

Valley of the Drums and Other Hazardous Wastelands

Residents around Stump Gap Creek, Ky., became concerned last December as smelly and damaged 55-gallon drums leaking unknown chemicals came floating down the Ohio River flood plain. Although no one knew it then, these were just the first signs of a hazardous-waste nightmare, many details of which remain unknown. About all that's known for certain is that four separate sites and 23,000 to 100,000 drums are involved.

Leaking drums fished from the Ohio River and embedded in ice along its banks appear to have been lifted by flood waters from the field of a farm affectionately known to state officials as Bennie's Last Chance (for an adjacent liquor store). Some 832 drums were found in the river or on the farm. Army mine-sweeper readings of the site appear to indicate the presence of four major burial pits containing an unknown quantity of additional drums, according to Gene Mooney, secretary of Kentucky's Department of Natural Resources and Environmental Protection.

Drums exhumed in the spring of 1977 on that site by the FBI in conjunction with an action they were bringing against a Donald Distler, contained the same types of chemicals that Environmental Protection Agency tests have just identified in the surface drums, Mooney told SCIENCE NEWS. Distler was convicted in December of dumping chemical wastes into the Louisville sewer system in 1977.

About two miles north, across the Jefferson County line, is the Dixie Highway site where mine-sweeping crews detected 53 echoes from buried metal in a field. "We believe that those are 53 drums, but we don't know," Mooney said, and won't know until the ground thaws and excavations can be made. Another 2,000 drums are stashed on the surface of an abandoned brickyard, now owned by Distler, which is located on the outskirts of the little town of West Point. And the fourth site — most awesome of all — is called Valley of the Drums. Working from high-resolution aerial photos of the site, EPA officials now estimate that 20,000 to 100,000 additional drums are stored on its surface.

"We're certain" the groundwater has been contaminated, says John White, administrator of EPA's Region IV office in Atlanta, but "we don't know the extent of it or how far it's moved." He says all buried drums have probably deteriorated to the point that their contents will have to be pumped from the soil. EPA is planning to drill bore holes into the soil to measure groundwater contamination once the

ground thaws. Many surface drums have also deteriorated badly.

Samples of the 832 barrels EPA has re-packaged showed that all but four contained paint solvents and the types of metals commonly used in paint pigments. The other four are "too hot" to transport commercially to EPA's labs and must await analysis until someone can drive samples there personally. What the other thousands of drums contain is also a mystery. Valley of the Drums is a five-acre site owned by the widow of a trucker who had a reputation for dumping chemicals into a sump and then reusing drums, so no drum markings can be trusted.

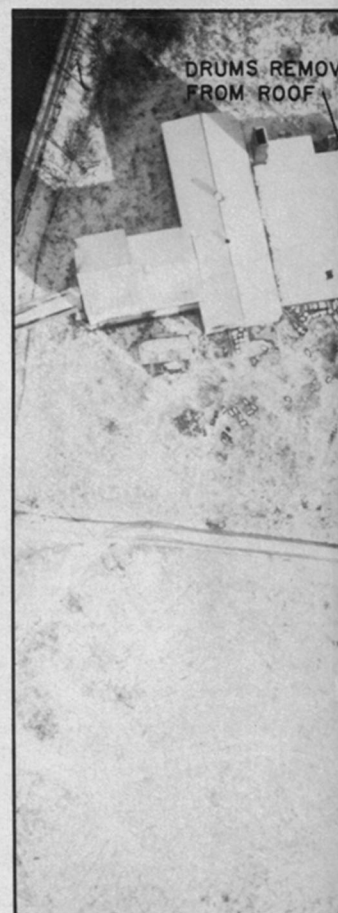
As a result, health risks posed by the leaking drums are unknown. Other unanswered questions are who stored the drums, who generated the wastes, how each site can be cleansed and who will pay for the ultimate identification and disposal of the wastes.

Cost is a very important element. So far EPA has been actively involved in only the Bennie's Last Chance site cleanup. Its Region IV office totally drained its emergency contingency fund of \$100,000 to pay for rounding up the scattered drums and transferring their contents into new ones. The state must now pick up responsibility and the tab for transporting and disposing of those wastes, something estimated to cost \$20,000. Kentucky has received \$40,000 from the federal Disaster Assistance Administration, but that's expected to go quickly. And EPA's White doubts Congress will want to step in if the costs prove high for fear of setting a precedent; only last December EPA estimated the presence of more than 32,000 dangerous chemical dumps.

