resistance is still unknown. However, the properties of resistance of cultured cells to MTX, including (i) a stepwise selection of progressively resistant cells; (ii) an increase in a specific protein present at low levels in sensitive cells, which, when present in larger amounts, results in resistance; and (iii) stable or unstable resistance in the absence of selection pressure, have analogies both in antibiotic (*31*) and insecticide resistance (*32*). Recently Normark *et al.* (*33*) have, in fact, shown that penicillin resistance in *E. coli* K_{12} obtained by stepwise selection results in chromosomal amplification of the gene for β-lactamase (penicillinase).

Our studies with MTX resistance provide further rationale for the principles of drug therapy (whether for bacteria, malignancies, or insects), including the use of multiple drugs, each in sufficient amounts to effect killing separately; treatment for only as long as necessary and with drugs not retained in the environment; and use of a second set of multiple drugs if resistance develops (*1*, *34*). On the basis of the concept of gene amplification as a mechanism of drug resistance, the drugs used should not be counteracted by amplification of a single DNA sequence. Our results suggest that the prolonged administration of a single drug in ever increasing concentrations, which is retained in the environment, is precisely that form of administration most likely to result in amplification of genes in a stable state, thereby imparting stable resistance.

References and Notes

1. A. Goldstein, L. Aronow, S. M. Kalman, *Principles of Drug Action* (Wiley, New York, 1974), chap. 8.
2. J. R. Bertino, D. M. Donohue, B. Simmons, B. W. Gabrio, R. Silber, F. M. Huennekens, *J. Clin. Invest.* **42**, 466 (1963).
3. W. C. Werkheiser, *J. Biol. Chem.* **236**, 888 (1961).
4. G. A. Fischer, *Biochem. Pharmacol.* **7**, 75 (1961).
5. M. Freidkin, E. J. Crawford, S. R. Humphreys, H. Goldin, *Cancer Res.* **22**, 600 (1962); J. P. Perkins, B. L. Hillcoat, J. R. Bertino, *Mol. Pharmacol.* **5**, 213 (1969).
6. M. T. Hakala, S. F. Zakrezewski, C. H. Nichol, *J. Biol. Chem.* **236**, 952 (1961).
7. J. W. Littlefield, *Proc. Natl. Acad. Sci. U.S.A.* **62**, 88 (1969).
8. A. Albrecht, J. L. Biedler, D. J. Hutchison, *Cancer Res.* **32**, 1539 (1972).
9. W. E. Flintoff, S. V. Davidson, L. Siminovitch, *Somatic Cell Genet.* **2**, 245 (1976).
10. G. A. Fischer, *Biochem. Pharmacol.* **11**, 1233 (1962); F. M. Sirotnak, S. Kurita, D. J. Hutchinson, *Cancer Res.* **28**, 75 (1968).
11. W. F. Flintoff, S. M. Spindler, L. Siminovitch, *In Vitro* **12**, 749 (1976).
12. F. W. Alt, R. E. Kellems, R. T. Schimke, *J. Biol. Chem.* **251**, 3063 (1976).
13. U. J. Hanggi and J. W. Littlefield, *ibid.*, p. 3075.
14. F. W. Alt, R. E. Kellems, J. R. Bertino, R. T. Schimke, *ibid.* **253**, 1357 (1978).
15. R. J. Kaufman and R. T. Schimke, in preparation.
16. R. J. Kaufman, J. R. Bertino, R. T. Schimke, *J. Biol. Chem.* **253**, 5852 (1978).
17. R. P. Anderson and J. R. Roth, *Annu. Rev. Microbiol.* **31**, 473 (1977); W. R. Folk and P. Berg, *J. Mol. Biol.* **58**, 595 (1971); S. W. Emmons, V. MacCoshan, R. L. Baldwin, *ibid.* **91**, 133 (1975); A. H. Sturtevant, *Genetics* **10**, 117 (1925); K. D. Tartoff, *Annu. Rev. Genet.* **9**, 370 (1975).
18. R. P. Anderson, C. G. Miller, J. R. Roth, *J. Mol. Biol.* **105**, 201 (1976).
19. G. P. Smith, *Cold Spring Harbor Symp. Quant. Biol.* **38**, 507 (1973); S. Wolff, *Annu. Rev. Genet.* **11**, 183 (1977).
20. W. O. McBride and H. L. Ozer, *Proc. Natl. Acad. Sci. U.S.A.* **70**, 1258 (1973); K. Willecke and F. H. Ruddle, *ibid.* **72**, 1792 (1975); D. A. Spandidos and L. Siminovitch, *Cell*, in press.
21. A. Hinnen, J. B. Hicks, G. R. Fink, *Proc. Natl. Acad. Sci. U.S.A.*, in press.
22. K. D. Tartoff, *Annu. Rev. Genet.* **9**, 370 (1975).
23. D. Hourcade, D. Dressler, J. Wolfson, *Cold Spring Harbor Symp. Quant. Biol.* **38**, 537 (1973).
24. J. L. Biedler and B. A. Spengler, *Science* **191**, 185 (1976).
25. J. H. Nunberg, R. J. Kaufman, R. T. Schimke, G. Urlaub, L. A. Chasin, *Proc. Natl. Acad. Sci. U.S.A.*, in press.
26. S. N. Cohen, *Nature (London)* **263**, 731 (1976).
27. M. Sinensky, *Biochem. Biophys. Res. Commun.* **78**, 863 (1977).
28. M. Meuth and H. Green, *Cell* **3**, 367 (1974).
29. T. D. Kemp, E. A. Swyryd, M. Bruist, G. R. Stark, *ibid.* **9**, 541 (1976).
30. G. N. Wahl, P. A. Padgett, G. R. Stark, in preparation.
31. M. Demerec, *J. Bacteriol.* **56**, 63 (1948); V. Bryson and S. Szybalski, *Adv. Genet.* **7**, 1 (1955); D. Perlman and R. H. Rownd, *J. Bacteriol.* **123**, 1013 (1975); M. Demerec, *Proc. Natl. Acad. Sci. U.S.A.* **31**, 16 (1945); K. D. Eriksson, H. G. Bowman, J. A. T. Jansson, S. Thoren, *J. Bacteriol.* **90**, 54 (1965); A. S. Breeze, P. Sims, K. A. Stacey, *Genet. Res.* **25**, 207 (1975).
32. W. D. McEnroe and A. Lakocy, *J. Econ. Entomol.* **62**, 283 (1969); M. W. Service, *J. Trop. Med. Hyg.* **67**, 190 (1964); G. P. Georghian, *Annu. Rev. Entomol. Syst.* **3**, 133 (1972); L. C. Terriere, *Annu. Rev. Entomol.* **13**, 75 (1968); M. Tsukamotom, *Residue Rev.* **25**, 289 (1969); L. Gil, *Entomol. Exp. Appl.* **11**, 15 (1968); J. Sternbury, *J. Agr. Food. Chem.* **2**, 1125 (1954); A. Grigoio and F. J. Oppenworth, *Genetica* **37**, 159 (1966); V. Thomas, *J. Econ. Entomol.* **59**, 779 (1966); J. F. Crow, *ibid.* **47**, 393 (1954); J. C. King, *ibid.*, p. 387; C. R. Walker and L. C. Terriere, *Entomol. Exp. Appl.* **13**, 260 (1970).
33. S. Normark, T. Edlund, T. Grundstrom, S. Bergstrom, H. Wolf-Watz, *J. Bacteriol.* **132**, 912 (1977).
34. J. R. Bertino and R. E. Skeel, *Pharmacologic Basis of Cancer Chemotherapy* (Williams & Wilkens, Baltimore, 1974), p. 681.

