert Falcon Scott, died exploring the Antarctic.

David Trippier, a member of Parliament and the environment and countryside minister paid tribute to Scott.

"He was honored in many countries, but probably his most lasting contribution will be remembered as the awakening of interest in the role which waterfowl and wetlands play in the complex ecology of this planet Earth," Trippier said. "He will be sadly missed by all who knew him," he said.

— Gazette 8-31-89

WITCH HAZEL

One of the few plants that can be classified as a true autumn-bloomer is the witch hazel. It is a shrub or small tree up to 25 feet high. It produces bright yellow flowers as a surprise in October, when the leaves are falling and most plants seem to be winding up their season's work. Presumably the "witch" part of the name refers to the use as a water divining rod. A lotion is made from the distillation of the bark.

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OCTOBER: ENERGY AWARENESS

The Department of Energy's theme for Energy Awareness Month is "Energy Builds a Better America." Thirty-three federal agencies and private organizations compose the steering committee. Artwork for a logo or a poster is available for interested groups. Direct requests to Bonnie Winsett, Office of Public Affairs, CP-24, MS, 1E-200 Forrestal, US Department of Energy, Washington, DC 20585. Telephone (202) 586-6827.

FROM THE HEART OF THE MOUNTAINS

— One More Step —

by Cindy Rank

The settlement agreement signed July 17, 1989 carried us one step further in the litigation process begun December 12, 1988 when the Conservancy and 14 other citizen and environmental groups sued the WV Department of Energy (DOE) for failure to perform mandatory duties and to correct a systemic breakdown in enforcement of the approved state surface mining regulatory program in the State of West Virginia.

Together with other regulatory changes brought about during the 1989 Legislative Session, this agreement further strengthens DOE Regulatory and Administrative Policy with regard to Hydrologic Studies prior to mining, Inactive Sites, Notices and Patterns of Violations, Cessation Orders, Civil Penalties, Review of Owners and Operators for Current Violations in other states, Coal Exploration and Department Resources.

Several substantive concerns of the lawsuit, such as Bonding, Excess Spoil, Fills and Mountaintop Removal (Track I issues), are left to be dealt with under a series of procedures and time frames which are set forth in an attachment to the settlement agreement.

In addition to these Track I issues, the DOE and citizen group plantiffs also agreed to address several unresolved issues from the negotiations surrounding the regulatory package during the legislative session following the same set of procedures.

All in all it has been a long haul, especially for our lawyers who have spent many hours and expended much energy during the see-saw like negotiations these past 8 months. Granted they will be reimbursed for some of this time, but as anyone knows who has been involved in this or similar endeavors, there is always a tremendous amount of personal sacrifice that goes into such an effort which can't be compensated for.

As President of the Conservancy, I would be remiss if I didn't thank Tom Galloway, Jim Lyon and Josh Barrett for spearheading this effort for us. The interest, time and personal energy they have contributed since the middle of last year is greatly appreciated.

Of course, even after the resolution of the remaining issues, all is not finished . . . What is the saying?: "The proof is in the pudding". We may have moved forward toward improving what's written on paper and what is said in words, but until the effects on the ground are felt on every hill and in every hollow of West Virginia, what we have achieved is merely words on paper.

IS RECYCLING FREE?

by John McFerrin

In a free market economy like ours, the free market can do some things well. Given money incentives, people will often do socially useful things not because those things are socially useful but because they are making money doing it.

Right now, the free market is eliminating drink cans from the streets of Charleston. The money from recycling is what makes that happen.

There are several men who spend their days roaming the streets of Charleston, picking cans from the streets, the riverbank, and anyplace else they can find them. They do it for the cans value when recycled. One man even has a shopping cart. I assume this came either from a TEDDI loan or an unintentional grant from a local supermarket.

While on one level it is sad that these men have so little prospect of regular work that they must do this sort of thing for a living, it does keep the streets clean. You hardly even see discarded cans on the streets of Charleston.

In other areas, the free market works less well or not at all. In the recycling of paper, the free market is breaking down because there is not enough demand for the recycled paper. There is no financial incentive for people to save newspapers because there is no money in it. Right now, you can barely give away used newspapers.

For recycling of paper, the free market needs a push. This push may come in the form of increased costs of disposing of it. Even if you get almost no money for used newspaper, if you were faced with the real (and rising) costs of disposing of it, then even giving it away would look good. Recycling companies may not pay much for paper but whatever they pay beats your having to pay a landfill to get rid of it.

The push for paper recycling may come from the expanding markets for that paper. State government is one of the biggest, if not the biggest, customers for paper in the state. Recently passed legislation requires this big customer to favor recycled paper products. Given this increase (and possibly others) in demand, recycling of newspapers might once again be something that somebody would like to do as a profit-making enterprise.

While the free market is working more or less well in encouraging recycling of metal and paper, there is one area where it is not working to the slighest degree and probably never will: styrofoam. Nobody will buy it; you can't give it away. There is nothing to do with it but bury it or burn it.

Of course, I have seen all the promotional material about how concerned McDonalds is with the environment and how they are working on recycling their styrofoam burger boxes. This is rubbish. They are recycling a tiny fraction of their enormous volume of trash. They are recycling just enough to be able to say with a straight face that they are recycling. More importantly, they are recycling just enough to head off any regulatory effort to ban styrofoam packaging.

From West Virginia's perspective, even if strofoam is being recycled somewhere, it is not being recycled here. As far as I know, one hundred percent of the styrofoam packaging used in this state ends up as trash.

The sensible solution to this problem is to simply ban styrofoam packaging. With the financial incentives for recycling of cans, there is a possibility of solving the problem of disposal of cans through recycling. Although the financial incentives for recycling paper are not as strong, there is the possibility of them developing. We may well be able to solve the problem of waste paper through recycling.

With styrofoam, that is never going to happen. Even with the financial incentives for recycling of cans, we still throw away an enormous number. With the more modest financial incentives for recycling paper, we still throw it out by the truckloads.

With no hope for any recycling of styrofoam even visible on the horizon in West Virginia, we can never hope to deal with this trash problem by recycling it. Since the stuff doesn't rot, the only choices are to ban it, burn it, or be stuck with it forever. Given those choices, banning it seems by far the most sensible.

Banning styrofoam is a simple, straightforward step that would help address the problem of trash disposal in West Virginia. It doesn't solve the entire trash problem but is a simple, effective step which takes us toward solving that problem—a direction in which everyone agrees we need to go.

Ozone-Thin Air Disperses, Scientists Say

By William K. Stevens

Air partly depleted of ozone appears to be transported from Antarctica to New Zealand and southern Australia by air currents in the atmosphere, scientists reported last week.

As is now well known, an ozone "hole," or region of depleted ozone, develops over Antarctica during the southern Hemisphere's spring. Ozone in the stratosphere protects the earth's inhabitants from ultraviolet radiation from the sun.

Scientists say the seasonal depletion over Antarctica is caused chiefly by the release of chlorofluorocarbons, chemicals in wide industrial use around the world. The hole disappears in late spring with the break-up of an atmospheric vortex, or circular air pattern, that sustains it.

Earlier, computer simulations of the atmosphere had suggested a "dilution effect" whereby some of the ozone-poor air moves away from Antarctica, toward more northerly latitudes, when the polar vortex breaks up. Now atmospheric scientists from Australia, New Zealand and the United States have found evidence that, they say, seems to confirm this.

The scientists are Roger J. Atkinson of the Bureau of Meterology in Melbourne; W. Andrew Matthews of the Physics and Engineering Laboratory at Lauder, New Zealand; Paul A. Newman of the Universities Space Research Association at the NASA/Goodard Space Flight Center in Greenbelt, Md.; and R. Alan Plumb of the Massachusetts Institute of Technology. Their finds were published last week in the British journal *Nature.*

Using data from probes carried aloft by balloons, and from ozone measurements taken by instruments aboard the Nimbus-7 remote-sensing satellite, they found that ozone levels above New Zealand and southern Australia were unusually low in December 1987. The Antarctic ozone hole was also breaking up then. Using meterorological analyses by the United States National Meterorological Center, the scientists concluded that some ozone-poor air had been carried northward from the edge of the decaying polar vortex.

When the air from the pole is fully dispersed, Dr. Newman said, its ozone might be depleted on the order of 5 percent, compared with 50 percent to more than 90 percent in the Antarctic hole.