One might hope to collect damages and cleanup costs from those who stored the wastes, but no one has violated any statutes. Although EPA has proposed severe fines and punishment for what it will define as illegal dumping of hazardous wastes, its laws have not gone into effect, nor will they be retroactive, White says. Kentucky, planning similar regulations, is awaiting EPA's so that it can pattern its off of those. The state has been able to get a court order demanding that Distler dispose of the 2,000 drums at his brickyard site in a safe manner; Mrs. Taylor, owner of the Valley of the Drums got a similar order. But who will pay for groundwater cleanup or assessments, or the removal of wastes from the sites on state property is an important issue this case will force all states to grapple with. □



Aerial photo of a portion of the estimated 20,000 to 100,000 barrels at the Valley of the Drums in Shepardsville, Ky. (above). Each pinhead-size white dot represents a 55-gallon drum containing hazardous chemical wastes. Some 2,000 drums were located on Distler's brickyard site (below) in West Point, Ky., using EPA's Enviro-Pod, a panoramic, two-camera aerial-reconnaissance system that provides resolution on the scale of inches.



Microsurgery for strokes and visual disorders

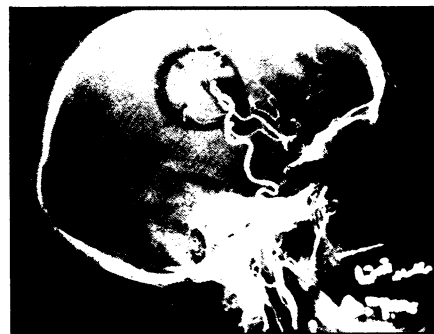
A new microsurgical technique, which is being performed with increasing frequency on persons who aren't getting enough blood to their brains, can not only prevent strokes but can also counter visual disorders that result from such blood obstruction. So report neurosurgeon Duke S. Samson and his colleagues at the University of Texas Health Sciences Center in the Jan. 26 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* and ophthalmologist Thomas P. Kearns and his co-workers at the Mayo Clinic in the January *MAYO CLINIC PROCEEDINGS*.

One of the greatest advances in stroke research during the past several decades is the realization that transient blood obstruction to the brain occurs in many persons before they suffer stroke (death of brain neurons due to blood insufficiency, which may lead to paralysis of various parts of the body and to death). What's more, these cutoffs of blood to the brain are known to occur often in the internal carotid arteries — two major arteries supplying the head and brain with blood — because they are obstructed by a blood clot. Not surprisingly, surgeons would like to remove a clot from an internal carotid artery before a stroke actually takes place. But such a clot isn't always accessible for removal by conventional vascular surgery techniques, because it may extend too far up in the head.

So in 1967, surgeons at the Medical College of Vermont pioneered a new technique to overcome blood insufficiency to the brain resulting from an obstructed internal carotid artery. The procedure was arterial bypass, along the lines of that used on patients with heart disease. It consisted, essentially, of a surgeon drilling a hole in a patient's skull and, under a microscope, hooking up the superficial temporal artery (a branch of the external carotid artery) to the middle cerebral artery (a small artery in the brain), thus bypassing the obstructed internal carotid. The logic underlying this tack is easy to grasp if one realizes that a carotid artery goes up the neck, then branches into an internal carotid artery (which goes into the head) and into an external carotid artery (which goes into the scalp). So this technique simply forced the external carotid branch to "pinch hit" for the internal branch in getting blood from the neck into the head.

From 1967 to the middle of the 1970s, this microsurgical bypass procedure was tried on a number of patients by various surgeons. And while it seemed to improve the blood flow to their brains, no clinical trial was carried out to confirm that this was really the case, much less to see whether it could also prevent strokes. Samson and his colleagues have now conducted such a test.

