

References and Notes

- W. E. LeGros Clark, *Proc. Am. Phil. Soc.* **103**, 159 (1959).
- A few taxonomic terms used in this article may require definition for the general reader: Dryopithecinae, a subfamily of pongids which includes several species of Miocene-Pliocene "apes"; Hominidae, the family of man and his immediate forerunners; Hominoidea (hominoids), a superfamily which includes the great apes and man, living and fossil, but excludes monkeys; Pongidae, the family of the fossil and living great apes. The term "Primates" is capitalized when the order Primates, as a major mammalian subdivision, is intended; "primates" (not capitalized) means some, but not all, members of this order.
- T. Dobzhansky, *Sci. Am.* **208**, 169 (1963).
- G. G. Simpson, *Am. J. Sci.* **40**, 413 (1940).
- A. Remane, *Arch. Naturgeschichte* **87**, 1 (1922); A. Remane, in *Primatologia*, Hofer, Schultz, Starck, Eds. (1960), vol. 3, p. 637; W. K. Gregory and M. Hellman, *Anthropol. Papers Am. Museum Nat. Hist.* **28**, 1 (1926); A. Schultz, *Am. J. Phys. Anthropol.* **2**, 1 (1944).
- E. Mayr, *Cold Spring Harbor Symp. Quant. Biol.* **15**, 109 (1950).
- , *Am. Naturalist* **74**, 249 (1940); T. Dobzhansky, *Am. J. Phys. Anthropol.* **2**, 251 (1944).
- My conclusions are documented at greater length in a monographic analysis of dryopithecines now in preparation.
- L. S. B. Leakey, *Ann. Mag. Nat. Hist.* **13**, 689 (1962).
- D. A. Hooijer, *Ann. Musee Roy. Afrique Central, Tervuren*, in press.
- K. P. Oakley, *Advan. Sci.* **18**, 415 (1962).
- J. F. Evernden, D. E. Savage, G. H. Curtis, G. T. James, *Am. J. Sci.*, in press.
- E. L. Simons, *Genetic and Evolutionary Biology of the Primates* (Academic Press, New York, in press), chap. 2.
- A. T. Hopwood, *J. Linnean Soc. Zool.* **38**, 31 (1933).
- D. M. S. Watson, *Am. Scientist* **41**, 427 (1953).
- R. F. Ewer, *Advan. Sci.* **18**, 490 (1962).
- A. T. Hopwood and J. P. Hollyfield, *Fossil Mammals of Africa*, *Brit. Museum (Nat. Hist.)* **8**, 1 (1954).
- E. H. Colbert, *Trans. Am. Phil. Soc.* **26**, 376 (1935).
- G. E. Pilgrim, *Records Geol. Surv. India* **45**, 1 (1915).
- Although several present-day species of *Macaca* surely must be valid—that is, genetically isolated—it is of some interest to observe that most of these living "species" of the genus *Macaca* have not been shown by cross-breeding experiments to be distinct species [see A. P. Gray, *Mammalian Hybrids* (Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh, 1953)].
- J. Piveteau, *Traite Paleontol.* **7**, 167 (1957).
- J. F. de V. Comella and M. C. Pairo, *Bol. Inst. Geol. Espan.* **91**, 1 (1947).
- Personal communication, and Yale Peabody Museum records.
- G. E. Pilgrim, *Mem. Geol. Surv. Ind.* **14**, 12 (1927).
- , *Records Geol. Surv. Ind.* **40**, 63 (1910).
- W. K. Gregory, *Origin and Evolution of the Human Dentition* (Williams and Wilkins, Baltimore, 1922), vol. 1, p. 548.
- F. C. Howell, *Science* **130**, 831 (1959).
- M. F. Ashley Montagu, in T. H. Huxley, *Man's Place in Nature* (Univ. of Michigan Press, new ed., 1959), intro.
- I am currently engaged in a taxonomic revision of Dryopithecinae, based on direct study of nearly all known European, African, and Indian materials.
- W. K. Gregory, M. Hellman, G. E. Lewis, *Carnegie Inst. Wash. Publ.* **495** (1938), p. 1; E. L. Simons, *Postilla* **57**, 1 (1961).
- J. E. Frisch, *Anthropol. Anz.* **25**, 298 (1962).
- E. Zuckerkandl, R. T. Jones, L. Pauling, *Proc. Natl. Acad. Sci. U.S.A.* **46**, 1349 (1960); M. Goodman, *Ann. N.Y. Acad. Sci.* **102**, 219 (1962).
- G. E. Lewis, *Am. J. Sci.* **34**, 139 (1937).
- R. Forteau, *Ministry of Finance, Survey Department, Cairo* (1920), vol. 1.
- W. L. Straus, Jr., *Clin. Orthopaed.* **25**, 9 (1962).
- W. E. LeGros Clark, *The Fossil Evidence for Human Evolution* (Univ. of Chicago Press, Chicago, Ill., 1955).
- In addition to major finds in Olduvai Gorge, Tanganyika, and the Transvaal, South Africa, the reported assignments of fossils to the Australopithecinae and specifically to *Australopithecus* (subgenera *Australopithecus* and *Paranthropus*) are as follows. (i) Stekelis *et al.*, *Bull. Res. Council Israel Sect. G* **9**, 175 (1960), teeth found in association with a Villafranchian fauna at Tell Ubeidiya, Jordan Valley, Israel; (ii) Y. Coppen, *Compt. Rend.* **252**, 3851 (1961), *Australopithecus* cranial fragment found near Largeau, Lake Chad, North Africa; J. T. Robinson, *Am. J. Phys. Anthropol.* **11** (1953), transfer of Javan "*Meganthropus*" to *Australopithecus* (subgenus *Paranthropus*); G. H. R. von Koenigswald, *Koninkl. Ned. Akad. Wetenschap. Proc. B60*, 153 (1957), description of *Australopithecus* (= *Hemianthropus*) *peii*, from China.
- J.-K. Woo, *Palaeontol. Sinica* **146**, 1 (1962).
- I thank the Wenner-Gren Foundation of New York and the board of the Boise fund of Oxford University for financial support in the preparation of this article. I also thank W. E. LeGros Clark, A. L. McAlester, B. Patterson, C. L. Remington, M. C. McKenna, and W. L. Straus, Jr., for critical reading of the manuscript. Illustrations were prepared by Mrs. Martha Erickson.