8-1-89 New York Times

Big Car & Oil Producers Parley on Pollution Issues

By Patrick Lee
Los Angeles Times

While state and federal officials move ahead with clean-air proposals, leaders of the Big Three domestic automakers and several major oil companies have been quietly meeting on their own to form a task force to research and develop low-emission fuels and engines.

Top executives of General Motors Corp., Ford Motor Co., Chrysler Corp. and several oil companies last met July 20 in Detroit to discuss setting up a task force to look into ways to meet clean-air requirements proposed by the Bush administration, said Arthur E. Wiese, spokesman for the American Petroleum Institute in Washington.

In the meantime, lower-level officals of both industries also have talked about ways to meet clean-air targets. Auto and oil companies favor meeting such goals by reformulating gasoline and modifying existing auto systems rather than by resorting to the use of alternative fuels such as methanol, ethanol or compressed natural gas.

In July, Atlantic Richfield Co. announced the introduction of reformulated gasoline for use in pre-1975 cars.

But air-quality officials have said they doubt that any reformulated gasoline could result in emissions reductions comparable to those possible with methanol or other alternative fuels.

The two industries have not reached agreement yet on the shape of the task force and may have conflicting goals.

Those at the Detroit meeting included Richard M. Morrow, chairman and chief executive of Amoco Corp. and chairman of the American Petroleum Institute; Lodwrick M. Cook, chairman and chief executive of Arco; Kenneth T. Derr, chairman and chief executive of Chevron Corp; Frank H. Richardson, president and chief executive of Shell Oil Co.; James W. Kinnear, president and chief executive of Texaco Inc.; Roger B. Smith, chairman and chief executive of General Motors; Harold Poling, vice chairman and chief operating officer of Ford, and Gerald Greenwald, vice chairman of Chrysler.

Since then, Unocal Corp. and other oil companies have become involved in the group.

Automakers have argued that mandating alternative fuels would require major redesigns of existing vehicles and that production may not be feasible until after 1995.

Oil companies have resisted methanol as the alternative fuel of choice. Besides requiring massive investments in new refineries and pipelines, the use of methanol would raise serious questions about public safety and health, the companies argue.

The joint meetings among top oil and auto executives have been precedent-setting, Wiese of the American Petroleum Institute said. But agreement between the two groups may be hard in coming.

Emissions experts at the auto companies argue that the major improvements will have to come from reformulated fuels, adding that automakers have carried most of the burden of recent smog mandates.

"There should be some greater interest on the part of the petroleum industry," said GM's Colucci. "If they can make gasoline into an alternative fuel, the crude in the ground and the refineries that convert it into gasoline will still have great utility."

Oil company officials argue that improvements must come in both engines and fuels.

"It's always easier to ask the other industry to do the job," said Gordon E. Allardyce, executive engineer in charge of certification and regulatory programs with Chrysler. "But everyone recognizes that everyone has to do his share."

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Of special concern to environmental groups, such as the Appalachian Trail Conference, are five miles of the Appalachian National Scenic Trail and a section of Stony Creek, a designated scenic and wild river area in Lebanon and Dauphin counties over which the fighters would fly.

The state has an agreement with the National Park Service to keep the trail remote. But the rise in air traffic would increase the noise in both supposedly serene environments. A single, direct overflight could reach 100 decibels, the volume of an ambulance siren, according to the draft environmental assessment.

William Howard, superintendent of World's End State Park, said he is used to airplanes flying low over the park about once a month and doesn't want more frequent flights.

"They come right over us, dead over us," Howard said. "When you can damn near look the pilot in the eye, it's closer than 400 feet."

The DER, like other environmental groups, will make comments to SAC on the draft assessment by the mid-August deadline. SAC will then do a final environmental assessment which will be open to comment as well.

Although the first assessment says flight plans could be modified or noise levels mitigated, Pennsylvania's U. S. senators decided not to wait for the deadline to make their feelings known.

Heinz wrote to the SAC commander requesting he rethink the plan, said Heinz's press secretary Grant Oliphant. And Specter wrote to Defense Secretary Richard Cheney suggesting the plan be implemented in a more sparsely populated area and requesting a personal review, said Specter's press secretary Dan McKenna.

Other groups responding negatively to the plan included the Pennsylvania chapter of the Sierra Club, the Appalachian Trail Conference, the Appalachian chapter of the Audubon Society and the Pennsylvania Federation of Sportsman's Clubs.

All would like to see a detailed environmental impact statement.

"In the past, in other situations and other states, the Sierra Club has had to file suit to force an EIS (environmental impact statement) from the military," said club spokesman Jeff Schmidt. "We (the Sierra Club) have demonstrated our resolve to fight this in court if we have to."

Cindy Adams Dunn, president of the Appalachian chapter of the Audubon Society, lives near the bombing range at Fort Indiantown Gap. "I wouldn't be surprised if a coalition forms to oppose this issue. People are already talking about pulling it together."

Bonita Hoke, executive director of the sportsman's club, said the group is doing an independent study to determine the effects of the overflights. She said she is especially concerned about birds because a migration flyway is near the military flight pattern near the New Jersey border.

"When you think about it, they (the birds) aren't going to change their flight plans to accommodate the Strategic Air Command. Migratory birds use it on a regular basis; it's dangerous for aircraft to go through there," she said.

The Pennsylvania Game Commission doesn't see the plan as a danger to wildlife, said spokesman Roger Lehman.

Those concerned about the plan should take action now, said Grace Bukowski, military projects director of Citizen Alert, an environmental group that has an 800 number for military overflight concerns.

The number is 1-800-SKY-GUARD.

To fight the issue, citizens should get the support of local pilots and airport authorities because the FAA makes the final decision on such issues, Ms. Bukowski said.

"I don't know if you've ever had a jet fly over you at 400 feet," she said. "It's not fun. You know something has happened to you."

BOOK REVIEW

Eleanor Eells' **History of Organized Camping: The First 100 Years;** 162 pages, $19.95.

As all you happy campers return to home base and prepare for the season's change you might consider your experience from the historical perspective. Eleanor Eells' **History of Organized Camping,** provides the chronological background and evaluation of the organized camping movement.

Published by the American Camping Association with support from the Fund for Advancement of Camping, Eells began working on the book in 1968. The reader should be prepared for Eells' treatment of her subject. It is not typical of popular historical non-fiction.

Although 1861-1961 misses the Woodstock event—as if you hadn't been reminded—Eells' descriptive style would have provided a matter-of-fact report on the social and cultural attitudes contributing to the event. The satisfaction provided by the book derives from clear exposition. Changing definitions expand as each of the periods unfold: The Beginning 1861-1910; Camping as a Growing Vital Force 1910-1918; The Period of Challenges 1918-1945; The Period of Acceptance 1945-1961.

Eells doesn't predict a Woodstock or an Earth Day. Concise description of the forces and individuals is presented without bias. The repetition of each period's expression presents camping from a new perspective in each period. (The appendix may be the closest thing to a Who's Who in camping.) Economy and precision are the stylistic tools that the author used to maintain a concise, textbook-like rhythm.

The American Camping Association's definition begins the book by distinguishing between "housekeeping in a natural environment" and organized camping. Organized camping means more than living outdoors:

> "sustained experience which provides a creative, recreational, and educational opportunity in group living in the out-of-doors. It utilizes trained leadership and the resources of natural surroundings to contribute to each camper's mental, physical, social, and spiritual growth."

Early development of camping is best understood as it influenced institutions of the times; and, not as the product of a visionary leader. The diversity of camps contributed to difficulties in defining a "camping experience." Virtually all early camps, residential or summer day, focused on youth development. This concern was to continue throughout the formative periods.

