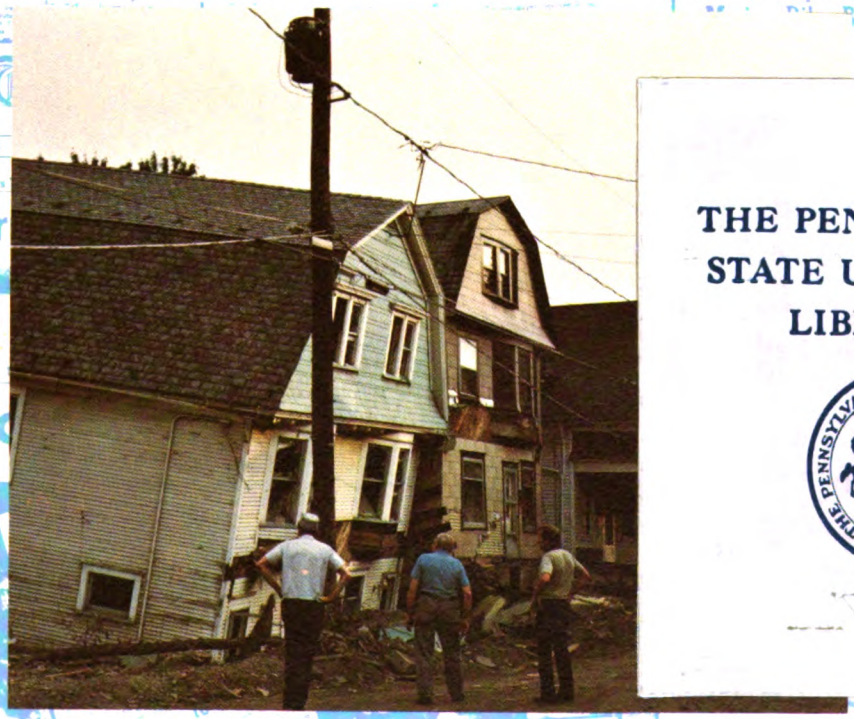
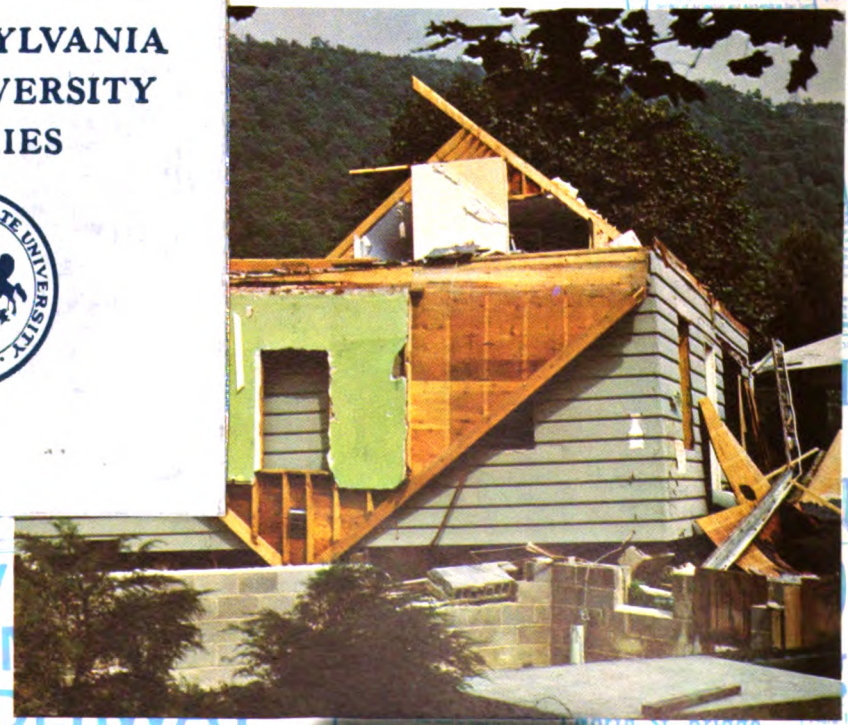
TROPICAL STORM

1972





It is impossible to name the tens of thousands of people who should be recognized for the heroic parts they played in the tragedy of Agnes. Officials and their staffs performed duties far beyond their assignments. Trained and untrained volunteers acted with selflessness and a kind of bravery they did not know they possessed. An unknown number of acts of valor can never be chronicled because they were performed unseen and in many tragic cases the principals perished. To identify a few individuals would be to neglect equally gallant but nameless heroes. In fairness to those whose deeds remain unrecorded, we have used no names at all.

Within this limited space it is possible to relate only a small number of occurrences, many of which took place almost simultaneously; a full account would fill volumes. We hope the reader will gain some understanding of how Agnes and her floods affected people's lives and, most of all, how people helped people.