News and Comment

Appalachians: How a Have-Not Region and People Got That Way Conditions Development Efforts

A book written with indignation and rhetoric reminiscent of the muck-raker journalists who attacked injustice, indifference, and "the interests" earlier in the century has helped to call attention to the perennial problems of the Appalachian region, which has been generally left behind in the advance of American science and industry.

Night Comes to the Cumberlands (Atlantic-Little, Brown, Boston, 1963, \$6.75) is a book about the mountain counties of eastern Kentucky, the 10,-

000 square miles of rugged hills and narrow valleys on the Cumberland Plateau bordering Virginia, West Virginia, and Tennessee, a land of persistent hard times shared by similar areas in states lying north and south along the Appalachian range.

The author is Harry M. Caudill, an attorney who lives in Whitesburg in Letcher County on the plateau. Caudill was raised in the mountains, he has practiced law on the county courthouse circuit, and he has served in the Kentucky legislature, where he made education and conservation his cause.

Caudill writes from inside, and he writes with his eye unwaveringly on the people of the area, particularly

the miners and their families, for the story of eastern Kentucky for the last half century in good times and bad has been the story of coal.

The subtitle of the book is "A Biography of a Depressed Area," and Caudill starts with the beginning, tracing the troubles of the present to the conditions of the settlement of the region which began more than 200 years ago. Caudill writes like a cured romantic, and his pioneers are not Arcadians. The mountaineers of today are the descendants of the men and women who started the western migration from Virginia and North Carolina. For the most part, says Caudill, these people were of English and Scottish stock, but they were the strays and outcasts—orphans, debtors, fugitives—the transported criminals or indentured servants who came to work on the plantations to fill the same need for labor that kept the slave ships coming from Africa.