Sixty patients with inadequate blood



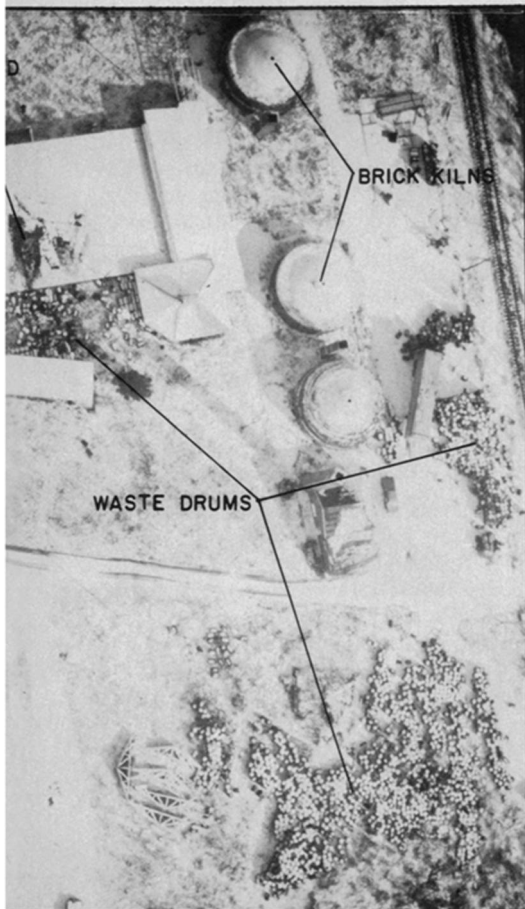
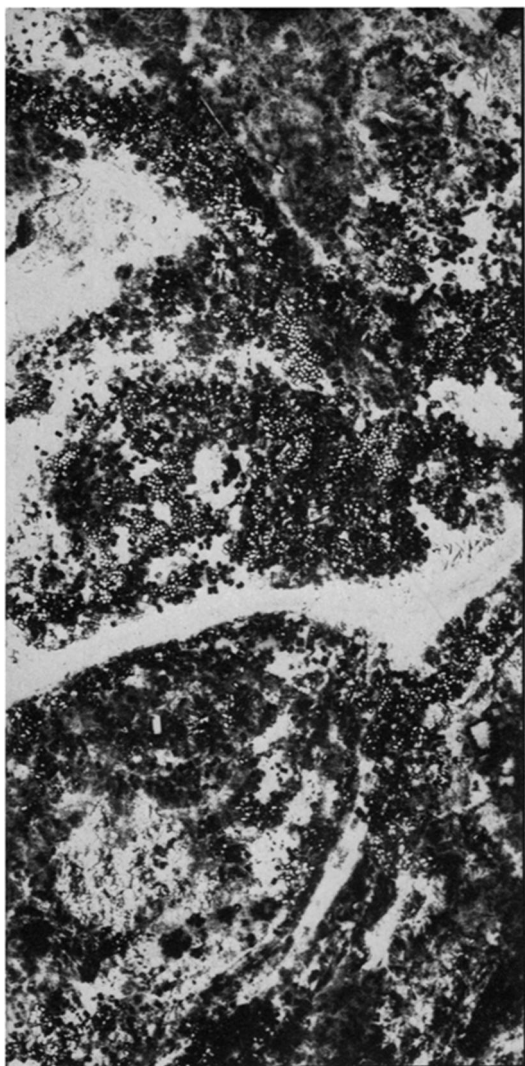
This patient's brain has successfully undergone the carotid bypass operation.

flow to their brains due to an obstructed internal carotid artery were offered the arterial bypass procedure. Fifty agreed to it; 10 declined. All 50 patients were followed up after the surgery for at least 14 months, since various studies have shown that the greatest risk for stroke in such patients occurs within one year after the first attack of blood insufficiency.

As Samson and his co-workers report, there were no operative deaths, and major complications from the procedure were experienced by less than eight percent of the patients. Seventy-six percent of the patients no longer suffered blood deprivation to the brain after the operation, and 94 percent of them escaped strokes. As for the 10 patients who elected not to undergo microsurgery and to take medication for their condition instead, two had strokes, and four others continued to suffer blood insufficiency to the brain. Both results suggest that the arterial bypass can help reduce blood inadequacy to the brain in such patients and help protect them from strokes. The real proof that this is the case, however, will only come with a much larger, more scientifically designed clinical trial. Such an investigation began at a number of medical centers during late 1977 and will terminate in 1982.

Two other indications in favor of the carotid artery bypass in addition to stroke prevention, Kearns and his co-workers report, are two eye disorders that can result from carotid artery blockage. One is venous stasis retinopathy, which consists of loss of vision because not enough blood can get through the carotid artery to supply the retina of the eye. The other is orbital pain, which results from not enough blood getting through the carotid artery to supply the orbit of the eye.

Kearns and his colleagues recommend the bypass for venous stasis retinopathy on the basis of 13 patients whose venous stasis retinopathy appears to have decreased following a bypass. They urge the bypass for orbital pain on the basis of only one patient who had a bypass exclusively for orbital pain. However, the procedure dramatically relieved that patient of distress. □



Photos: EPA

Kearns et al./Mayo Clinic Proc.