The Birth of Agnes

Tourists who were taking pictures of the Mayan pyramids and temples at Chichen Itza in Yucatan held their light meters high in the pouring rain. After all, they had come a long way to see these treasures of a civilization that had disappeared long ago when the conquistadors conquered Mexico. Others took a quick look and returned to the Mayaland Hotel where they drank Mexican beer until the cars could take them on the long wet drive back to the ship which was scheduled to sail from Progreso that evening of June 14, 1972.

The following day, reports of a weather disturbance over Yucatan seemed to be sufficiently suspicious to the National Hurricane Center in Miami, Fla., to warrant dispatching a plane to look it over. The disturbance increased in intensity and Hurricane Hunters were directed to keep a plane in the rainstorm at all times until further notice. The planes, with their intricate electronic equipment, kept the Hurricane Center informed of the conditions and changes of the tropical depression that seemed to be building up.

June 16 was another of those depressing rainy days in Sunbury, Pa. The woman in the white house rocked and complained to her neighbor, as usual, about the Government.

"We used to be able to sit out on the porch and watch our beautiful Susquehanna River. And then those Government people came along and cut off our view with that big pile of dirt and, as if that wasn't bad enough, they put that big concrete wall on top of all that. Can't see a thing any more. When I wrote to Harrisburg about it they told me to tell the Army Engineers. Now if they don't come along and take it down, I'll go to the President himself. 'Flood control' they call it! Why, the biggest flood we've ever had here was almost a quarter of a century ago and even then the water never came anywhere near this house!"

At about the same time, the husband of a reporter in Wellsville, N.Y., grumbled to his wife. "Now here's an absurd editorial in your paper. It tells about hurricane preparations. Everybody knows things like that don't happen here."

"Tell you what," a young Government economist said to his wife. "Next Wednesday I'll take you out to Olney. We'll have dinner at

the Inn, see the play at the Olney Theatre, and get back home to Washington in plenty of time to get the baby-sitter back by midnight."

The next morning he picked up two tickets for Wednesday, June 21. It would be a great night. It's not good to stay home all the time.

The Friday lunch was getting to be almost a tradition with the planners who worked at the Baltimore District Office, U.S. Army Corps of Engineers. This Friday the conversation, as it frequently did, turned to how much is enough flood control. The men, both military and civilians, handled, among other things, the flood control programs for the watershed area which includes most of Pennsylvania, part of New York, Maryland, the District of Columbia, and parts of Virginia drained by the Potomac River.

In 1946 a great flood poured into Elmira, N.Y., and caused such extreme damage that it was designated as a 100-year flood, which is to say that a flood of that magnitude would "probably" occur about once in a hundred years. Slightly smaller floods can be pretty well contained because of a system of dikes and reservoirs completed in 1956. But the "probably" could be a treacherous word.

A flood greater than a 100-year flood had better not come along until they finished several mammoth projects. One, for example, was just over the Pennsylvania line near Elmira, N.Y., and it would cost about $135,000,000. It takes a long time and a lot of money to build these things but it's well worth it if it's needed. The engineers dreaded what could happen before they completed their nearly endless work.

Years ago floods were bad enough, but now there are so many people in the cities and along the shorelines that any flood out of control could easily be a catastrophe.

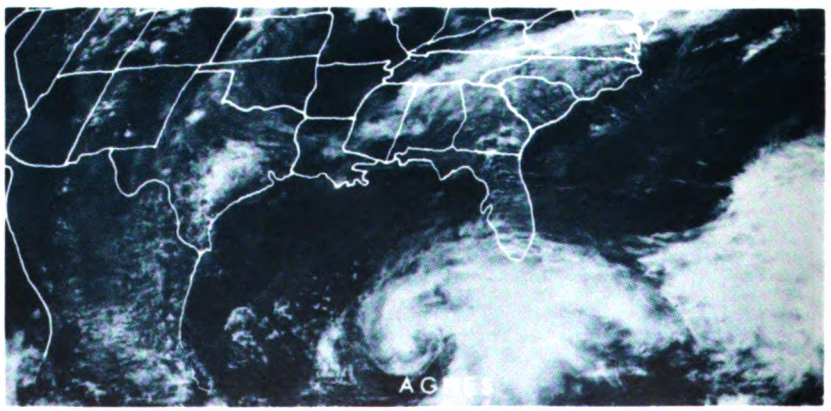
On June 16, the meteorologists at the National Hurricane Center were getting much more worried about the disturbance that started in Yucatan. It was moving east and gathering momentum. On the 17th it veered north and headed up through the Yucatan Channel which separates the mainland from Cuba. Several tornado-like waterspouts formed, combined, and began to make a single gigantic storm which revolved counterclockwise and moved menacingly northward in the direction of Florida's panhandle.

