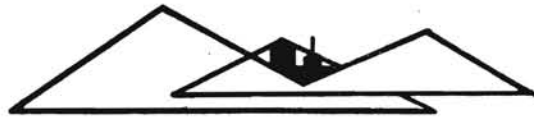


NEWS

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APPALACHIAN CENTER
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LETTER

Loyal Jones • Thomas Parrish, Co-Editors

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Act of Man ?

On April 4 a major storm struck the Appalachian South. According to reports from different places, the storm caused the worst flooding since 1957, or 1937, or perhaps the worst on record.

Aside from the enormous quantities of water that were dumped on the region, various other factors have been blamed for the heavy flooding - among them, forest fires, logging, highway building, construction of houses and shopping centers on flood plains and surface mining.

The last-named, said Gov. Jay Rockefeller of West Virginia, "contributed to the flooding problems." Gov. Julian Carroll of Kentucky, though not denying that strip mining might have played some part, seemed somewhat less inclined to place any considerable blame on it. In Corbin, Ky., a newspaper editor wrote bluntly that "uncontrolled strip mining is responsible for what happened . . . Not farming. Not road building. Not subdivisions. Just strip mining." Coal operators in the area didn't much like this talk (although the editor said "uncontrolled" mining) and they demanded - and got - his removal (by means of "resignation") from the city's recreation commission.

Kentucky author-conservationist Harry M. Caudill seemed to feel that Governor Carroll wasn't facing the issue, and he proposed that he and the governor debate the question on TV. The role of uncontrolled strip mining is obvious, Caudill says; "anyone with an IQ of 50" knows that removal of vegetation from hillsides leads to siltation in streams, and hence to overflowing.

The governor declined the offer, saying that "such a subject should be debated by individuals who have some expertise in the area" rather than by "two lawyers, one a governor and the other a writer."

The CENTER NEWSLETTER is well aware that strip mining is one of those emotional subjects, like abortion today and prohibition in earlier years, where the heat is of thermonuclear intensity. But we nevertheless thought it might be a reasonable idea to try for some scientific, nonlegal opinion on this simple question: What, in your view, was the relationship between the effects of strip mining and the intensity of the recent floods? Three scientists are our respondents.

First, Branley Allan Branson, professor of biology at Eastern Kentucky University. An ichthyologist, he has

Flood Study Wins Prize

Everything in Its Path, a sensitive and moving study of the destruction of community resulting from the 1972 flood in Buffalo Creek, W.Va., was honored as the winning work in the 1976 W. D. Weatherford Award competition at a luncheon held in Berea on May 3. The author, Kai T. Erikson, director of the American Studies program at Yale, was present to receive the \$500 prize.

The award is given annually for outstanding and effective published writing about Appalachia, in memory of the late W. D. Weatherford, a long-time pioneer in Appalachian development, youth work and race relations.

Also honored was Harry M. Caudill, lawyer, author and conservationist of Whitesburg, Ky., who was presented with a Special Weatherford Award for his contributions to Appalachia in bringing the region to national attention through his writings, ranging from *Night Comes to the Cumberlands* (1963) to his recent *Watches of the Night*. His award carried a prize of \$200. The prizes are donated by Alfred H. Perrin of Berea, who presented the awards to the honorees.

conducted studies on the effects of strip mining on stream life.

In the aftermath of the recent Kentucky floods, a great deal of dialogue has emerged with regard to whether or not strip mining played a role in delivering additional amounts of water to the already rampaging streams of eastern Kentucky. There seems little doubt that the rainfall immediately prior to the floods was of exceptional intensity. However, it is equally obvious that the flooding was of exceptional intensity, and that there may certainly be a correlation between land disturbance and flood intensity.

Denudation of the land causes large amounts of water to flow directly and swiftly into streams rather than entering them through the much slower process of percolation. Under normal conditions, the undisturbed forest floor acts like a sponge to slow runoff, to gradually release water, to curtail erosion and siltation. In the highlands of eastern Kentucky there has been an

enormous amount of land disturbance by strip mining, laying bare thousands of acres of soil and rock. Also -- particularly in the area surrounding Harlan -- highway construction has greatly disturbed the watershed of Poor Fork and its tributaries and other streams. Siltation from both processes has greatly reduced the carrying capacity of many streams, forcing runoff waters out of the normal channels. All of these things, of course, aid and abet flooding. Thus there seems little doubt that such land disturbances do, in fact, play an important role in rapid water delivery to streams and thereby increase the intensity of flooding, particularly when exceptional precipitation occurs.