Many of these people who had worked out their indentureships, or had simply run away, went to the foothills of the Piedmont, and by the latter half of the 18th century were established in the fringes of the Appalachians.

They moved across the mountains following the game trails, through the Cumberland Gap and the other passes into the new territory. Their lives in Europe and on the plantations had given them few of the airs and graces and, in fact, few of the arts and skills of civilization. They met the Indian on his own ground, fighting him with equal savagery and superior weapons. The backwoodsmen were a superbly hardy and independent breed. Many of them kept going West, furnishing the Daniel Boones and Jim Bridgers and Kit Carsons. But many of the mountaineers settled in the Appalachians, scattering over hills and coves, living, eating, and farming like the Indians they had vanquished, and preserving for many years the conditions of the frontier.

The Civil War brought a division of loyalties in the mountain counties which was to leave a bloody legacy. In general, says Caudill, slaveowners and their relatives tended to side with the Confederacy and those who did not own slaves upheld the Union. The mountains sent many men to be soldiers, as they have in other wars, and as the North and South fought on, the conflict spread to eastern Kentucky, with neighbor set against neighbor and family against family. The pattern of attack and retaliation and the mountaineers' pride and penchant for revenge kindled the blood feuds which were carried on for 50 years after Appomattox.

The mountains in this period were still deeply isolated, and Caudill notes the failures of civil government and the prevailing anti-intellectualism of the times and actually laments the bypassing of the mountains by the carpetbaggers. "In these years, so eventful in the conquered Confederacy," he writes, "the ancient dearth of leadership persisted in Kentucky—a dearth made inevitable, perhaps, by a society whose every member is so individualistic that he would follow his own impulses alone, and rarely anything else."

One cost of the feuds, which plunged some mountain areas into virtual anarchy, was the loss of the energetic and ambitious young who left the plateau to break out of the circle of violence and vengeance. This loss of the best stock in wars and feuds and by emigration has been a major factor in the sapping of the human resources of the region.

The quickening pace of industriali-

zation in the North in the latter half of the 19th century spurred interest in the rich natural resources of the plateau, and the speculators moved into the mountains, buying timber and mineral rights from the mountaineers. Some lumbering had been done from the early part of the century, but the task of transporting the logs down the creeks and rivers had limited the operation. But now the demand grew and the pace quickened and the mountaineers got money for their trees and jobs with the lumber companies. At the end of the 19th century the face of the Cumberland Plateau had changed little, but the mountaineer no longer owned the trees over his head or the minerals under his feet.

The coming of the railroads in the first decade of the 1900's brought the end of the old frontier.

The First Boom

Life was transformed as the mountaineers became miners, moved into the mining camps—company towns served by the company store—and resigned their fates to the absentee owners and the price of coal. Some companies were benignly paternalistic, providing good houses, better schools than the mountains had ever seen before, and even decent health services. Most companies were not. And Caudill emphasizes that the influence of the companies with the county and state governments was great enough to keep taxes on their operations so low that the county and local governments were able to provide only the most meager services and in many cases were even unable to enforce the law where the companies' interest might be adversely affected.

A boom in coal which carried through World War I brought prosperity, in relative terms, to the miners, to the loggers who cut timber for rail ties and props for the mine tunnels, and even to the farmers who raised food to sell in the mining camps. Then in the late 1920's the coal fields got a foretaste of the Depression, and the layoffs in the mines began. By this time the effects of the coal boom on the land itself were plain. The primeval forests were gone and where fire and erosion had not devastated the hills only scrub and ragged second growth trees stood. Primitive farming methods had worn out the soil. Spoil from the mines and sewage from the towns polluted the creeks. And most of the mining

camps, with their jerrybuilt houses, weathered and sagging, were dismal and unhealthy places.