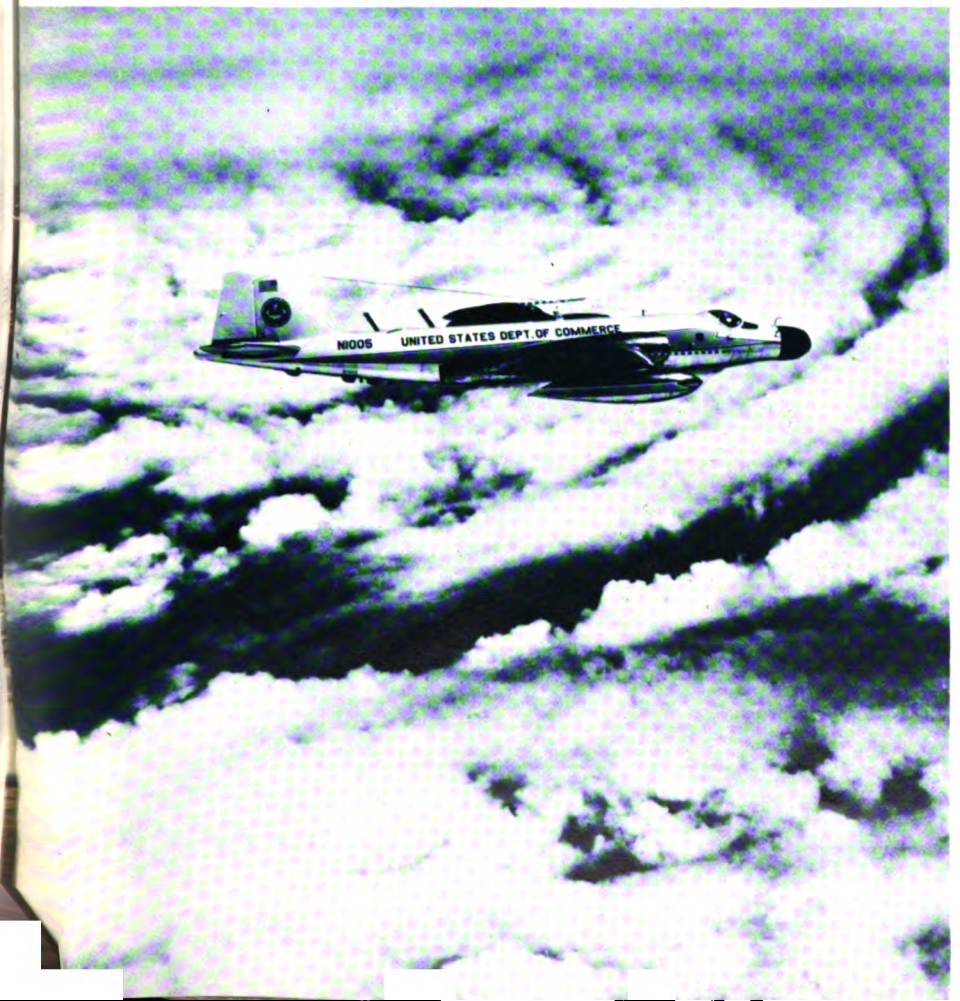
When the storm had accelerated to windspeeds of more than 40 miles an hour, the National Weather Service changed its designation from a disturbance to a depression and then to a tropical storm – all within a 12-hour period.

They named her Agnes.

Agnes continued to grow and early in the morning of Sunday, June 18, she had whipped herself into a frenzy with spiraling winds of more than 74 miles an hour. She was now 1972's first

17 June 1972





hurricane and showed her true disposition by whelping at least a dozen tornados which hit the lower keys and central Florida. Six people were killed.

Agnes continued to move northward at about 15 miles an hour with a circular windspeed that gusted to almost 100 miles an hour. She announced her coming with unusually heavy rains that preceded her by about 300 miles. She now covered more than half of the Gulf of Mexico.

The National Weather Service issued hurricane warnings for the Florida coast about 60 miles east and west of her probable target, the city of Apalachicola.

Hurricane Hunters were still flying through the storm — the most dangerous and frightening kind of flying man has ever attempted. They took readings and transmitted them to Miami. The planes were tossed about like confetti and they would continually enter the "eye," or center, of the storm and report the conditions there.

The first high winds and torrential rains slammed against the Florida coast on June 18 and Agnes devastated it as best she could. The center arrived about noon on the following day. Fortunately the warnings that preceded her had been heeded, so the damage was less than it might have been, although anyone who had been through it might not believe it could be worse.

The Corps of Engineers is responsible for, among other things, maintaining certain bridges, the Intracoastal Waterway, and the reservoirs, dams, and other water management devices that Agnes would strike at before she departed. The Engineers at Mobile, Ala., and Jacksonville, Fla., were prepared for immediate trouble. Ten other Division and District Engineer Offices along the coast from Florida to Massachusetts and inland as far as Ohio and West Virginia were also ready for whatever might come.

The American Red Cross, which is used to dealing with disasters and the aftermaths, was also getting ready. So, too, were the Salvation Army, Civil Defense, and all the other organizations that are on hand when they are needed.

The U.S. Coast Guard was doing its job as Agnes rolled across the Gulf of Mexico. It located an abandoned sailing vessel adrift in the gulf and towed it to safety. It rescued a British ship, severely damaged, from the gulf. A damaged Norwegian ship was repaired by the Coast Guard at sea and sent along its way.