Next, Willie R. Curtis is a research hydrologist with the Northeastern Forest Experiment Station, U.S. Forest Service. He is widely known as a researcher on the effects of surface mining on water resources.

The Forest Service's Northeastern Forest Experiment Station began a study in 1967 to evaluate the effects of surface mining on the water resources of small Appalachian watersheds. Six watersheds, three in Leatherwood Creek and three in Bear Branch in Breathitt County, Ky., were selected and instrumented. Collection of streamflow and water quality data was started.

The watersheds range in size from 172 to 380 acres and were unmined when measurements were started. Subsequently five of the watersheds have been mined; one is yet unmined.

Flow measurements have been discontinued in the three watersheds in Leatherwood. However, observations have been continuous in the Bear Branch watersheds of Jenny Fork, Miller Branch, and Mullins Fork. A complete and detailed analysis of streamflow in relation to surface mining is under way and will be reported sometime in the near future.

Because there is at present considerable interest in and discussion of the flooding during early April 1977, it seems appropriate to share some knowledge gained from our research efforts during this period. This information and discussion pertains to a case history study of the three Bear Branch watersheds and does not necessarily apply to all watersheds in Appalachia. Yet the data do provide some food for thought.

Jenny Fork is a 287-acre forested unmined watershed; Miller Branch has 190 acres, 105 of which were disturbed by surface mining. Mullins Fork contains 327 acres with 151 acres of mined land.

This case history covers a 9-day period beginning on 1 April. There was no precipitation on 1 April. Rain began at 1930 on the 2nd and ended about 2245, after 0.72" of water had fallen on the area. At about 2045 on 3 April it started raining again. Rainfall was continuous with periodic high intensities for about 26 hours ending just before midnight on the 4th after having dumped another 2.98".

The 0.72" of rain on 2 April resulted in little direct influence on stream flow; most of this water apparently went to recharge a moisture deficit in the soil. By the time the next rain started late on the 3rd, the soil was already saturated. Stream flow responded very quickly to rainfall. During periods when rainfall intensity declined, stream flow decreased rather sharply. The peak

flow came very near the end of the storm. Jenny Fork, the unmined watershed, peaked nearly twice as high as Mullins Fork and more than twice as high as Miller Branch (Mullins and Miller were the two that had substantial areas disturbed by mining).

By comparing total water yield from Jenny with that of Mullins and Miller we found that Jenny yielded nearly twice the flow of Mullins and over twice that of Miller on 4 April. Another interesting fact is that both Miller and Mullins yielded more water than did Jenny for each of the next 5 days for which computations were made. There was no additional rainfall during these 5 days.

Perhaps these phenomena can be explained as follows. The soils in the unmined watershed are relatively thin, varying generally from 1 to 3 feet. This means that water storage capacity in these soils is about 3 to 10 inches. If this storage capacity is filled, any additional water added will run off. On the other hand surface mining creates conditions whereby there are vast quantities of broken-up rock which provide potential storage space for large quantities of water. This could account for both the reduced peak flows as well as the higher depletion flow rates.

Sediment basins were constructed in Miller Branch and Mullins Fork in November 1969 shortly after mining began. Since the basins had a substantial amount of storage capacity left they could have been effective in reducing peak rates of flow and prolonging discharge through a regulated release from the relatively small headwater drainages in this study.

Soon a complete analysis will be made of our streamflow measurements taken over the past ten years. More storms will be analyzed for all seasons of the year and for many different antecedent soil moisture conditions.

Jay Hilary Kelley is Dean of the College of Mineral and Energy Resources at West Virginia University, which has the largest mining engineering enrollment in the United States. Dr. Kelley served as chairman of the commission to investigate the Buffalo Creek flood in 1973.

If it were true that man's activities on earth are the only causes of floods, then we would expect that no flooding would have occurred before civilization. However, we know this is not the case. Geological records show that considerable flooding took place long before man. Actually, man's cultural installations by and large do have some effect on flooding: some, such as deforestation, increase the frequency of flooding; others, such as the construction of dams, decrease the frequency of flooding. Surface mining can have both effects. In regions of steep terrain, the effects, either way, can be amplified considerably over flat regions.

Certainly the removal of vegetation from areas where surface mining is done would tend to increase the runoff of precipitation, and therefore increase the chances of flooding. Also, if sedimentation is accelerated so that stream beds are elevated, the water is more likely to use the flood plains for passage. However, it should be noted that sedimentation is a natural geologic process

Bob Owen



Appalachia Sounding

In April the widely acclaimed drama *Appalachia Sounding* was performed in Berea, and, if you haven't seen the show, these photos may give you an idea of what it's like. They can only suggest the reality, of course; they can't convey the richness and resonance of the live, *sounding* performance, which uses words and music to tell the human story of Appalachia through two centuries in a truly ingenious way.