The Depression brought mass unemployment to the mountains, and when state and local government were unequal to the task, the mountaineers turned to the federal relief agencies for the necessities of life. Where the mines still operated, the hard-driven companies cut wages again and again, depending on recruits from the army of unemployed to work for whatever pay was offered. It was in these desperate days of the 1930's that the great union organizing drives spread across the mountains. In many parts of the plateau the mining companies literally were the law, and armed miners faced company police, state troopers, and even the militia on picket line after picket line. Unionism was taken up with an almost religious fervor by the mountaineers, and by the end of the '30's John L. Lewis and his United Mine Workers were triumphant through most of the Appalachian coal fields.

The second coal boom, which began with the opening of the new World War, sealed the victory of the United Mine Workers. Wages went higher and higher, and the union's welfare and pension funds gave a new security to the miners. But these good new days for the miners were short-lived. After the war competition from other fuels—oil, natural gas, the prospect of nuclear power—put pressure on the coal industry. Faced with this competition and rising labor costs, the larger coal companies with the richer mines began to invest heavily in mining machinery. Thus, just as the Depression had come early to the mines, so did automation. And the tide turned against the miners, permanently, it seemed to many. The fortunate minority who had jobs in the mechanized "rail mines" were, in effect, technicians, and they could look ahead to steady employment. Others worked in the marginal "truck mines," small operations in which a few men work poorer seams of coal and where the work is hard and dangerous and the pay low.

For many there is no work at all in the mines, and mining is all they know. Just as so many of the miners were cut off from jobs, they were also cut off from the union in which they put their allegiance and faith, for the economics of the new crisis forced the United Mine Workers to call in the welfare and pension cards of many of the min-

ers outside the big operations. Last year, to reduce the drain on its treasury, the union closed four of its splendid hospitals in the coal fields.

The last chapter of Caudill's story is one of discouragement and demoralization. Chronic unemployment and the expansion of federal welfare legislation combined to make the conditions of life for a great many mountain families a combination of poverty and dependency. Federal-state relief programs in the 1930's was permeated with politics, and the foundation for a system of welfare politics was established. The mountaineers distrusted state and local governments, which seemed to exist mainly to protect the property rights and interests of the mining companies. The federal government had meant mainly the revenueurs who tried to interfere with their manufacture of "untaxpaid" whiskey, which the mountaineers regarded as an ancestral right and a legitimate cash crop.

With jobs gone, a large segment of the mountain population has become dependent on welfare programs, many using artful dodges to qualify. A new economy based on surplus food distribution, old-age assistance, aid to dependent children, unemployment and disability insurance, and Social Security payments has grown up. With incentives gone, the plateau seems a place of exhausted land and exhausted people.

The exodus from the mountain counties continues, and the best continue to go, as they have gone in the past, in war and peace, prosperity and depression. But those who leave face lengthening odds in the increasingly competitive labor market.

The Disadvantaged

Caudill tells the story of the mountain family who made sacrifices to send a son through high school so that he might have a better chance. When the boy went to California, he found that prospective employers did not accept a Kentucky high school diploma as proof of a regular high school education. When he took an equivalency test he flunked it. Caudill notes that tests in 1960 of graduates from a high school in Harlan County—which has one of the section's bigger and better school systems—showed that Harlan graduates tested 3 years 5 months behind the national average.

Scientific and technical manpower has become a fairly reliable index to

regional prosperity. A recent National Science Foundation study, for example, shows that half of the nation's scientists and engineers work in six states—California, Illinois, New Jersey, New York, Ohio, and Pennsylvania. Kentucky is in the lowest of four groupings of states, and the concentrations of specialized manpower in and around Louisville and Lexington and near Cincinnati mask the dearth of professionals in the mountains.

The shape of the future is suggested by estimates of geographic trends such as those in the recent President's Manpower Report, which predicted that in Florida, for example, the labor force will rise by 67 percent in this decade, and in California, by 50 percent. Kentucky is one of nine states in which the labor force is expected to grow 5 percent or less. Arkansas and Virginia are expected to show declines.