35. Supported by grants from the American Cancer Society (NP 148) and the Cancer Institute (CA-16318).

A Proposal to Modernize the American Antiquities Act

Robert Bruce Collins and Dee F. Green

The Act for Preservation of American Antiquities became law in June 1906 (*1*). The act was passed during a time in U.S. history when people first began to realize that the American frontier, celebrated in Frederick Jackson Turner's epochal paper (*2*), was not endless, and that the time had come to conserve the nation's natural resources and preserve its historical and archaeological heritage. Since the 1890's there had been great public interest in the art and history of the Indians of the southwestern United States, and this interest had created a great demand for authentic prehistoric artifacts. As a result, ruins and cliff dwellings, such as Casa Grande, Mesa Verde, and Chaco Canyon, were indiscriminately excavated and vandalized. There were no state and federal laws that provided for the protection of prehistoric sites, and there were few professional archaeologists. Thus, the need for protective legislation was particularly acute when the Antiquities Act was passed in 1906.

The act, which was codified in section 433, title 16 of the U.S. Code, prohibited the appropriating, excavating, injuring, or destroying of any "historic or prehistoric ruin or monument" or "object of antiquity" found on government-owned or -controlled land, without the permission of the secretary of the department of the government having jurisdiction over the land (*3*). The act was drafted and presented first to the American Anthropological Association and the Archaeological Institute of America by the archaeologist Edgar Lee Hewett. Hewett's draft bill was introduced in the House of Representatives and the Senate in early 1906, and after passage it was signed into law by President Theodore Roosevelt.