On the east coast of Florida, off Cape Canaveral, a 210-foot Coast Guard cutter was torn loose from its moorings and another 82-foot patrol boat was damaged by flying debris. During all this time the Coast Guard continued its search and rescue missions for thousands of small boats along the gulf and Atlantic coasts.

For some obscure reason tropical storms are named for ladies. Agnes was no lady. She would eventually earn the nasty distinction of becoming one of the most devastating storms ever recorded in the United States.

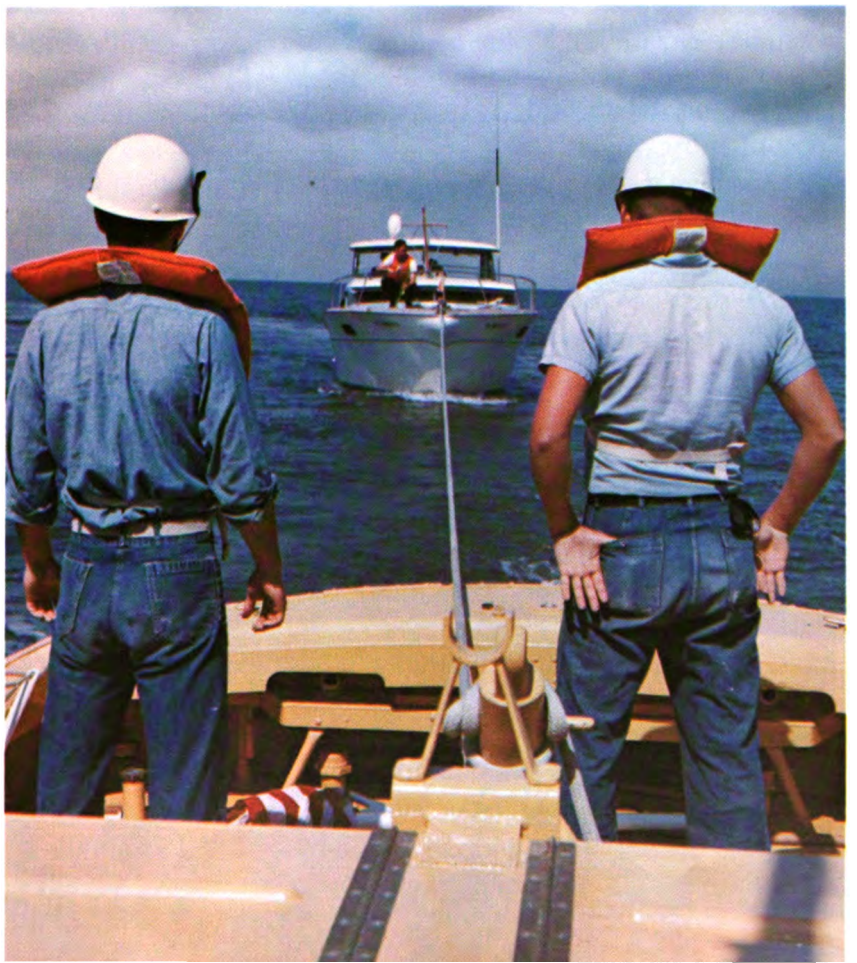
Perhaps the most frightening thing about hurricanes is the feeling a person gets of absolute helplessness. Winds can reach

speeds of up to 200 miles an hour. At the center of the storm is a ghostly area called the "eye" where the winds are quiet and sometimes even blue sky can be seen. The eye may be almost indiscernible or it may be 20 miles wide. Sometimes it will have more than one eye. Around the eye the malicious winds try to destroy everything in the path of the storm. As people who have been in the eye of a hurricane know, the winds suddenly cease, the air seems dead, and there is an eerie sullen quiet for a short time. As the eye passes along on the hurricane's course the winds crash in again from the opposite direction and the storm continues its deadly progress.

The outer extremities of a hurricane can vary from 60 to 1,000 miles in diameter. The center may move forward as much as 40 miles a day or it may remain fixed in one place for hours. Hurricanes born where Agnes was usually head for the northeast to disperse someplace in the North Atlantic Ocean. But not Agnes.

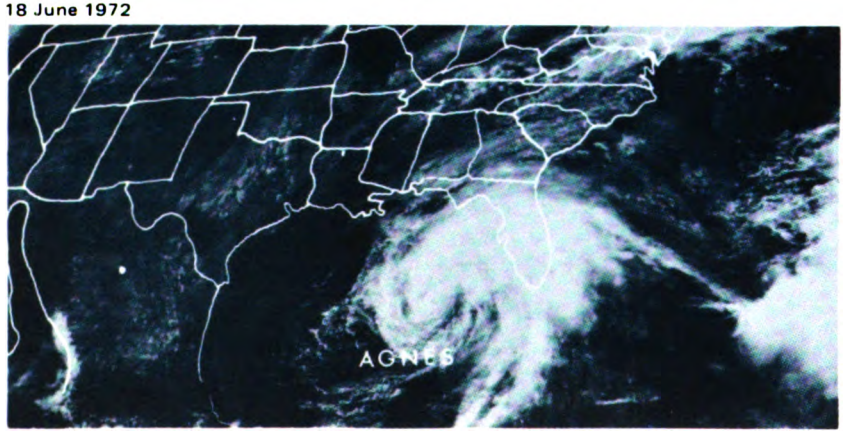
Hurricanes and tropical storms are unpredictable. Some are accompanied by high, towering clouds that reach 60,000 feet above the surface; others may be much smaller.