Eastern Kentucky, then, is a study in the deprivation of talent. Able young people leave the plateau, and those who remain and manage to stay in school are cheated by an inferior education system.

In part, the problem is simply one of economics, for Kentucky is a relatively poor state by any of the standard measurements. But, as Caudill points out, the natural disadvantages of the state have in the past been increased by an intermixture of education and politics.

In Kentucky, as in other nonindustrial states, especially in the South, the county school system and the highway office may well provide the biggest payrolls in a rural county, and these two payrolls are often the wellsprings of political power. Where jobs are scarce, jobs as teachers and janitors and bus drivers are sought after, and they are not always awarded on the strictest criteria of merit. The county superintendent of schools is the kingpin of the school system in Kentucky. He is hired by an elected county school board, but it is the superintendent who hires and fires, and buys and sells for the school system, and in fact, in many Kentucky counties, the school board members are the superintendent's men.

Because of the patronage possibilities open to the superintendents, many of them are deeply involved in county and state politics, and in Kentucky politics, in which power is decentralized among the 120 counties, it is fair to say that there is a schoolhouse gang as well as a courthouse gang.

While many Kentucky educators and politicians have deplored and opposed mixing education and politics, there is no doubt that the public education system—and that includes the state institutions of higher education—has been affected by it. And the mountain schools have probably suffered most severely.

Caudill himself was centrally involved in an attempt at a general reform of the system. In 1960, when the legislature passed a 3-percent sales tax and voted a massive increase in state funds for education, a good many of the state legislators felt untypical qualms over whether the state funds would really have the effect of improving education. And the result was the creation by the State House of Representatives of a special committee to investigate education. A scandal over charges of a county superintendent's misuse of school funds spurred the committee on.

The Caudill Committee

Caudill was chairman of this panel, and the committee came up with a report, sternly critical of Kentucky education, in which it noted, "a powerfully entrenched political machine can grow up within the framework of the local school system and we believe that this has, in fact, occurred in the greater number of Kentucky counties."

Out of the committee investigation came a Commission on Public Education, a panel of distinguished citizens appointed by the Governor and with a majority of members who were not educators. This effort to give nonprofessionals a direct role in criticizing the education system and influencing educational policy was resisted to some extent by professional educators in general. But the real opposition to the commission's proposals for reform, based on a series of studies of administration, standards, and curriculum, has come from the educational administrators with political power.

The current chairman of the commission last week complained that the commission's recommendations have not been followed, and the Louisville *Courier-Journal* then pointed the editorial finger of blame at the State Department of Education and the chief state school officer, who is an elected official in Kentucky and is generally felt to owe his post and his power to the education lobby.

Shortcomings in education are, of

course, only one of the problems facing eastern Kentucky and areas like it in the Appalachians. Coal mining and its subsidiary activities have dominated the economy. The rough terrain is an isolating factor, and the power and communications systems in the area are poorly developed.

Development of the Appalachian area, however, is now getting more serious attention than it ever has before.

John F. Kennedy seems to have been lastingly disturbed by what he saw, in 1960 as he campaigned in the hills of West Virginia, a state which gave him a crucial primary victory.

In Congress, Representative Carl D. Perkins (D-Ky.), whose district includes the northeastern tier of the coal counties of the plateau, has been working with what he feels is increasing effectiveness for a major resource and economic development program for the Appalachian Highlands area.

Perkins's bill provides for the formation of an Appalachian Highlands Commission composed of federal agencies and representatives appointed by the governors of the 11 states in the region. This commission would formulate plans for the development of the area, and Perkins hopes that an interstate compact would be eventually formed by the Appalachian states to facilitate development. The development plan would include improved flood-prevention and flood-control measures and a whole range of industrial and community development, conservation, and public health programs.