Seemingly selected for a capacity to self-evaluate, excerpts from the credo of early camping leaders gives insight:

> "Our race began its career in the open. After a time it began to build houses. The houses were made closer and closer, tighter and tighter, until air was shut out. If a man were feeble, it was understood that the most dangerous thing he could do was to breathe air out-of-doors after sunset until the sun was well into the

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PLANT IDENTIFICATION

Earl L. Core, WVU
From West Virginia Plants in Autumn

We must not only consider how things are, but how they came to be so. 'Tis pleasant to look upon a tree in the summer, covered with its green leaves, decked with blossoms, or laden with fruit, and casting a pleasing shade under its spreading boughs; but to consider how this tree with all its furniture, sprang from a little seed; how nature shaped it, and fed it, in its infancy and growth; added new parts, and still advanced it by little and little, till it came to this greatness and perfection, this, methinks, is another sort of pleasure, more rational, less common . . . So to view this earth, as it is now complete, distinguished into the several orders of bodies of which it consists, every one perfect and admirable in its kind; this is truly delightful, and a very good entertainment of the mind; but to see all these in their first seeds, as I may so say; to take in pieces this frame of nature, and melt it down into its first principles; and then to observe how the divine wisdom wrought all these things out of confusion into order, and out of simplicity into that beautiful composition we now see them in; this, methinks, is another kind of joy, which pierceth the mind more deep, and is more satisfactory.

— Thomas Burnet

Records of the past help to decipher the present. Fossil records tell of the evolution of plants from simple to complex organisms. Variations in plants have left a record illustrating diversity. Although one can only view a "scale tree" partially imaged in rock, these early plant fossils are classified by paleobotantists by the classification system used by botantists today.

In West Virginia, plant fossils may be found around coal deposits, limestone beds, highway cuts, natural cliffs, and quarries. As they were studied and mapped, the same coal beds were sometimes given different names in different areas. Often, the only key to identification is in the fossil plants of the roof shales and the plant spores contained within the coal.

Identifying living plants is a different activity. An analogy might go something like: paleobotany is to botany as bookkeeping is to Lotus 1-2-3. The experience has fundamentally altered the activity even though a common theme remains.

Dry flower techniques and availability increased the popularity of autumn flowers. In addition to the beautiful colors of tree foilage, several species of late summer or fall blooming plants occur in West Virginia.

ASTERS

Asters, like goldenrods, are characteristic of autumn; 24 species have been found in West Virginia. There are many colors of the ray and disk flowers. The size of the plants vary greatly, and there are some species for virtually every ecological site in the State—from wet to dry, from the highest elevations to the lowest. One of the most beautiful is the New England aster; one of the most abundant is the white heath aster.

GENTIANS

Gentians are typical plants of autumn and their deep-blue flowers, in bloom from midsummer to midautumn, match the skies of October's bright blue weather. The fringed gentian are more abundant. The entrances and exits of bumblebees on pollinating visits to the flowers are among the more fascinating little dramas of natural history.

GOLDENRODS

"The charm of the goldenrod" is synonymous with autumn. There are 29 species in West Virginia. Fields are yellow with them from midsummer until early autumn, and some species remain in bloom until November. Contrary to a rather general belief, goldenrods are not among the major causative agents of hay fever; their pollen is too heavy to be easily windborne.

LADIES'-TRESSES

Most orchids bloom in spring or summer, but the ladies'-tresses are little white-flowered orchids that may be seen in bloom in thickets or pasture fields as late as October. There are five species of ladies'-tresses in West Virginia, and one or another can be seen in flower from May until well into autumn.

LOBELIA

Several species of lobelia are found in West Virginia. Most common is cardinal flower (Lobelia cardinalis) with brilliant scarlet flowers in bloom along streams from June until November. The last two yield products which are used in quack remedies.

MISTLETOE

Although nearly everybody has seen the mistletoe in fruit, hardly anyone ever sees it in flower. The tiny flowers open in November, and like the witch hazel, nearly a year is required for the ripening of the fruits and seeds. Mistletoe is actually a woody parasite developing in the crowns of trees. The evergreen leaves are conspicuous in winter, when the leaves have fallen from the host tree. The seeds are sticky and are carried by birds from tree to tree, adhering to the bark and germinating.

PANICLED PHLOX

There are seven species of phlox in West Virginia, and some can be in bloom as early as late March, others as late as November. The panicled phlox is the latest blooming, and its flowering period extends from July into late autumn. This plant is well worthy of cultivation and may often be seen in flower gardens. The word phlox is Greek for flame and is suitable for the pink-purple flowers.

PEPPERMINT

Many mints decorate the autumn fields, especially along streams. Mints, in general, can be easily recognized since they have square stems, opposite leaves, and usually a pronounced aroma. The peppermint was introduced from Europe and has become very common in wet soil in many parts of West Virginia. The herbage yields menthol, an oil used in flavouring medicine, chewing gum, candy, mint julep, tea, etc.

TOUCH-ME-NOT

From June until late October, there are two species of wild touch-me-not—a yellow-flowered one and an orange-flowered one—that decorate streamsides and moist, shady places throughout West Virginia. The showy irregular flowers hang on their pedicels like jewels or ladies' earrings, suggesting the name jewelweed, as they are sometimes called. The ripe plump capsules burst suddenly when touched, catapulting the seeds.

KEY TO COMMON PALEOZOIC FOLIAGE IN WEST VIRGINIA

When you wish to identify a specimen, this key can lead you to its generic name. Start at Step 1, and decide whether the foliage is arranged in whorls on jointed stems, or not. Then proceed accordingly to Step 2 or 4, etc. (NOTE: This key is not comprehensive—it covers only the more common and representative form-genera of Carboniferous age.

1a. Foliage arranged in whorls on jointed stems—Go to 2.
1b. Foliage not in whorls on jointed stems—Go to 4.
  2a. Leaflets with one simple vein; more or less lance-shaped to needlelike—Go to 3.
  2b. Leaflets with repeatedly forking vein; wedge-shaped to broadly ovate: **Sphenophyllum.**
3a. Whorl flattened in plane of stem, resembles a rosette: **Annularia.**
3b. Whorl flattened laterally, leaflets cupped upward around stem: **Asterophyllites.**
  4a. Specimen is large (usually several inches); irregularly lobed or highly dissected leaf-like structure; usually made up of complicated tufts and small vari-shaped tongues; veins indistinct: **Aphlebia.**
  4b. Not as above, actual leaf or pinnule—Go to 5.
5a. Long, slender, grasslike or strap-shaped leaves or pinnules—Go to 6.
5b. Fern-like fronds or separate pinnules detached from them—Go to 8.
  6a. Leaves long, grasslike, usually incomplete, with a single central vein normally represented by a groove: **Lepidophylloides.**
  6b. Leaves strap-shaped with many veins—Go to 7.
7a. Leaves with numerous longitudinal veins, but without a distinct midvein: **Cordaites.**
7b. Leaves with a well-developed midvein which gives off slender lateral veins: **Megalopteris.**
  8a. Fronds with entire or smooth-margined pinnules, or occasionally lobed, toothed or fringed, but not dissected—Go to 9.
  8b. Fronds with distinctly lobed or dissected pinnules—Go to 20.
9a. Pinnules attached to rachis by a single point—Go to 10.
9b. Pinnules attached to rachis by the entire base—Go to 12.
  10a. Lateral veins form a network; pinnules tongue-shaped: **Linopteris.**
  10b. Lateral veins not forming a network—Go to 11.
11a. Pinnules tongue-shaped: **Neuropteris.**
11b. Pinnules circular: **Cyclopteris.**
  12a. Pinnules with more than one vein entering base—Go to 13.
  12b. Pinnules with a single vein entering base—Go to 18.
13a. With accessory pinnae or pinnules between normal pinnae—Go to 14.
13b. Without accessory pinnae or pinnules between normal pinnae—Go to 16.
  14a. Pinnules scythe-shaped; intercalated pinnules half-round: **Lescuropteris.**
  14b. Pinnules not scythe-shaped—Go to 15.
15a. Pinnae nearly all the same size: pinnules with parallel margins perpendicular to the rachis and only slightly decurrent if at all: **Callipteridium.**
15b. Pinnae diminished in size in descending order; pinnules decurrent and usually at an angle to the rachis: **Callipteris.**
  16a. Midvein absent; several veins enter the base, fork and run longitudinally through the pinnule; **Odontopteris.**
  16b. Midvein present; lateral veins arch from, or are nearly perpendicular to, midvein—Go to 17.
17a. Lateral veins numerous-to-crowded, pinnules decurrent, often united at the base: **Alethopteris.**
17b. Lateral veins not crowded, base of pinnules usually constricted, not united, not decurrent; **Danaeides.**
  18a. Pinnules decurrent—Go to 19.
  18b. Pinnules not decurrent: **Pecopteris.**
  (Poorly preserved **Danaeides** may key out here).
19a. Pinnules somewhat triangular, moderate-to-large; basal pinnule usually larger than the others: **Mariopteris.**
19b. Pinnules small, laterally united; vein forks and veinlets angle sharply to 2 or 3 usually noticeable teeth: **Alloiopteris.**
  20a. Pinnules dichotomously dissected into linear segments; single vein in each segment bordered by a very narrow strip of laminae or leaf blade: **Rhodea.**
  20b. Pinnules not dichotomously dissected into linear segments, lamina prominent—Go to 21.
21a. Midvein seldom discernible (if so, less than ½ the pinnule length)—Go to 22.
21b. Midvein discernible at least ½ the pinnule length—Go to 23.
  22a. Pinnules irregularly shaped and dissected, usually fragmentary: **Eremopteris.**
  22b. **Pinnules rounded or divided into rounded segments: Aneimites.** (The large, distinctly three-lobed form is usually assigned to **Triphyllopteris).**
23a. Pinnules decurrent, leathery, somewhat triangular; basal pinnule on lower side of pinnae often larger or bi- or tri-lobed: **Mariopteris.**
23b. Pinnules stalked, or not distinctly coriacious; small: **Sphenopteris.**