A tropical storm is capricious, its rains are torrential, and its destructive power is overwhelming. Agnes was no exception.



AGNES COMES ASHORE

18 June 1972



When Agnes hit the Florida coast, she first battered two barrier islands, St. George and St. Vincent, just south of the city of Apalachicola. Not much serious damage was done, as hurricanes go. Her eight-foot waves and 50-mile winds, which frequently gusted to nearly a hundred miles an hour, damaged beach houses on the islands and tore up some others at Alligator Point, east of Apalachicola. She wrecked as many small boats as she could and devoured several fishing shacks that were built out over the water.

U.S. Highway 98, which skirts the Gulf of Mexico along the Florida coast, was washed out in many places but the people who lived in the area respect hurricanes so they heeded the warnings and most of them fled to higher ground.

Before and during her stay in Florida she scattered 18 tornados over the state. Nine lives were lost. She tore up 25 counties and left her bill for about $35 million, $125,000 of which was for the damage she did to bridges, roads, and utilities in and around her port of entry.

Agnes seemed to be getting tired. As she approached the Georgia line, the National Weather Service downgraded her to a tropical storm.

The sustained heavy rains meant heavy flooding, but people breathed a little more easily because they knew it wouldn't last much longer. About 6:00 P.M. the hurricane warnings came down and the National Weather Service again labeled her as a tropical storm rather than a hurricane. In spite of this the rains continued unabated and extended farther and farther to the north.

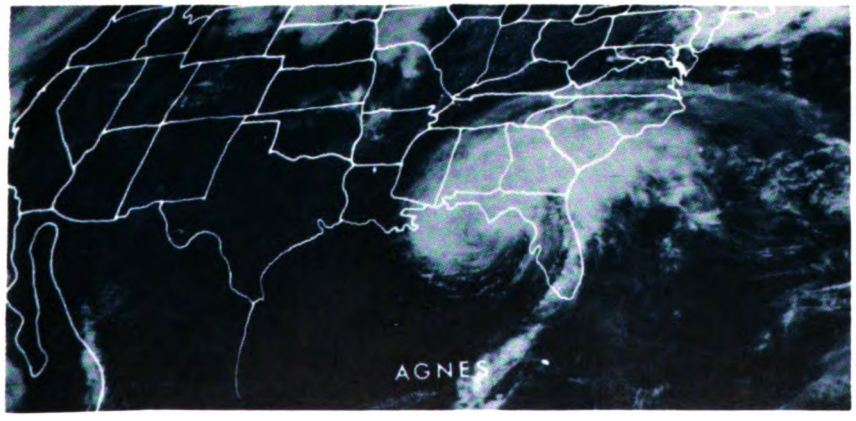
Agnes continued to follow a traditional pattern of tropical storms and ambled along northward on her destructive way to the middle of Georgia. The rains extended from the Appalachian Mountains on the west to well out to sea on the east. Very heavy rains continued to fall over the east coast, reaching by now as far north as North Carolina. Showers started to fall in Virginia.