The legislative history of the Antiquities Act—that is, the record of debates and reports on the bill in committees and

R. B. Collins is assistant U.S. attorney for the district of New Mexico, Federal Courthouse, Albuquerque, New Mexico 87103. D. F. Green is regional archaeologist for the southwestern region of the U.S. Department of Agriculture Forest Service, Albuquerque 87102.

0036-8075/78/1208-1055$01.25/0

on the House and Senate floors—provides little insight into the intended breadth of the statute. The legislative history is important because courts look to it in interpreting the meaning of laws. However, the Senate report indicates that the purpose of the bill was the preservation of

Summary. The Antiquities Act of 1906, which has provided the legal basis for protecting the U.S.'s prehistoric and historic heritage, is no longer adequate. Artifact hunters and collectors have descended on national forests and U.S. parks in ever-increasing numbers. The drafters of the 1906 act could not have anticipated the lucrative market in prehistoric artifacts in the 1970's. The act has come under attack in the courts as being unconstitutionally vague. In light of the recent criminal prosecutions under the Antiquities Act and the constitutional challenges, reviewed in this article, the authors propose a new Antiquities Act which expands the scope of the act to include those who would deal in artifacts taken unlawfully from federal lands and increases the criminal penalties for a violation of the act.

"relics." The entire report is less than a page and the important language is less than a sentence (*4*):

> . . . in view of the fact that the historic and prehistoric ruins and monuments on the public lands of the United States are rapidly being destroyed by parties who are gathering them as relics and for the use of museums, colleges, etc., your committee are of the opinion that their preservation is of great importance.

The remaining legislative history is found in the House debate on the bill. Representative John Lacey, who introduced the bill in the House, stated that the object of the bill "is to preserve these old objects of special interest and the Indian remains in the Pueblos in the Southwest . . ." (*5*).

Archaeologists, historians, and paleontologists have relied on the act as the legal basis for protecting cultural and fossil resources. Despite the passage of additional legislation in 1935, 1966, and 1974 which regulates cultural resources on federal lands, the 1906 act remains the only piece of legislation which imposes criminal penalties for actions detrimental to the preservation of these resources.

Review of Cases

The first reported challenge to the Antiquities Act came nearly 70 years after its passage in the case United States *v.* Diaz (*6*, *7*). In the Diaz case, an Arizona attorney and expert on Apache Indian culture observed certain authentic Apache religious artifacts on display in a storefront window in Scottsdale, Arizona. The attorney learned the artifacts were owned by Ben Diaz and contacted Diaz to inquire as to the price of the artifacts. Diaz told the attorney during a telephone conversation that he had found approximately 22 face masks, headdresses, ocotillo sticks, bull-roarers, fetishes, and mud dogs in a medicine man's cave on the San Carlos Indian reservation. The attorney offered to purchase the items from Diaz for $1200, but Diaz rejected the offer as too low. Five days later two undercover agents of the Federal Bureau of Investigation visited Diaz at his home and indicated that they were interested in buying artifacts that he had for sale. When Diaz showed them the artifacts, they proceeded to identify themselves as FBI agents and placed him under arrest.

Diaz was charged in U.S. magistrate's court for the District of Arizona with appropriating "objects of antiquity situated on lands owned and controlled by the Government of the United States without the permission of the Secretary of Interior," in violation of the Antiquities Act. During the trial before the federal magistrate, a medicine man from the San Carlos Indian Reservation identified the face masks as having been carved 3 or 4 years before the trial by another medicine man personally known to him. Keith Basso, a professor of anthropology at the University of Arizona, testified as an expert that the anthropological term "object of antiquity" could include something that was made just yesterday if related to religious or social traditions of long standing (*6*, p. 858).

The magistrate found Diaz guilty and fined him $500. Diaz immediately appealed the decision to the U.S. district court for the District of Arizona, the next higher federal court, arguing, among other things, that the lower court had erred in holding that any object less than 5 years old was an object of antiquity. In affirming the judgment, the district court agreed that age should not be the sole determinant of whether something is classified as an antiquity. Although it is highly unlikely that Congress, in passing the Antiquities Act, intended items 3 or 4 years old to be so classified, the court wrote "[i]n a case such as this, there can be no specific definite time limit as to when an object becomes an 'antiquity.' The determination can be made only after taking into consideration the object or objects in question, the significance, if any, of the object, and the importance the object plays in a cultural heritage" (*6*, p. 858).