Just a year ago (Spring 1976) *Appalachia Sounding* received a rave notice in these pages, and we won't repeat that review here. But for those of you who don't have a handy file of the CENTER NEWSLETTER, we'll point out that the play is sponsored by the Appalachian Regional Commission, written by Romulus Linney (with

help and advice from specialists in Appalachian speech and folklore), and produced by the Carolina Regional Theatre. And perhaps the best thing about the play is that when you see it you don't detect the tiniest sign of this bureaucratic pedigree. It's simply a good show.

This has been the second season for *Appalachia Sounding*, and we don't know what the sponsors and producers contemplate for the future. But if you're interested in having it play your community, you should write to Carolina Regional Theatre, P.O. Drawer 1169, Chapel Hill, N.C. And if you think this is a good project for the Region, you might wish to write to the Appalachian Regional Commission, 1666 Connecticut Avenue, N.W., Washington, D.C. 20235 and say so.



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and should be expected to occur in any case, surface mining or not, albeit much less if vegetation of an area is not disturbed by mining, farming, or construction.

Paradoxically, the restoration of surface-mined lands to the original contour impedes surface runoff less than does leaving the bench and highwall so that flat catchment areas are created to serve as small flood-control dams.

Taking all factors under consideration, it seems quite probable that there would have been flooding in eastern Kentucky and southern West Virginia with or without surface-mined areas, since it is clear that flooding did occur in areas where no surface mining had occurred. Not having studied the matter in great detail, I am not able to assess whether the severity of the flooding in some of the surface-mined areas was greater or less due to the mining. It seems likely that extra sedimentation in the creek beds would have increased the amount of water in the flood plains, but, again, all of the sedimentation is not due to the mining. It would seem a reasonable course of action that the sediment in the creek beds of steep valleys should be periodically removed if people insist on putting structures on the flood plains.

Child Conference

Persons from the private and the public sectors who are involved in the planning or delivery of services to children in Appalachia will meet on June 1-3 in Berea in a conference called "The State of the Child in Appalachia - 1977." Sponsors are the Berea College Appalachian Center and Save the Children Federation Appalachian Program.

The idea, say the sponsors, is "to look at needs, at programs that work, at the barriers that stand in the way of services, and at ways we can work together to improve the quality of life for families in Appalachia."

Full information is available from State of the Child in Appalachia Conference, P.O. Box 319, Berea, Ky. 40403.

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EYE on Publications

Sporty Creek, by James Still (Putnam). "A novel about an Appalachian boyhood" is the subtitle of this latest offering from the hand of one of the true Appalachian masters. Actually, the story is the sum of reworked, previously published parts - a fact that is not likely to disturb Still admirers. As the book's publishers say, "Mr. Still has a knowledge of life that transcends sociology." Yes, indeed.

Folk Songs from the West Virginia Hills, collected and annotated by Patrick W. Gainer (Seneca Books). A double-purpose book: a songbook for those who like to sing for fun, a reference book for teachers and scholars. The collector of these songs, who grew up hearing his grandfather sing many of them, has himself recorded a number of them, and, according to Ruel E. Foster of West Virginia University, "to get the full pleasure from the songs in the book one should hear Dr. Gainer sing them." If you don't have that chance, however, you still have 108 songs here to choose from yourself.

Le's Whittle Awhile, by Jim Perry with Betsy White (Era Press). In 1939 a 44-year-old Columbia, S.C., lawyer gave up a successful practice, electricity and running water to move to Sky Valley in North Carolina in search of peace and harmony. "It's been a wonderful life," he says, "and the best part of it is that I'm still here, at 80. If I'd stayed in the rat race, I don't believe I would have made it to 50." The book lightly chronicles the development of his relationships with the Blue Ridge people.

Remembering James Agee, edited by David Madden (Louisiana State University Press). The late poet, journalist, screen writer (*African Queen*) and author of *A Death in the Family* is remembered in essays by editors, other writers and friends and in pictures (including some by Agee's great collaborator Walker Evans).

New Ground, co-edited by Donald Askins and David Morris (Southern Appalachian Writers' Co-operative/Mountain Review). "Daybreak is coming to the Cumberland" say the editors of this anthology, which is offered as both evidence and product of the renaissance. The contributors are widely known and not so widely known; among the former are Gurney Norman, Jim Wayne Miller and Lillie Chaffin.

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