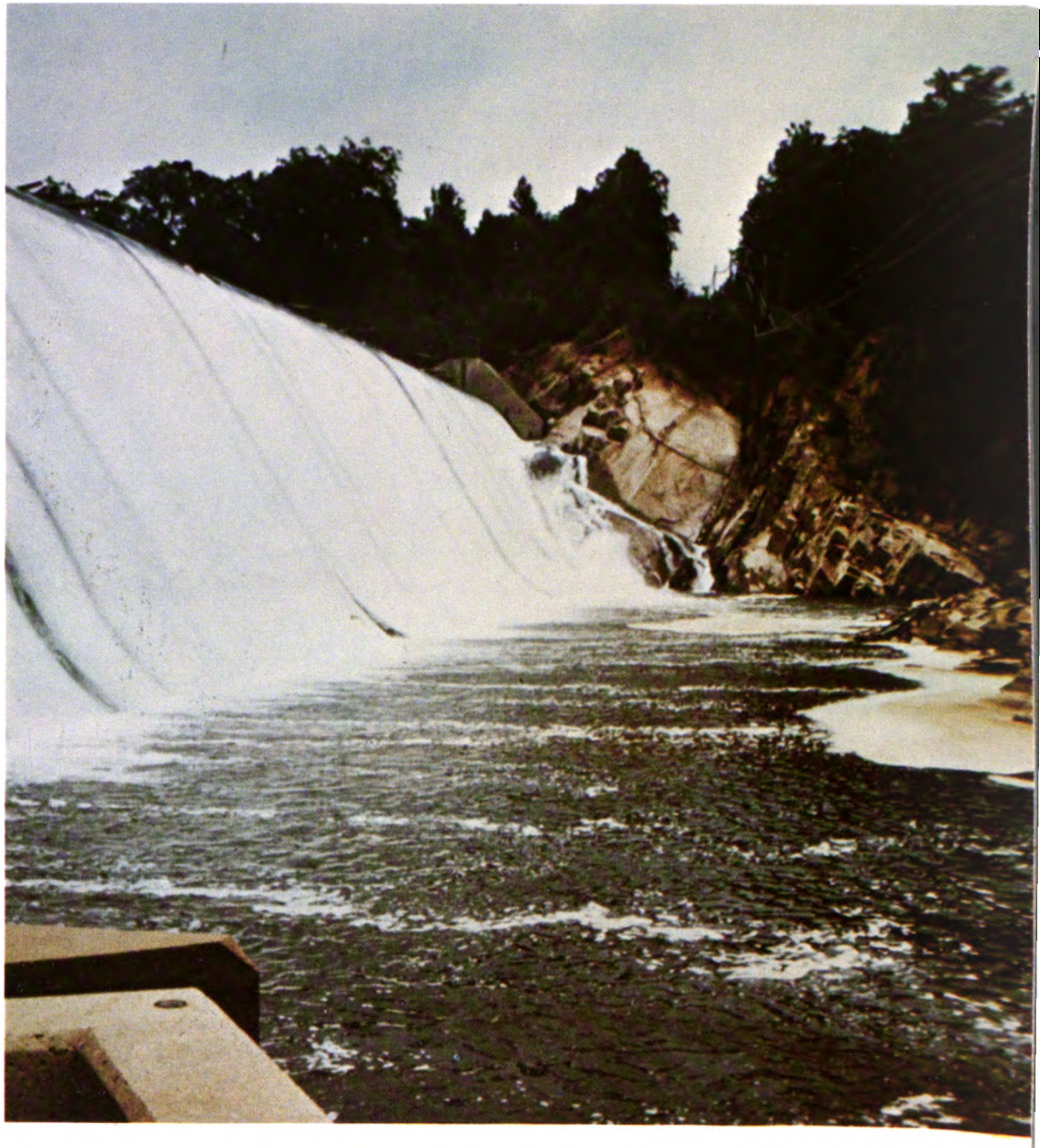
By the time Agnes reached the middle of Georgia, most of the rivers were in spate. At the confluence of the Ocmulgee and Oconee Rivers where they form the Altamaha River, the water was high – much higher than usual. Floods are not unknown to the people who live by the rivers and they were ready for the high water which would bring down the rich topsoil to replenish the starved land and help the cotton and tobacco crops.

As Agnes moved across Georgia, the Savannah River crested to a height most people had never seen. Except for some heavy flooding, no great harm was done.

At the Savannah District Office of the Army Engineers, the District Engineer talked on the telephone with the Georgia and South Carolina Governors' offices. The governors were concerned, because of the torrential rains, about the safety of the Clark Hill Reservoir above Augusta and the Hartwell Reservoir far above that. Both reservoirs are on the states' boundary line. If either of these dams should break there could be catastrophic flooding along the Savannah River, in Augusta, and at the huge atomic energy plant just south of there. The Engineers were sure the dams would hold. They did.

19 June 1972





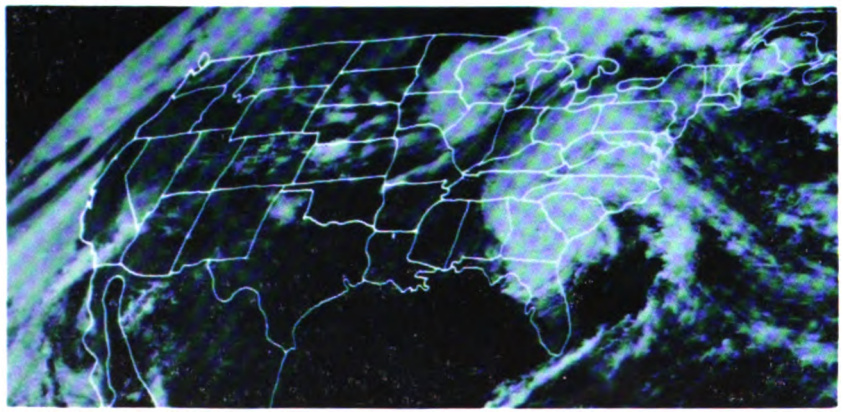
By Tuesday, June 20, Agnes had been downgraded again, this time from a tropical storm to a tropical depression. But she plodded ahead and her center arrived in South Carolina that evening. She threatened the historic covered bridge over Long Cane Creek, small brooks became torrents and overflowed their banks, and her heavy rains now preceded her well into the Middle Atlantic States.