Diaz appealed the district court's decision to the Circuit Court of Appeals for the Ninth Circuit on the ground that items 3 or 4 years old should not come within the scope of the Antiquities Act (*8*). The court of appeals accepted the interpretation of "object of antiquity" adopted by the district court below and, rather than attempt to define judicially the language of the statute, declared the statute unconstitutional for failing to give sufficient notice of the conduct proscribed. In holding that the Antiquities Act was unconstitutionally vague, the circuit court stated (*8*, p. 115):

> Protection [provided by the act], however, can involve resort to terms that, absent legislative definition, can have different meanings to different people. One must be able to know, with reasonable certainty, when he has happened on an area forbidden to his pick and shovel and what objects he must leave as he has found them. Nowhere here do we find any definition of such terms as "ruin" or "monument" (whether historic or prehistoric) or "object of antiquity." The statute does not limit itself to Indian reservations or to Indian relics. Hobbyists who explore the desert and its ghost towns for arrowheads and antique bottles could arguably find themselves within the act's proscriptions.

The 1974 circuit court decision effectively wrote the Antiquities Act out of the United States Code in the Ninth Circuit. Consequently, federal prosecutors in those districts within the Ninth Circuit were forced to seek other laws to protect and preserve historic and prehistoric sites and artifacts in their district.

Quarrell Case

The ramifications of the Ninth Circuit's Diaz decision were first felt in the Tenth Circuit (*7*) in the case United States *v.* Quarrell (*9*), which arose out of an incident in October 1975 in New Mexico's Gila National Forest. Two forest officers observed three men excavating a Mimbres Indian ruin in the forest. The officers went to the Mimbres ranger station for reinforcements, and a party of seven forest officers and Grant County sheriff's deputies returned to the site on foot. Upon arriving at the ruin, a sher-

iff's deputy observed Charles and Mike Quarrell digging with picks and shovels in deep holes, and Frank Quarrell standing near the holes. The men were placed under arrest; they all admitted excavating the ruin. Artifacts recovered included two metates, two grooved stone axes, other miscellaneous stone tools, three nearly complete Mimbres bowls, and a quantity of assorted sherds. The average of three professional appraisals placed the value of the materials at $2706.

The vandalized site (AR-03-06-05-32) is located on a small hill overlooking the Mimbres River at an elevation of 6375 feet within the pinon-juniper vegetation type. The site originally consisted of about seven to ten rooms, a kiva of the classic period, and probably four pithouses. Tree ring samples suggest a date of about A.D. 1000. The prescence of a kiva in the Membres area is unusual, this being the third one reported. The pottery is typical of the Mimbres classic period including several pieces with fine naturalistic designs (*10*).

Mike and Charles Quarrell were charged with violating the Antiquities Act and the case was tried before United States Magistrate John Darden in Las Cruces, New Mexico, in May 1976. During the trial one of us (D.F.G.) testified that the site excavated by the Quarrells was an authentic prehistoric Mimbres village dating from A.D. 1000 to A.D. 1100. He stated that the artifacts were 800 to 900 years old and in his opinion were objects of antiquity.

At the conclusion of the evidence, the defense counsel argued that the charges should be dismissed because the Antiquities Act was unconstitutionally vague as judged in the Diaz decision. The other author (R.B.C.), citing the Supreme Court cases United States *v.* National Dairy Corporation (*11*) and United States *v.* Raines (*12*), argued that the determination of whether a statute is unconstitutionally vague must be made in light of the facts of the particular case. He stated that the facts of the Quarrell case were solidly within the ambit of the Antiquities Act inasmuch as the 800- or 900-year-od artifacts were unquestionably objects of antiquity. The magistrate agreed with the government, found that the artifacts excavated by the Quarrells were objects of antiquity, and upheld the act. He found the Quarrells guilty of violating the act and sentenced Mike and Charles to perform 40 hours of community service and placed them on supervised probation for 1 year. The defendants did not appeal the conviction.

Camazine Case

The constitutionality of the Antiquities Act was challenged a second time in the Tenth Circuit in United States *v.* Camazine (*13*). Scott Camazine, a 25-year-old Harvard medical student, was arrested on 24 July 1977 by Zuni tribal rangers at the site of a prehistoric ruin on the Zuni Indian reservation in western New Mexico. Camazine admitted digging for artifacts at the site when confronted by the rangers. The pottery sherds unearthed by Camazine were photographed in place and were seized the following day by an FBI agent.