Assessing the Problem

In April, a President's Appalachian Regional Commission (PARC) was set up, with Franklin D. Roosevelt, Jr., Under Secretary of Commerce, as chairman. The Conference of Appalachian Governors and the federal government's Area Redevelopment Agency apparently urged that a special regional development program is required if the region is to offer adequate opportunities to its inhabitants and is to contribute more to the national economy.

A number of team surveys on different subjects—transportation, water resources, human resources, and so on—are under way now, and reports are scheduled to be submitted, along with recommendations for action, to the President by 1 January. Formulation of a comprehensive development program is to follow.

Besides Kentucky, the states now included in PARC are Alabama, Georgia,

Maryland, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia.

Caudill, in his book, calls for a regional development effort modeled on the Tennessee Valley Authority, though the precedent of T.V.A. may not be directly applicable, since the "miracle of T.V.A." was based on the production of low-cost hydroelectric power and there seem to be few major undeveloped waterpower sites in the region.

When Caudill calls for a major resettlement of the mountaineers he broaches a highly sensitive political subject. He argues that the population is too large and thinly spread, and that "metropolitanization" would make it possible to give people better housing, education, and opportunities for jobs. He adds that surplus workers should be trained and relocated in more prosperous areas. However reasonable the idea, such action by government is not popular with the voters, and relocation has been regarded as a fatal word politically.

Caudill's book has been criticized on and off the record, by those who know the region and its history, for exaggerations and oversimplifications. Scholars of the Western migration and settlement apparently may take exception to some of his generalizations. And Eastern Kentuckians may resent his picture of their past and present. Caudill has some prior experience as a critic not greatly honored in his own country and is unlikely to be deterred.

But the area planners can read Caudill's book with profit. By portraying the troubles of today as the harvest of history, he suggests the depth of the problems afflicting the region.

Federal participation in the redevelopment program, no matter how massive, must be done in full cooperation with state and local and private agencies. And to do what seems necessary to transform the Appalachians would appear to require an almost miraculous change of heart among many state legislators, county officials, and influential private citizens.

For Caudill may have struck the heart of the problem near the end of his book when he discusses, without brimming optimism, the task facing a Southern Mountain Authority. "To modernize the plateau," says Caudill, "the authority would have to tackle the complex tasks of modernizing the units of government which control its public affairs."—JOHN WALSH

Enovid: Contraceptive Pill and Recent FDA Report Clearing It Stir Continued Medical Dispute

The hope of the Food and Drug Administration that, by seeking the advice of a panel of medical experts, it could settle the controversy surrounding the oral contraceptive Enovid is not about to be fulfilled. On the contrary, the report of the special committee, headed by Irving S. Wright of Cornell Medical College, and FDA's decision, based on the report, to sanction continued prescription sale of the pill, have left as much medical uneasiness as they have quieted.

At issue is a question that has been raised about Enovid since it came into use as a contraceptive in the summer of 1960—namely, whether there is a relationship between use of the drug and thromboembolic conditions (blood clots). The Wright committee found insufficient statistical data to permit an evaluation of the overall relation between Enovid and thromboembolism, but it was able to analyze the relation between use of Enovid and deaths resulting from thromboembolic conditions. The committee, though it stressed the paucity of statistics and asked that its results be accepted with caution, found that death rates from thromboembolism appeared to be significantly higher for users than for nonusers of Enovid above the age of 35 (*Science*, 16 August, p. 621).

After receiving the report, the FDA extended from 2 to 4 years the period for which use of Enovid is recommended, and it also requested G. D. Searle, the manufacturer, to make certain changes in its medical literature regarding the drug. In the same statement, issued on 4 August, the FDA announced that available data on the long-term effects of Enovid left something to be desired, and it suggested that further studies with the drug be begun.

A possible discrepancy between the Wright report and the agency's action was noted in this space on 16 August. Since then, the report itself has come under criticism, principally from a few independent practicing physicians who found that it did not tally with their own experiences with Enovid. The critics are not a united band, but separate individuals who find themselves on common ground with regard to the Wright report: they disagree with its methods, question the com-