Agnes poured so much water on Lake Murray, above Columbia, the capital of South Carolina, that the people were apprehensive, but the dam held; so did those that held back the waters of Lake Marion and Lake Moultrie.

Agnes surged along causing trouble wherever she went. She moved into North Carolina where, after days of heavy rain, many rivers were approaching flood stage.

Then, perhaps brooding because she had been downgraded to a tropical depression, she took on new life. She started to accelerate when she reached Raleigh, North Carolina's capital. Without apparent reason (and Agnes was certainly unreasonable) she

20 June 1972



increased in intensity to such a degree that the National Weather Service again called her a tropical storm.

Once again, Agnes with her renewed strength took off for the northeast. She crossed Dismal Swamp, Norfolk, and Cape Charles; she headed out to sea after the fashion of most hurricanes and tropical storms.

Up to now she had not been a particularly bad storm, but none of them are good. She had been devastating and had followed a familiar path. Nothing she did was spectacular except for the never-ending rains that poured down on the east coast for days. Flooding extended from Florida all the way to New York State, but at least she was now out of the way.

Whenever a flood or other catastrophe is imminent, the American Red Cross and other rescue organizations send out alerts for help. Plans for feeding and housing refugees are always made ahead of time. Arrangements are made for food, shelter, beds, first aid supplies, and all the thousands of things that will be needed instantly. Local rescue squads are trained and ready. The Civil Defense is alerted.

While the rains were still falling, they went into action and as each appeal for help was sent out, trained volunteers appeared to provide whatever assistance was possible. They often turned up before they were called.

The Army Engineers went into action when the first warning of a storm was issued from the Hurricane Warning Center. Emergency flood control plans were put into effect and sandbags, bulldozers, and all the other flood-fighting equipment were at the ready in case dikes or bridges needed to be shored up.

Reports from the field were gathered and evaluated at the District offices in Mobile, Jacksonville, Savannah, Charleston,

Wilmington (N.C.), Norfolk, Baltimore, Philadelphia, and New York and coordinated at the Division Offices in New York and Atlanta. The information was also transmitted instantly to the Engineer Emergency Operations Center in Washington. The reports were increasing in number and degree of seriousness.

Posted on the wall of every Army Engineer office was a large sign carrying a simple message: THE CORPS CARES.

Yes, Agnes had left. She had regained her youth but she had gone to sea, although the rains continued and the reports of flooding increased. The weather people were still keeping a sharp and worried eye on her as she headed northeast. The Engineers worked quickly to control the high waters that were developing and they were grateful for the flood control measures that had been completed, because without them things would have been much worse. The Red Cross was bringing relief to people who had lost their homes. Countless other organizations pitched in to help. But the rains continued.

And then it happened. Tropical Storm Agnes changed her mind and decided to wheel back to land.

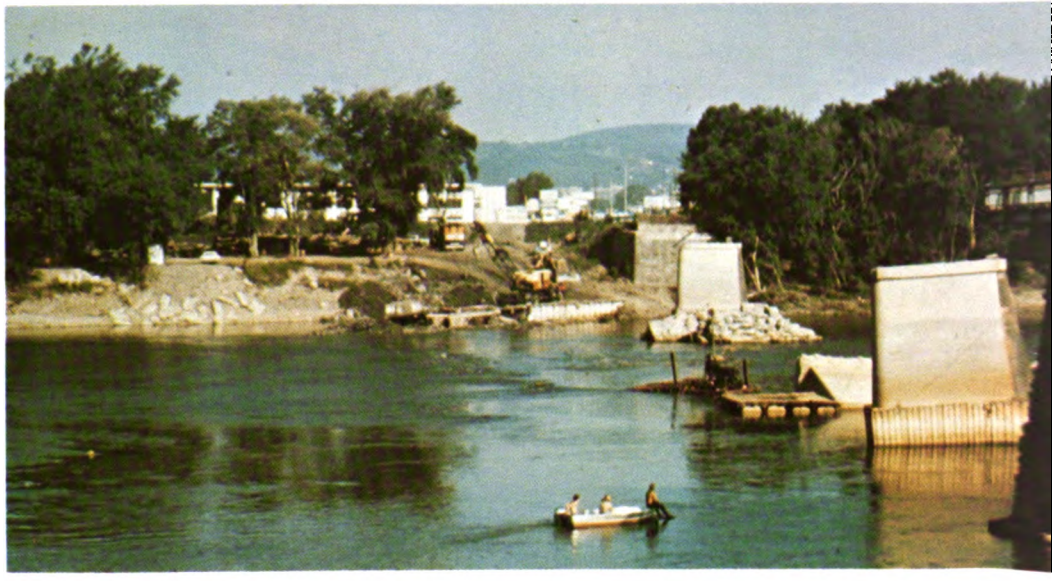
Instead of heading for the northeast, as tropical storms that follow her path usually do, Agnes shifted her course to the northwest and began to turn in a great arc, curving steadily across the Catskills and the southern tips of the Finger Lakes, and moved in the general direction of Pittsburgh. She was keeping a deadly appointment.