***From* Plant Fossils of West Virginia**
WV Geological and Economic Survey

WHY LEAVES CHANGE COLOR

It requires no vivid imagination to picture Mother Nature going about on autumn days with a liberal supply of paint, with which she colors the leaves of the trees and other plants and thereby produces the riot of red, purple, orange, and yellow found in the woods. Every year at this time we revel in the beauty of the trees, knowing well that it is only a fleeting pleasure. Before long the leaves will flutter away from their summer home and become a part of the rich carpet that covers the forest floor.

Many people suppose that Jack Frost is responsible for the color change, but he is not. Some of the leaves begin to turn before we have any frosts. According to an Indian legend, celestial hunters slew the Great Bear in the autumn, and his blood, dripping on the forests, changed many leaves to red. Other trees were turned yellow by the fat that splattered out of the kettle as the hunters cooked the meat. Other peoples had other legends, but we now know that change in coloring is the result of chemical processes which take place in the tree as the season changes from summer to winter.

All during spring and summer the leaves have served as factories where most of the foods necessary for the trees' growth are manufactured. This food-making process takes place in the leaf in numerous cells containing the pigment chlorophyll, which gives the leaf its green color. This chlorophyll absorbs energy from sunlight and uses it in transforming carbon dioxide and water to carbohydrates, such as sugars and starch. Along with the green pigment leaves also contain yellow or orange carotenoids—which, for example, give the carrot its familiar color. Most of the year these yellowish colors are masked by the greater amount of green coloring. But in the fall, partly because of changes in the period of daylight and changes in temperature, the leaves stop their food-making process. The chlorophyll breaks down, the green color disappears, and the yellowish colors become visible and give the leaves part of their fall splendor.

At the same time other chemical changes may occur and cause the formation of additional pigments that vary from yellow to red to blue. Some of them give rise to the reddish and purplish fall colors of leaves of trees such as dogwoods and sumacs. Others give the sugar maples its brilliant orange or fiery red and yellow. The autumn foliage of some trees, such as quaking aspen, birch, and hickory, shows only yellow colors. Many oaks and others are mostly brownish, while beech turns golden bronze. These colors are due to the mixing of varying amounts of the chlorophyll and other pigments in the leaf during the fall season.

Fall weather conditions favoring formation of brilliant red autumn color are warm sunny days followed by cool nights with temperatures below 45°F. Much sugar is made in the leaves during the daytime, but cool nights prevent movement of sugar from the leaves. From the sugars trapped in the leaves the red pigment called anthocyanin is formed. Familiar trees with red or scarlet leaves in autumn are red maple, silver maple, flowering dogwood, sweetgum, black tupelo or blackgum, northern red oak, scarlet oak, and sassafras.

The degree of color may vary from tree to tree. For example, leaves directly exposed to the sun may turn red, while those on the shady side of the same tree or on other trees in the shade may be yellow. The foliage of some tree species just turns dull brown from death and decay and never shows bright colors.

Also, the colors on the same tree may vary from year to year, depending upon the combination of weather conditions. When there is much warm, cloudy, rainy weather in the fall, the leaves may have less red coloration. The smaller amount of sugar made in the reduced sunlight moves out of the leaves during the warm nights. Thus, no excess sugar remains in the leaves to form the pigments.

Only a few regions of the world are fortunate in having these show displays.* Eastern United States and southeastern Canada possess large areas of deciduous forests with broad-leaved trees and favorable weather conditions, including ample rainfall, for vivid fall colors. Some western areas, especially in mountains, have bright coloration too. Eastern Asia and southwestern Europe are others. The broad-leaved evergreen trees in the tropical rain forests shed their leaves very gradually, one at a time turning yellow and falling. In the seasonal tropical forests the foliage becomes parched and brown with the coming of the dry season.

As the fall colors appear, other changes are taking place. At the base of the leafstalk where it is attached to the twig, a special layer of cells develops and gradually severs the tissues that support the leaf. At the same time Nature heals the break, so that after the leaf is finally blown off by the wind or has fallen from its own weight, the place where it grew on the twig is marked by a leaf scar.

Most broad-leaved trees in the North shed their leaves in the fall. However, the dead brown leaves of the oaks and a few other species may stay on the tree until growth starts again in the spring. In the South, where the winters are mild, some broad-leaved trees are evergreen; that is, the leaves stay on the trees during winter and keep their green color. Most conifers—pines, spruces, firs, hemlocks, cedars, etc.—are evergreen in both the North and South. The needlelike or scalelike leaves remain green or greenish the year round, though often becoming brownish green where winters are cold. Individual leaves may stay on the tree for 2 to 4 or more years.

Through fallen leaves, Nature has provided for a fertile forest floor. Fallen leaves contain relatively large amounts of valuable elements, particularly calcium and potassium, which were originally a part of the soil. Decomposition of the leaves enriches the top layers of the soil by returning part of the elements borrowed by the tree, and at the same time provides for more water-absorbing humus.

It is easy to copy brightly colored leaves with crayons or colored pencils. Place a leaf lower side up, because the veins on the lower side are usually raised. Then put a sheet of thin paper or writing paper (not thick drawing paper) on top of the leaf. Next, holding the paper and leaf so that they do not move, color the paper on top of the leaf. Use fast, slanting strokes as in shading. The shape and markings will be copied exactly. The veins and leaf border will show as heavier lines. Different colors can be used to match the shades or markings. After you have colored over all the leaf, cut out the paper leaf with scissors. Of course green leaves can be copied at any time in the same way.

—U.S. Dept. of Agriculture, Forest Service

*Autumn Color Tour information available in brochure form from WV Department of Natural Resources.

"To this purpose I do not doubt but that it would be of very good use to have natural maps of the earth . . . Me thinks every prince should have such a draught of his own country and dominions, to see how the ground lies . . . which highest, which lowest . . . how the rivers flow, and why; how the mountains stand . . . "

— Rev. Thomas Burnet

IMAGINARY REPRESENTATION

This month the Legislative Coalition is meeting to "map-out" a strategy. Priorities will be determined. Groups with diverse interests will evalute environmental threats while sketching a unified perspective on legislative activity. This environmental coalition has a history in West Virginia. Past success could be attributed to the well-defined efforts of the Groundwater Coalition. A map of West Virginia (see Voice May 1989) identifies contaminated sites and endangered sites in each county. The visual impact of this thematic map is potent. Valuable information is also readily obtained by the observer through analysis of detail.

Two-dimensional limitations—let's not consider computer-generated alternatives just yet—need not restrict the imaginative perceiver when presented with a thematic map or a topographical map. Composite maps are increasing in popularity as computer graphics and printers advance in technology. The capacity to compare and contrast features on the base map (the conventional surface outlines of an area) while superimposing specialized data, e.g., flood plain areas, coal mines, highways, climatic patterns; can be a powerful aid for planning or providing visual assessment of an area.

Perhaps inter-planetary maps will need more than four compass points. In our world, north, south, east, west and the lines of latitutude and longitude have facilitated standardization. About 1950, the 7.5 minute quadrangle map became the major topographic map produced by the U. S. Geological Survey. These maps are especially suited for illustrating details. Physical features clearly represented and demarcated give the map reader consistent proportions and an accurate image.