The site, known as T:8 in the files of the Zuni archaeological enterprise, is a small 20- to 30-room pueblo ruin consisting of a subterranean kiva and two separate room blocks that were at least two stories high, with a large peripheral artifact scatter. Both room blocks have dense trash areas to the east. Types of painted pottery include St. Johns polychrome, Reserve-Tularosa black-on-white, and Puerco black-on-white; these suggest that the site dates from A.D. 1100 to A.D. 1200. One of the room blocks has four wings in an elongated "X" shape with the kiva depression in the southeast wing. The site is located on the top of a small hill in Horsehead Canyon at an elevation of 6940 feet. Vegetation includes a pinon-juniper overstory with sage and grass ground cover (*14*).

Camazine was charged with violating the Antiquities Act in a complaint filed on 28 July 1977 in a U.S. magistrate court. Before trial, Camazine's attorney filed a motion to dismiss the complaint, claiming the Antiquities Act was unconstitutionally vague. The government's response pointed out that artifacts and ruins in question were undoubtedly objects of antiquity and concluded: "To strike down the Antiquities Act as being unconstitutional would expose all National Forests and National Parks and their ruins and monuments to wanton and irreversible destruction at the hands of souvenir and commercial pottery hunters."

The Camazine case was tried before U.S. Magistrate David R. Gallagher on 15 August 1977. Magistrate Gallagher declined to rule on the defendant's motion to dismiss until after the United States presented its case. Bruce Anderson, an archaeologist for the National Park Service, and T. J. Ferguson, an archaeologist with the Zuni tribe, testified that the ruin was an Anasazi pueblo inhabited from approximately A.D. 1100 to A.D. 1200 and the ceramic sherds were 700 to 800 years old. At the conclusion of the government's case, Magistrate Gallagher granted Camazine's motion and dismissed the complaint, holding that the Antiquities Act was unconstitutionally vague on its face and fatally vague as applied to the facts of the case. Inasmuch as the magistrate waited until the government put on its case before striking down the statute, the United States was precluded by the double jeopardy clause of the Fifth Amendment to the Constitution from appealing the magistrate's opinion.

Smyer-May Case

Gallagher's decision in the Camazine case left some question in the district of New Mexico, and in the country as a whole, as to the continuing validity of the Antiquities Act. However, the issue was resolved quickly in the case United States *v.* Smyer and May (*15*), which concerned, once again, activities in the Gila National Forest in southwestern New Mexico. In October 1977, forest service officers discovered that a prehistoric Mimbres ruin had been recently excavated. Consequently, they swept the roads leading to the site of all tire tracks so that they would be able to determine if another vehicle entered the road to the ruin. On 29 October two forest service officers observed fresh tire tracks on the road to the ruin. The tracks led directly by a sign warning that it was unlawful to appropriate, excavate, injure, or destroy ruins, monuments, or objects of antiquity in the area. When the two officers reached the site, they found several large freshly dug holes surrounded by fresh backdirt on two ruins approximately 300 yards apart. They also found various excavation tools and, in an arroyo between the two sites, they discovered a pickup truck whose tire treads matched those of the tire tracks on the road leading to the site. In looking for the truck's registration they uncovered a photograph of defendant Byron May standing on the ruin with skulls on each shoulder and a skull on his head and long bones in each hand. The registration revealed that the pickup was owned by Byron May of Deming, New Mexico.

The two sites (AR-03-06-05-250 and -251) are located on an eastern fork of Sapillo Creek just over the divide from the Mimbres River drainage. The sites are on southern exposed slopes at an elevation of 6600 feet with a vegetation cover of pinon-juniper. Site 250, the larger, consists of 20 to 30 rooms, three-fourths of which have been vandalized. More than

800 sherds, all of the Mimbres classic period, were recovered from the vandals' spoil dirt at the site. In addition, chipped stone artifacts were found in abundance along with a few pieces of worked shell. Also present were skeletal remains of more than ten humans, all badly disarticulated by the vandals. Site 251 had four potholes dug into a trash area. The single room at this site was not disturbed.

In an interview with a forest service officer on 30 October, May admitted that he and William Smyer had been digging at the ruin for several weeks for Indian artifacts, and that he had sold two bowls recovered from the ruin for $4000. He offered to return the artifacts taken from the site and took the officer to Smyer's house, where May selected six Mimbres black-on-white bowls, a bone awl, and a clay effigy from a collection of 30 to 40 bowls and turned them over to the officer. Several days later Smyer was interviewed and confirmed May's statement. On 7 November two forest service officers and two archaeologists returned to Smyer's home with a search warrant and seized 31 Mimbres bowls, each missing one or more pieces. Several days before, Forest Service archaeologists and volunteers from the Mimbres Foundation and under the direction of D.F.G., had screened the fresh backdirt at the site searching for pottery sherds. D.F.G. compared the bowls taken from Smyer's house with the sherds found at the ruin and concluded that one of the sherds fit a Mimbres black-on-white bowl seized from Smyer.