In the U. S. the best known topographical maps are the quadrangle series. Different scales fulfill different needs of the user. Map scale is stated as a ratio or fraction. 1:24000 (1/24000) defines one unit, whether an inch or centimeter, on the map as an equivalent of 24000 of that unit in horizontal ground distance.

Large scale maps, 1:24000, are useful for detailed engineering plans. Intermediate scale maps 1:50000 to 1:100000, are sufficient for land management and general planning. Small scale maps, 1:250000 provide extended views, efficacious of regional planning needs. The amount of detail omitted varies inversely with the map scale.

Accepted practices acknowledge methods designed to met National Map Accuracy Standards. Standards also ensure uniform translation of map data when digitizing information and when defining digital data into graphic images. Map maintenance often takes advantage of new technology. Remote sensing techniques are a valuable supplement to field evaluations. In 1980, a National Digital Cartographic Data Base was formally established. Its objective is to provide users with cartographic data in computer form.

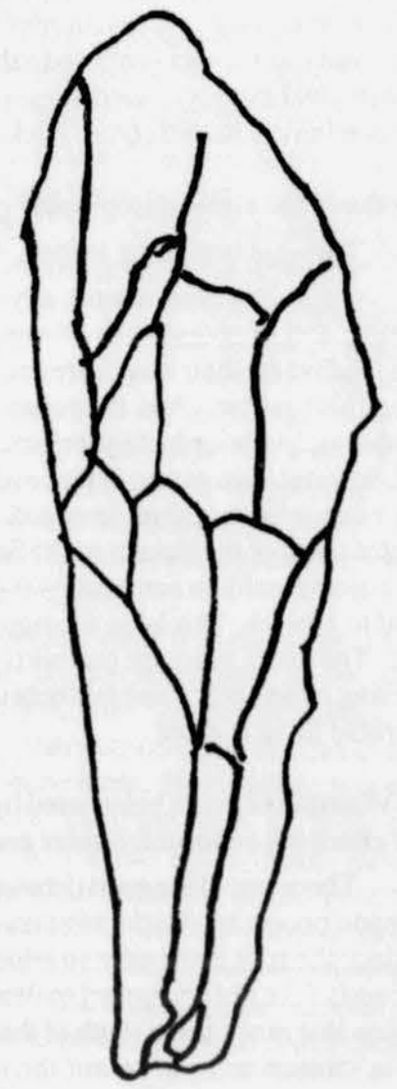
Digital or in-hand, topographical maps provide the most information in the most economical and beautiful format. National Park Service maps and Forest Service maps often supplement the conventional symbols of topographical maps with symbols denoting recreational features. Forest Service maps are based upon a primary base series map. Maps of special areas within the Forest and general use maps are available to the public. The Park Service uses the standard topographic maps of the Survey.

Standard symbols and surface area patterns used by the Survey include representations for woodland, submerged marsh, orchard, vineyard, mangrove, scrub, wooded marsh, dam with lock, canal with lock, earth dam, wells, mine shaft, rapids, falls, marsh, dry lake bed . . . Contour lines are the principal means of showing shape and elevation. Each contour line represents a definite ground elevation measured from mean sea level. On steep slopes the lines are more closely placed than on gentle slopes. Generalizations are sometimes required by the map maker to ensure readability.

Color and shading contribute information and a vivid visual impact. Primary highways are represented as a thick, red line. State, county, city, and town have a distinctive black line to demarcate boundaries. In West Virginia, state and county boundaries are the same boundaries given by the U. S. Geological Survey maps.

Strip mines are indicated by an intricate pattern. Underground mines are more difficult. A mine adit is shown by the X symbol. The stem is aligned in the direction of the tunnel and the junction of the arms is positioned at the point of entry. A shaft is shown by the mine shaft symbol (square half white, half black, on the diagonal) centered on the opening. Prospects are shown by a sawbuck symbol oriented north-south (X). Mill tailings and mine dumps that are piled randomly are shown by approximately the outline. Ponds of waste are outlined in a brown dashed line.

The outlines for legislative action the Coalition will draft this month will not emphasize detail. The environmental map of West Virginians concerned about degradation and quality of life will be done in broad strokes that provide a regional vision of what can be.



"Think Globally, Act Locally"

An interview with Rene Dubos

By Truman Temple

Dr. Dubos, you have written and spoken for many years on the adverse effects of environmental problems on mankind. Historically, has man been able to improve his environment anywhere?

I have an optimistic attitude about human intervention into the environment. I was raised about 30 miles north of Paris. This is a country which from the natural point of view was *completely* covered by forest and marshes until about 4,000 years ago. At that time Neolithic man settled in it and began clearing the land. Since then it has been under heavy agriculture with a very high population density. And yet today, many people think it is one of the most enchanting kinds of European landscapes, much like English East Anglia which also was forest and marshes before the advent of man.

Human beings can intervene into nature and transform it, provided they do it with ecological wisdom. Ecological wisdom in the past was purely empirical. People did certain things without knowing why, but now we have enough knowledge that we can change the landscape without destroying it.

In this country, the Pennsylvania Dutch country is an example of that. It was created only 200 or 300 years ago by the Amish people and others who have maintained an extra-ordinary quality of land and have made the countryside singularly more interesting than it was before. I could say much the same about some of the New England countryside.

This is the thesis I have defended for four or five years in articles and books. In fact in one book, "The God Within," I express that very strongly but now I am going to defend it in a much more scientific way and document it a little better. So that brings me to a fairly elaborate statement that I presented at the University of Colorado in Boulder a year or so ago, which is going to be published. I call it the resilience of ecosystems. I believe that *anywhere* in the world, almost, an ecosystem that has been damaged can be brought back to a good condition if you help nature to function with the natural repair systems that exist. It is easy enough to see on the East Coast where farms have been abondoned only 50 or 60 years ago, that the forest comes back spontaneously. Forty years ago I bought an abandoned farm in the Hudson River Valley and I know what that means.

We understand that you and your wife planted many trees there.

Hundreds of trees, yes. We spend most of our week-ends reforesting and taking care of the trees but also trying to manage to keep open views, to keep the country and that farmland more interesting. Hemlocks do wonderfully well so we have planted a lot of them, and they are now magnificent. This is in Garrison, New York, in the Hudson highlands. It is a countryside where most of the farms were abandoned 100 years ago when it became much easier to go and farm in the Midwest and Far West. But when I speak of the resilience of natural ecosystems, of their ability to recover after all sorts of damage, people say, "Well you are speaking of the East Coast where we have an abundance of good water, rainfall, and where things can recover. But that is not true for the rest of the world."

Now that is what I used to believe until I began to look into it, and to discover that almost *anywhere* in the world on the surface of the Earth, ecosystems can recover. Let me give you a few examples. The Mediterranean lands and Greece in particular, 4,000 years ago were a heavily forested country. Plato in one of his most famous dialogues said that in the old days all of Greece was forested. There were beautiful streams where the temples were erected, whereas now many of those streams have dried up and those slopes are denuded, and eroded completely. And of course this is absolutely true. But then about three years ago I went through Greece with a very famous planner, Constantinos Doxiadis. He showed me that if you take any one of those islands and just prevent goats and rabbits from browsing, without your doing anything, within ten years you have good-sized trees, and all sorts of other vegetation. In other words, even under these conditions, nature comes back.

Why don't the Greeks stop using goats? There must be an economic reason.

They are beginning to stop. As prosperity comes in, they stop using them.

Goats can feed almost anywhere whereas of course, cows won't. A goat will eat anything, and of course, kills all vegetation. But, right near Athens some people I knew have taken land where their homes are and they fenced it completely. This was not only to keep goats out but also rabbits. And if you walk through that area you see the classical Mt. Hymettus denuded and as described by writers, but there is a whole section of it now which is reforesting itself. So what I am saying is that even under very difficult condition, nature can recover. The most extraordinary example was discovered by satelitte three years ago during the famous drought south of the Sahara in the Sahel country. People observing maps saw a big area more than a quarter million acres that was green in contrast with all the rest that was desert. That was traced to a ranch. This large acreage was fenced and divided into sections in which they have cattle. The cattle graze on one section a year, then move to the next section and there is no browsing by any other animals because it is fenced. And if you do that even during the drought the whole thing is green.

This example of goats being used by low-income farmers brings up another point. Can the poor climb the economic ladder and cope with environmental problems at the same time?