The U.S. attorney's office charged Smyer and May with two counts of excavating the two prehistoric Mimbres ruins and nine counts of appropriating objects from the ruins in violation of the Antiquities Act. In light of the split among the district's magistrates as to the constitutionality of the Antiquities Act, the U.S. attorney chose to bypass magistrate's court and brought the case directly to the United States district court for resolution of the question.

As in the Camazine case, counsel for Smyer and May filed a motion to dismiss the complaint before trial, asserting that the Antiquities Act was unconstitutionally vague. R.B.C. responded that the Ninth Circuit in the Diaz case "rallied too quickly to a spontaneous constitutional attack on the statute forgetting its duty to seek a limiting construction that might save the Act" (*16*). He argued that in deciding whether a statute is unconstitutionally vague, the determination must be made in view of the facts of a particular case:

> In the case before the Court, the two ruins excavated by the defendants were prehistoric Mimbres ruins of the Classic period, which were inhabited by Indians of the Mimbres branch of the Mogollon civilization from approximately the year 1000 A.D. to the year 1200 A.D. The objects appropriated from the Mimbres ruin were not a couple of ceremonial masks carved three or four years ago, but were seven classic Mimbres black-on-white bowls, a clay effigy, and a bone awl, all of which are approximately 800 to 900 years old. Thus, the facts of the instant case fall squarely within the ambit of the Antiquities Act. Clearly, 800- to 900-year-old Mimbres black-on-white bowls are "objects of antiquity" and the 900-year-old Mimbres ruins excavated by the defendants are "historic ruin[s]" within the meaning of the Act.
>
> Moreover, the defendants here are not unwary tourists who stumbled upon ceremonial war masks, but are experienced commercial pottery hunters. The evidence will show that the defendants used shovels, picks, and screens to excavate the ruin in search for Mimbres pottery. The remains of their excavation demonstrated the defendants' expertise. The defendants knew the bowls would be found in the corners of the prehistoric walls and in the graves of the former inhabitants and concentrated their excavation there. The defendant Byron May, told a Forest Service officer that he had sold two of the bowls from the site for $4000, and a collection of approximately twenty Mimbres Black-on-White bowls was seized from the defendant William Smyer's home.

The government's response concluded with a quote from J. J. Brody, the director of the Maxwell Museum of Anthropology at the University of New Mexico and author of a recent book, *Mimbres Painted Pottery* (*17*): "The Mimbres people are gone. Where they came from, where they went, and why such simple villagers became such sophisticated artists is unclear. Much that we could have learned from their village sites has been lost to us—torn up, bulldozed, smashed and looted—by those whose only concern is to steal the pots and sell them to collectors who ask no questions. This rape of New Mexico goes on daily, nightly, as crews of thieves armed with bulldozers and shovels, descend with systematic and silent expertise on likely sites. Not only the pots disappear in these swift raids. Great chunks of knowledge have also disappeared forever" (*18*).

Evidence at the motion hearing established the authenticity and age of the Mimbres ruins and artifacts.

Upholding the constitutionality of the Antiquities Act in its opinion on the nation, the court focused on the fact that the ruins and objects excavated by Smyer and May were 800 to 900 years old. Judge Howard Bratton wrote: "The words 'ruin' and 'monument' plainly require no guessing at their meaning, and the term 'objects of antiquity' is no less comprehensible. Webster's Third New International Dictionary defines 'antiquity' as 'ancient times; times long since past,' so an object of antiquity is an object of or from ancient times or times long since past." Judge Bratton rejected the premise that the language of the Antiquities Act must be mathematically certain. He wrote: "While it may not be possible to state in the abstract a precise number of years that must pass before something becomes an 'object of antiquity,' such exactitude is not required . . . The Antiquities Act must necessarily use words 'marked by flexibility and reasonable breadth, rather than meticulous specificity' (*19*), in order to accomplish its purposes."