This is one of the great debates. It is not how can the poor improve their lot, because they are made poorer by the devastation of land through the use of goats. It is a matter of how to convince them. It is not only an educational matter but it involves a program using authority. Obviously I am not competent to deal with such political and economic questions. The reason I mention that ranch in the south of the Sahara is that it points to the possibility of using part of the land in rotation so as to permit the rest to recover.

We hear attacks being made on the enviromental movement, charging that it serves mainly the affluent and preserves the status quo, such as the much-publicized Storm King Moutain controversy. Do these charges have any validity?

I am interested that you should mention Storm King because our place in Garrison is only a few miles from it. Anyone, rich or poor, who lives in the area where they can look at it or go fishing in the Hudson is against using Storm King for a reservoir, because it would not only change the appearance of a most beautiful piece of scenery but also would decrease enormously the amount of fishing one could do in the river. Because if the water is being pumped when the fish are breeding, many small fish would be destroyed. It is not a nuclear power plant. They would pump up the water during the night, creating a reservoir, and then during the day the water would come down and generate electric power. But that enormous amount of pumping is fantastically destructive to fish life. So you do not have to be a wealthy fisherman to be against it. On the other hand, if you live in the village where the Storm King reservoir is being built, then you would be in favor of having it because this would bring employment while it is being built. It is a very complicated problem.

In your book *So Human An Animal,* you mentioned concern that urban man's senses have been dulled, that he accepts dirty air and noisy streets because he is so adaptable an animal. How do we reverse this?

I mentioned one aspect, how quiet New York City is on special occasions when they ban cars. You know they ban them now and then on Fifth Avenue, and during the week-ends in Central Park they completely ban the car all year round.

And you mentioned that New Yorkers actually smile on those streets.

Yes, it is absolutely extraordinary. I had an illustration of this recently. A young woman came to see me who comes from Cleveland. I asked her, "How can you bear living in New York? Isn't it terribly painful to you?"

And she told me, "Well yes, of course." Because she was used to running with her dogs and went horseback riding. But she said, "Fortunately, I have discovered that on week-ends there are no autos in Central Park and I love to go bicycling there. Everybody looks so jolly and so happy and so much more friendly than they are in Cleveland!" I was startled to hear that. Also, my wife, who is from Ohio, has also said this to me. As soon as you can place yourself somewhere in New York where you are not overpowered by the noise and traffic and neon lights, then in a way New Yorkers are much more responsive people than they are in Columbus or Cleveland.

What I really want to say is that even in the worst U.S. cities, like New York, with its noise and environmental insults, it is very possible to create a physical environment in which people are quite happy. And that brings me to complain about something.

I believe I can say without exaggeration that American cities, most of them, have the most wonderful waterfronts of any cities in the world. I have traveled over much of the world and I don't think there is *any* city that can compare with New York City, with regard to its waterfront. We have the Hudson, we have the East River, we have the Harlem River, we have the oceanfront, and there are even some lakes within New York City. But it has spoiled those waterfronts like no other city in the world. And I think that is true in practically all American cities. In large European cities like London, Paris, and Berlin, which have rivers that do not compare, cannot begin to compare, with what there is in New York, the waterfronts are enchanting. There are places where there are fine restaurants, where people go walking, where they are the most romantic parts of the city. It seems to me that in this country with the fantastic diversity and wealth of waterfronts we have, it is a national duty to create environments that are suitable to human life, for human pleasures. And if we did that, I think we would decrease the need for people to escape from New York every week-end. If we were to manage our waterfront the way London, or Paris or Berlin have managed their miserable ones, I think instead of driving 50 miles every week-end to go somewhere, many people would enjoy the waterfront. I think from the social, economic and pollution points of view it would contribute more to make poor people able to enjoy this city than anything else we could do, and from the energy-conservation point of view too.

I have been guiding the development of a new program organized under my name—the Rene Dubos Forum—that will explore human activities ad they related to nature. I am very encouraged by the fact that the National Endowment for the Humanities under the direction of Joseph Duffey has chosen to support these efforts. His desire to relate the social utility of the humanities to improving the American environment bodes well for the future.

I am not speaking of this as a scientific problem, although it has scientific ecological components, of course. But I am speaking of using the environment, improving it as a form of giving values to humanities in American life.

There seems to be an echo, in what you are saying about waterfront, from Voltaire's Candide: "Let us cultivate our garden."

Yes, that conveys in part what I believe. When I talk at universities to students, they always want to discuss saving the globe, and I am all in favor of that of course. But I always answer, "It's very good to think about problems in a global way, I think it is a good intellectual exercise, but the only way where you can do something is in your own locality. So think globally, but act locally. If you cannot do something about that stream or those lovely marshlands in your town, then how do you think you are going to save the globe? That's exactly "Cultivate your garden." And then after that, you can perhaps think on the larger scale about global problems.

(Continued on Page 7)

(Continued from Page 6)

Dr. Dubos, you turned 77 in February. Looking back, what have been the most dramatic changes regarding the welfare of the planet and its inhabitants you have seen in your lifetime?

There is no doubt that the great revolution happened in the 1960's, and was a revolution in the minds of people. Something happened then which made people aware, probably first in the Anglo-Saxon countries, that if we were to continue the way we were going, it would destroy everything. And this revolution was not only in the mind, it immediately was converted within a few years into action.

Now that movement has reached a country like France in a phenomenal way. I think in some ways there is more activity in France towards saving the environment than there is in this country. As perhaps you have seen in the last election, ten percent of the population voted the ecological ticket, it's a political ticket, so influential now that any political party in France has to talk ecologically. Obviously it was first most active in this country, and also in Great Britian, Sweden and Scandinavia.

What has most impressed me is how rapidly one can mobilize public opinion and do things in a particular place. So I will mention examples of two cities in which I had some activity. One is Seattle. As perhaps you know Lake Washington in Seattle ten years ago was said to be dead. A group of citizens began to save Lake Washington and after two or three years, they managed to have bonds floated to stop pollution, there was no longer any domestic sewage or industrial effluent flowing into the lake. Within seven years, Lake Washington returned to the state in which it was before the white man came in. Now that has had a fantastic impact in Seattle, because real estate values all around Lake Washington increased enormously. All sorts of pleasurable occasions became possible out on Lake Washington and the whole city of Seattle now is really transforming itself into a very pleasant city.

Now let me mention New York City, Jamaica Bay, adjacent to Kennedy Airport, for several decades had been used as a place where the city dumped its garbage. Every day, hundreds of trucks dumped garbage into the bay and there were 1,600 sewer lines feeding into it also. A few years ago a city employee of the Parks Department decided that he would, on his own, try to do something to save Jamaica Bay. He began planting trees on those garbage islands. Trees, shrubs, and so on. He was in the Parks Department. His name was Herbert Johnson. Then the city began to take an interest in it. It began to establish water treatment plants so that the sewers did not go into it. The bay began immediately to improve. Water birds came back. The oyster industry has started again. And other shellfish and fin fish, because rapidly conditions improved.

Something else happened, however. About four or five years ago, there was a plan to extend runways of JKF into Jamaica Bay because they wanted to enlarge the airport. The National Academy of Sciences planned a study of what would be the ecological consequences of extending the runways into the bay. That irritated me a great deal. I made a public statement that one did not need an ecological study which would take two or three years to know that extending the runways would damage Jamaica Bay. Well, the *Village Voice* played it up, then other environmental groups played it up, and somebody arranged a big meeting at Jamaica Bay in which several persons spoke and I was one of them. The New York times sent people, and managed to take a photograph of me, saying that, if we do respect Jamaica Bay, allow it to evolve in an ecologically sound way, what we are going to have is a marvelous bird sanctuary, which it is now. It has the largest number of birds and diversity of birds on the East Coast, so I said we can have this and have it compatible with technological development. You could have the birds and you could have the jets on the other side.

The Times published the photograph, on the first page, with a statement. And shortly afterwards Governor Rockefeller decided that the Kennedy runways would not be extended. I am sure it was not my speech that convinced the Governor. It was just that public opinion could be aroused against it. So it is possible to sensitize public opinion provided one finds issues meaningful to people. Now this has extended into something much bigger. You probably know that Congress established about two years ago the Gateway National Recreation Area which has the largest budget of any National Park. It includes Jamaica Bay, the Floyd Bennett airfield, Breezy Point, then Ft. Hamilton on Staten Island and Sandy Hook on the New Jersey coast. So all this is now a National park—the first large urban park in the world. I have been involved in trying to formulate how man could take advantage of the waterfronts of New York City and create an urban national park which has a large psychological significance for the country, because so many millions of people, including me, entered this country though the Gateway. I helped former Interior Secretary Stuart Udall to write a manifesto which is being used now for the planning. The new management of Gateway has raised the potential to more than $200 million in Federal money in capital improvements there. Now I understand that idea is being picked up by San Francisco to create something similar. All this demonstrates that a place like Jamaica Bay that was just for rats only 10 or 15 years ago can be converted into the most beautiful bird sanctuary on the East Coast. So that shows if we are willing to do things, we can save our environment. Even our urban environment.

Once you get it started, usually communities will respond. That's why I'm more optimistic than many people are. I am told lots of wonderful things have happened in Minneapolis, for example. And in San Antonio, Texas, where a miserable little river, it's not even a river, it was essentially used as a sewer line, has been converted into an enchanting area. So it can be done. The real problem is how can one mobilize public opinion and how can one make poor people realize that by so doing one contributes to the quality of their lives.

Do we need more environmental protection laws or do we have enough now?

My feeling is that there are enough, it is a question of enforcing them. One of my other activities is to serve on the Board of the Natural Resources Defense Council, chiefly as a scientific advisor. Their lawyers give me the impression that one does not need more legislation. It does exist. It is just the question of a place to apply it, so that there is a precedent. That's why Storm King was an extraordinary situation. I was flabbergasted when it happened. When Con-Edison presented their plan to build a reservoir up there, the local judge said that you could not do something that impinged on the value of the property of somebody else. The people with property facing Storm King said that the value of their property depended in part upon the scenic beauty of the place and that the beauty would be damaged by the reservoir. It is a precedent in the law now that aesthetic quality is a part of the value of your property.

Dr. Dubos, you wrote a biography of Pasteur that was republished with new material a few years ago. Why does this figure hold such significance for you?

He helped to create the science of medical microbiology, of course. But I became so interested in the environment during the past 15 years that on rereading the documents, I revised my biography of Pasteur written 30 years ago. I realized there was in his scientific attitude an enormous ecological component, an enormous interest in the environment which nobody had perceived.

He worked with the microbes that cause disease, but he also stated that the ability of the microbes to cause disease depended on the total environment in which the person lived. You take a child who is infected with tubercle bacilli. If this child lives under miserable conditions, he will develop clinical tuberculosis and many die of it. But another child who lives in good environmental conditions will also have the infection but has a better chance to recover from it.

So Pasteur constantly emphasized that the total environment influences susceptibility and resistance to disease. And that had not been recognized. Having moved from being a pure bacteriologist myself to a person concerned with the effect of environment on people, I took all of Pasteur's writings and singled out those statements that he made, even though he couldn't do very much about it.

I think that now we are ready to enter a phase of environmental medicine where, yes, we can recognize the importance of microbes and that is very important, but we also can analyze the effect of the environment on the susceptibility of people to infection. So this is why I decided to republish my Pasteur book with that new chapter in the beginning.

By the way, I was sensitized to the problem for a very personal reason. I used to be a perfectly orthodox bacteriologist and in fact I published several successful text books.

In 1942, my first wife, who was French, developed tuberculosis. We lived at that time in Dobbs Ferry, New York, under very pleasant conditions. There was no reason that she should develop tuberculosis. So I looked into her past. I knew that she came from a part of France where Limoges china is made. I knew that her father, who was a china painter, had died about the age of 45, and by that time knowing what I knew of tuberculosis, I recognized that he had died of silico tuberculosis, which is a kind very common among people who inhale silica in the china industry. I recognized that as a young girl, 6 or 7, my first wife had a long bout of pulmonary disease which obviously was tuberculosis, but from which she recovered because she was not exposed to silica. Then she became a very healthy woman. But then the war came, with all sorts of tragedies. Even though she did not suffer physically from it, all sorts of tragedies occurred in her French family which upset her tremendously. And what happened I am sure, even though it is impossible to prove, is that her old tuberculosis had become reactivated, and one knows that can happen.

So that made me become very much interested in the effect of the total environment on susceptibility of people to tuberculosis. And as a matter of fact I wrote a book called the *White Plague-Tuberculosis—Man—Society* in which I demonstrated that tuberculosis becomes an important disease any time a society is disorganized and where people are exposed to bad living conditions. It was a very common disease in the 19th century because of the industrial revolution and people moving from the country into the tenements of industralized cities. And then as the conditions improved, Europe became wealthy, then tuberculosis began to become much less important. And the same thing is happening now in all parts of the world which were poor and are now becoming industrialized and where it is a very common disease.

So I became involved in the effect of the environment upon tuberculosis, then more generally of the environment on infectious disease. And then finally the effect of the environment on the whole human life, and that is where I am now. That is why I put so much emphasis on the fact that we can improve our environment, and that a city like New York could have lots of wonderful waterfronts and parks. If we could manage them properly, people would live better, and wouldn't have to travel 50 miles to the country every week-end in all those enormous traffic jams, and we would save energy besides. People would become more pleasant. Human relationships would be improved. I think we could transform this city and at not an enormous cost either.

I think if I were Billy Graham, I would go out and preach to people that the best way to save their souls is to save the environment of cities like New York.

(Continued from Page 3)

> heavens again; night air was believed to be deadly though it was all that was available. The race was dying; dying of its own stupidity; dying from in-doorness. Then there arose apostles of fresh air; they preached the doctrine of out-doorness; the race was getting its breath again, and coming into its own."

City workers composed of mostly immigrant families were viewed as a segment to be Americanized. Relief from overcrowding and pollution of the slums came in the form of "Fresh Air Programs." Fresh Air funds were established from contributions from religious organizations and charities. Usually, administrators were clergy. English was spoken and American ways were encouraged. An outgrowth of these camps served physically handicapped children and adults. A connection between education and recreation was made. YWCA and YMCA also began programs for industrial workers and big city inhabitants of little means.

Establishment and refinement of private camps under the Camp Directors Association of America (1910-24) underscored shared principles and techniques. These beliefs became more than "positions." Eugene H. Lehman, Yale graduate and President of the National Association of Directors of Girls' Camps from 1919-20:

> "I. I must be well-educated; II. I must practice Freedom; III. I must improve myself . . . As an Educated spiritual human being, I shall do my best to understand these laws and to live in accordance with them . . . I am learning about the nature of beauty when I recognize the fact that from the beginning of history, man has been groping upward in his effort to comprehend the meaning of liberty and how to use it effectively . . . As a Camp Director, I must be content to reap unseen harvests."

The conclusion is formulaic but consistent with the expositive style of the book. Decisively, Eelles' conclusion allows the reader to characterize organized camping as a social movement. By providing historical perspective, camping may be seen as a response to trends. These trends include: wasted summer vacations, hardships of war, enculturization of the low socio-economic levels, solution to conservation, solution to physical fitness. It does appear that camping continues to be a response in contemporary life trends.

Registration Form
WVHC 1989 Fall Review
Bluestone State Park
October 13 - 15

Name_____

Address _____

_____

Phone ( )_____

# of people in party: _____adults(s) _____ children

LODGING - The Bluestone State Park cabins each have two (2) bedrooms to sleep a total of four adults. We will assign two couples per cabin, except for families with children. Let us know if your family would like to reserve an entire cabin for the weekend. We can reserve two extra cots per cabin. Remember to call Pipesteam State Park directly for reservations at the lodge, the toll-free number is 1-800-Call WVA, or (304) 466-1800.

Registration fee: $3.00 per adult $_____

Cabin Reservations:

Friday: $14.00 per person x _____=_____

Cots: $ 4.00 per person x _____=_____

Saturday: $14.00 per person x _____=_____

Cots: $ 4.00 per person x _____=_____

Total Lodging ..... $_____

Whitewater Raft Trip:

$61.48 per person x _____=_____
(Age 14 & over only)

Total to send in ..... $_____

Need Canoe Rental _____

Saturday Buffet: #adults _____ #children _____
The price of the catered buffet will be $6.50 for adults and $2.75 for children under 12. We will pay for our buffet on Saturday, but please indicate if you plan to join us, so we can plan ahead.