Judge Bratton, holding that the Antiquities Act was not unconstitutionally vague, continued: "It is clear that the acts alleged . . . fall squarely within the proscription of the Antiquities Act. In light of what the evidence . . . indicated was the defendants' experience with Indian artifacts and the age of the artifacts . . ., the argument that the defendants could not reasonably have had notice from the language of the Antiquities Act that their alleged activities violated the statute is simply not credible. When measured by common understanding and practice, it is evident that the language of the Act is not indefinite, vague or uncertain."

The case was tried before Judge Bratton in January 1978 in Las Cruces, New Mexico. At the conclusion of the evidence and argument of counsel, Judge Bratton found Smyer and May guilty. They were sentenced to imprisonment for 90 days on each of the eleven counts charged, the periods of confinement to run concurrently. The case is presently being appealed (*20*).

Need for New Statute

Despite the success of the Smyer-May case in upholding the constitutionality of the Antiquities Act, there is real need for a new statute. The penalties provided in the 1906 act are inadequate to deter the looting of prehistoric ruins and commercial dealings in stolen prehistoric artifacts. In 1906, Congress could not have anticipated the lucrative market in prehistoric artifacts that exists today. In light of the commercial values attached to artifacts, especially pottery, a fine of $500 for a violation of the act is in effect a business expense. The nine artifacts in the Smyer-May case were appraised at $3975 and those in the Quarrells case, at $2706. The drafters of the Antiquities

Act could not have imagined that Byron May would sell two Mimbres bowls for $4000, or that the Forest Service would return a collection of thirty Mimbres bowls worth approximately $30,000 to William Smyer because they could not prove they were taken from the national forest.

Other federal statutes impose stiffer penalties for comparable activities. For example, the theft of U.S. government property exceeding $100 in value, or receipt or concealment of such property if stolen, or destruction or depredation of property of this value is punishable by a fine of $10,000 or imprisonment for a term of 10 years, or both.

Furthermore, the Antiquities Act imposes no penalties for those who deal in artifacts stolen from federal land. It prohibits only the appropriation of objects of antiquity; hence, those who sell or purchase prehistoric artifacts taken from national forests or parks do so with impunity. The breadth of the acts's prohibitions should be expanded so as to stop, in some measure, the lucrative commercial dealings in illegally obtained artifacts.

In addition, although the meaning of the terms "object of antiquity" and "historic or prehistoric ruin or monument" poses no problem in the Tenth Circut, the vagueness question is still an issue in the Ninth Circuit and in other courts that have not addressed the issue.

Proposed New Statute

With the above considerations in mind we have drafted a bill to amend the present Antiquities Act (*21*). The draft statute strengthens the old one in three respects: (i) the nature of the actions made unlawful is clearly specified; (ii) dealing in artifacts stolen from federal land is brought under the bill; and (iii) violation of the act is made a felony, with maximum penalties for repeat violators of 5 years in prison, $10,000 in fines, or both.

The new act resolves the problem of ambiguity by defining the sites at which excavation is barred and the objects of antiquity whose removal is unlawful (*22*). Definitions of the terms prehistoric site, historic site, paleontological site, prehistoric specimen, historic specimen, and paleontological specimen are an integral part of the statute (*23*).

The actions barred under the bill are covered in two clauses. One overlaps the present act with the words "excavate, injure, disturb, destroy, appropriate, remove, or commit any depravation." The second clause bars dealing in antiquities with the words "wilfully possess, sell, purchase, barter, offer to sell, purchase, or barter, traffic in, or transport." Maximum penalties are the same for each clause.

The bill, by making violation of its provisions a felony (*24*) and increasing the maximum penalties, reflects the economic realities of the 1970's market in antiquities and the importance with which the nation views their preservation. It is hoped that the bill, if enacted into law, will deter rather than annoy the predators of the nation's cultural heritage.