Nature Skool:

Children's Names	Age
_____	____
_____	____
_____	____

Children needing childcare during weekend

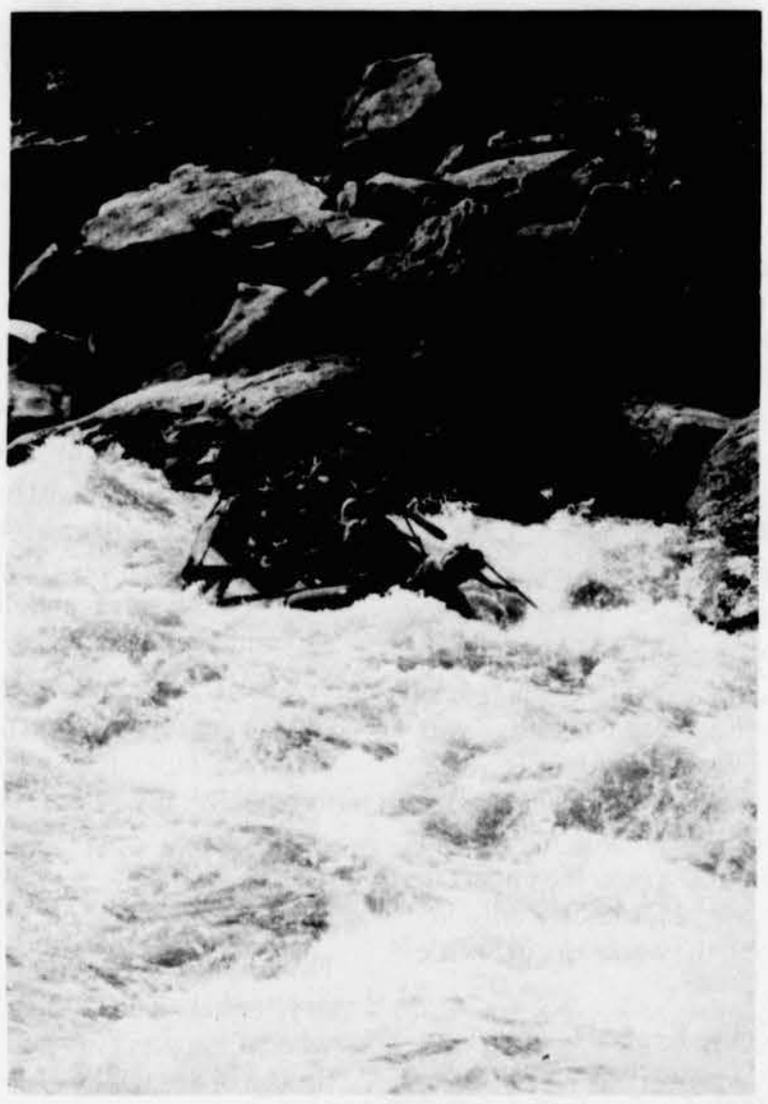
Children's Names	Age
_____	____
_____	____
_____	____

When we receive your reservations form, we will return a cabin assignment and a Bluestone State Park brochure. Friday dinner is on our own. We will have coffee and snacks available at the recreation hall for incoming guests.

Please make checks payable to **WVHC Fall Review** and return with this form to: **Helen Kramer, Rt. 87, Box 43, Nimitz, WV 25978,** or call Helen to reserve at (304) 466-3028.

FINDING BLUESTONE STATE PARK

Located in the southeastern section of the state, Bluestone State Park is accessible by several major highways. Take exit 139 (Sandstone/Hinton) off I-64 to WV 20, south, and drive 15 miles to the park. From the south on I-77, take the Athens Road Exit to WV 20, north, and travel 22 miles to the park.



OUTINGS

Whitewater Raft Trip down the New River. This year we're offering something very special for those WVHC guests who love river adventure, or who haven't yet experienced whitewater rafting. Wildwater Expeditions, Inc., will be our trip hosts. The cost of the trip will be $61.48 per person. We need to guarantee the group number early, so please respond by September 1, with your reservation form if you plan to join us on this trip. Also, plan to be ready early Saturday morning to leave for this trip. Lunch will be provided for this trip.

8-mile trek along the trail between Bluestone State Park and Pipestem State Park. After a nice hike, members will have lunch at Pipestem before returning by foot or by car to Bluestone State Park.

U. S. Park Service Tour of Historic Hinton, and other Scenic and Historic Sites. The Park Service guide will discuss future plans for the New River National Park, and other Park Service developments in the area.

Canoe trip down the Greenbrier River. Join WVHC canoe guide in a trip down the scenic Greenbrier River, or the New River (depending on water level). Bring your own canoe or rent a canoe by indicating on the registration form. Helen Kramer will make prior arrangements for rentals.

WVHC FALL REVIEW

NATURE SCHOOL

SATURDAY, OCT. 14, 9:00 A.M. - 4:00 P.M.

Nature Skool is a hands-on nature education program for children, ages 3-10. Activities include outdoor collecting trips, quiet observation, scavenger hunts, nature stories, microscope fun, and more. Children take home stickers, emblems, and simple tools to aid in their creative exploration of nature in their own backyards or neighborhoods. ADVANCE REGISTRATION REQUIRED.

$2.00 per hour per child

WVHC will contribute the remaining $2.00 hr.

WVHC '89 FALL REVIEW WEEKEND

Focus

The focus of the '89 Fall Review will be on the **Current Land & Water Conservation Issues in West Virginia.** Our Saturday evening guest speaker will be **Ed Hamrick, Director of the WV Department of Natural Resources,** who will present an overview of the management and conservation issues that DNR has addressed since January, 1989, and those that the department will be working on in the upcoming year. A question and answer session will follow the presentation. We're happy to have Mr. Hamrick join us.

Another specially planned event for the '89 Fall Review weekend is a **whitewater raft trip down the New River with Wildwater Expeditions.** If the adventurous part of your soul has not been well fed lately, come with us down the New River on Saturday, October 14 and replenish your spirit. We'll need your reservation early, so we can plan a great trip.

Lodging & Meals

Several cabins at Bluestone State Park have been reserved for WVHC members & guests. The Cabins have 2 bedrooms each, and available cots if needed. The cabins are heated and are well equipped with kitchen supplies and linens. Also, Pipestem State Park is just 9 miles from Bluestone State Park, and has rooms available in their lodge. To reserve a lodge room at Pipestem, call (304) 446-1800 or 1-800-Call WVA. Also camping space is available at Bluestone State Park.

WVHC will be providing a Saturday Evening buffet for Conservancy guests in the recreation hall, catered by Chef Walther from the *Something Special Restaurant* in Hinton, WV. The buffet will feature lasagna, eggplant parmesan, Italian mixed vegetables, salad & bread. For breakfast, the WVHC will have coffee, pastries, and fruit available each morning in the recereation hall. You're welcome to prepare any meals in the cabins as well. Guests should plan to prepare their own Saturday lunch to bring on the outings, except for the raft trip.

Other Accomodations:

Coast to Coast Motel, Hinton	466-2040
Newbrier Lodge Motel, Hinton	466-4378
Sandman Motel, Hinton	466-1700
Oak Supper Club	466-4800
Riverside Inn	466-2607
Something Special	466-4976

Bluestone State Park
Athens Star Rt., Box 3, Hinton, WV 25951
(304) 466-1922 or 1-800-Call WVA

WEEKEND SCHEDULE

Friday, October 13, 1989

4:00-11:00 P.M.	- Registration & Welcome
8:00 P.M.	- Slides and movies
9:00 P.M.	- WVHC Committee Meeting
9:00 P.M.	- Social Hour

Saturday, October 14, 1989

7:30 A.M.	- Bird Walk
8:00 A.M.	- Coffee & pastries at the Recreation Hall
9:00-4:00 P.M.	- **Nature Skool** for young folks
9:15-3:00 P.M.	- Outings, Meet at Recreation Hall
5:30 P.M.	- Buffet Dinner at the Recreation Hall
7:15 P.M.	- Saturday Evening presentation
9:00 P.M.	- Old time music & square dance, at the Recreation Hall

Sunday, October 15, 1989

7:30 A.M.	- Bird Walk
8:00 A.M.	- Coffee & pastries
9:00 A.M.	- Board of Directors Meeting
12:30 P.M.	- Lunch on your own