References and Notes

1. "An Act for Preservation of American Antiquities." 34 Statutes at Large 225 (1906).
2. F. Turner, *The Frontier in American History* (Holt, New York, 1920).
3. 16 U.S. Code 433 provides: "Any person who shall appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall, upon conviction, be fined in a sum not more than $500 or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the Court."
4. Senate report No. 3797, 59th Congress, 1st session (1906).
5. 40 *Congress. Rec.* 7888 (5 June 1906).
6. 368 Fed. Supp. 856 (District of Arizona, 1973).
7. Arizona is within the Ninth Circuit, which also includes California, Nevada, Idaho, Oregon, Washington, and Montana. The Tenth Circuit includes New Mexico, Colorado, Utah, Oklahoma, Kansas, and Wyoming.
8. 499 Fed. Rep., 2nd ser. 113 (9th Cir., 1974).
9. Criminal information No. 76-4, filed 13 January 1976, U.S. District Court, Albuquerque, New Mexico.
10. S. LeBlanc and R. Anyon, "A preliminary report on excavations at the Bradsby site Y:4:35" (manuscript on file, U.S. Department of Agriculture Forest Service, Albuquerque, New Mexico 87102).
11. 372 U.S. Supreme Ct. Rep. 29 (1962).
12. 362 *ibid.* 17 (1960).
13. Magistrate No. 77, docket case No. 1416-M filed 28 July 1977.
14. T. Ferguson, "The cultural and scientific significance of Z.A.E. T:8, a small pueblo in Horsehead Canyon, Zuni Indian Reservation, New Mexico" (manuscript on file with the Zuni Archaeological Enterprise, Zuni, New Mexico 87327).
15. Criminal complaint No. 77-284, filed 15 November 1977, U.S. District Court, Albuquerque, New Mexico 87103.
16. U.S. Civil Service Commission *v.* National Association of Letter Carriers, 413 U.S. Supreme Ct. Rep. 548, 571 (1973).
17. J. J. Brody, *Mimbres Painted Pottery* (Univ. of New Mexico Press, Albuquerque, 1977).
18. ———, *N. Mex. Mag.* (October 1977), p. 25.
19. Grayned *v.* City of Rockford, 408 U.S. Supreme Ct. Rep. 104 (1971), p. 110.
20. The question of the constitutionality of the Antiquities Act has been answered in the district of New Mexico by Judge Bratton's opinion in the Smyer-May case. The prospect for affirmance of Smyer and May's convictions by the Tenth Circuit Court of Appeals appears good in light of the circumstances of the case and Judge Bratton's sound opinion. It is unlikely the Tenth Circuit will choose to follow the Ninth Circuit's reasoning in the Diaz case, but that determination must await briefing and arguments by counsel before the court of appeals.
21. Copies of the draft bill are available from R.B.C. on request.
22. The casual tourist who picks up a pottery sherd or arrowhead in a National Forest or Park will not be prosecuted under the act. The departments of Agriculture and Interior both have regulations that proscribe such conduct, which can be treated as a misdemeanor and handled by a federal magistrate. 36 Code of Federal Regulations 261.9, 2.20.
23. Definitions in the bill are as follows:
    (c) The term "prehistoric site" means any locality in which human behavior has been of sufficient duration or complexity to result in the deposition of a number of prehistoric specimens or the building of structures prior to the advent of written history in that geographical locale.
    (d) The term "historic site" means any locality in which human behavior has been of sufficient duration or complexity to result in the deposition of a number of historic specimens or the building of structures since the advent of written history in that geographical locale.
    (e) The term "paleontological site" means any locus of fossil preservation.
    (f) The term "prehistoric specimen" means any item which has been made or modified by human action prior to the advent of written history in a geographical locality. As used in this Act the term includes but is not limited to petroglyphs, pictographs, paintings, pottery, tools, ornaments, jewelry, coins, fabric, ceremonial objects, vessels, ships, armaments, vehicles, and human skeletal remains.
    (g) The term "historic specimen" means any item which has been made or modified by human action since the advent of written history in a geographical locality and is at least 50 years of age. As used in this Act the term includes but is not limited to paintings, pottery, tools, ornaments, jewelry, coins, fabric, ceremonial objects, vessels, ships, armaments, and vehicles.
    (h) The term "paleontological specimen" means any evidence of fossil remains of multicellular invertebrate and vertebrate animals and multicellular plants including imprints thereof. Organic remains primarily collected for use as fuels such as coal and oil excluded.
24. The word "willfully" has been added to the language of the 1906 act because a violation of the section is now a felony. However, as Judge Learned Hand stated in American Surety Company *v.* Sullivan, 7 Fed. Rep., 2d ser. 605 (2nd Cir., 1925), the word "willful" in a criminal statute means only that the person acted on his own volition and was aware of the acts he was committing. It does not mean that the actor knows he is breaking the law. Furthermore, although willfullness is an element of the offense under the proposed amendment, the United States need not prove the accused knew the archaeological, historical, or paleontological site or specimen was located on United States government property. The requirement that the site or specimen was situated on United States government property furnishes the jurisdictional basis for the federal offense. Knowledge of such jurisdictional facts is not generally an element of the required intent under federal statutes. United States *v.* Feola, 420 U.S. Supreme Ct. Rep. 671 (1975).
25. All opinions in this article are those of the writers and not necessarily those of the Department of Justice nor the U.S. Department of Agriculture Forest Service.