While Agnes had been beating her miserable way up from the south, the National Weather Service was also keeping close track of a low pressure system that had been developing over Lake Erie and Ohio. The meteorologists knew that if the two collided there would be even more trouble because when two violent weather systems meet there's always trouble. So Agnes, the troublemaker, moved westward to meet the newcomer. When they joined, the torrential rains increased to unbelievable intensity. The weather pattern became so scrambled that it was almost impossible to keep track of it.

It is inaccurate to say that Agnes followed the strictly limited course shown on the map because that indicates what was presumably the center of the storm. Her tumultuous path was wild and wide, drowning the land from the mountains to the sea and from Lake Ontario to Virginia. She behaved like a giant wheel with central Pennsylvania as the hub. The hardest hit areas were those in Pennsylvania where Wilkes-Barre, Scranton, Harrisburg, and York are located and in New York State around Hornell, Corning, Elmira, Wellsville, and hundreds of smaller towns and villages nearby. She did not neglect Ellicott City and other towns in Maryland and, of course, she visited Washington, D.C.

"We have a major disaster developing!"

The Emergency Operations Center of the Army Corps of Engineers in Washington, like all other Corps offices along the



21 June 1972

eastern coast, was manned around the clock by an augmented staff of military and civilian specialists. Flood conditions in Virginia, Maryland, New York, and Pennsylvania were worsening rapidly. Giant wall maps were being constantly updated as fresh information was received. The men who manned the centers worked rapidly to keep track of the constantly changing conditions and situations as they developed.

The Chief of Engineers, flying over the flooded areas, didn't wait to return to the ground before ordering 100 officers from all over the country to report immediately to disaster stations predetermined by the District Engineer in Baltimore. That was a Saturday morning. By Monday the men had reported to their posts in field gear and ready to work.

The U.S. Geological Survey estimated that the James River at Richmond, Va., was flowing at about 258 billion gallons a day — some 100 billion gallons more than had ever been recorded before. Water spilled over a 32-foot protective dike. Soon almost the entire downtown industrial section was under water and the attempts to halt the flooding by using sandbags were futile. Virginia was placed under a state of emergency.

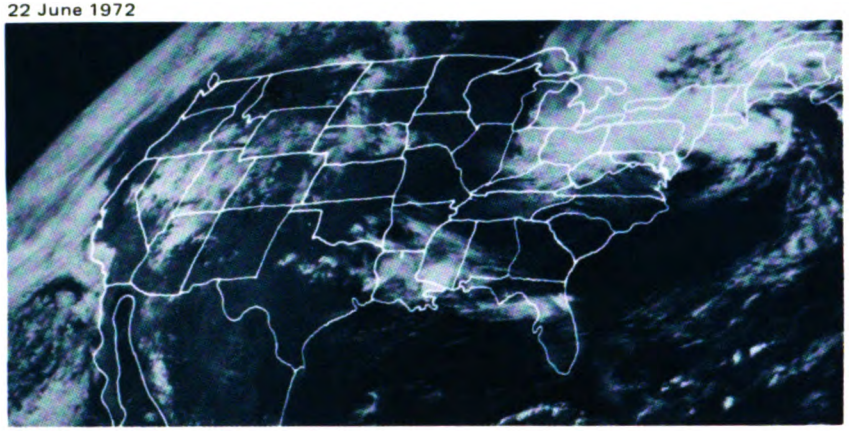
Parts of Washington, D.C., were submerged as the Potomac River crested. Most of the land was parkland, although extensive flooding occurred in Georgetown's industrial section. Several buildings near the waterfront were severely damaged. The sign of one of Washington's well-known businesses was clearly visible: FLOOD PLUMBERS.

Creeks and brooks in the Washington area, usually slow-moving and quiet, became raging torrents. Park benches were tangled high in the boughs of trees. One dam that had been built to form a large private lake was gutted and the beautiful homes nearby soon looked down on a 118-acre mudflat.

Four Mile Run, a stream that passes through Arlandria, Va., in the Washington Metropolitan Area, floods whenever a heavy storm occurs. When the flood warnings were given the residents, as usual, picked up and left for higher ground. Agnes, however, was not a usual storm. She isolated a large shopping center where a fire broke out and burned the stores to the ground while firemen watched, unable to get through the roaring waters.

But this was only her prelude. Agnes had not yet started her most devastating work. By June 23 she had disintegrated over western Pennsylvania but the floods that followed were far worse than any of the winds and destruction that she brought with her. Hundreds of small towns and villages suffered equally with the larger cities. Hamlets and isolated farms were destroyed. A list of the communities that were washed away, either in part or totally, would be a lengthy gazetteer. The pictures shown here could be repeated over and over for the thousands of cities, towns, and villages that were Agnes' prey.

22 June 1972



Surely the most tragic sight was the demolished homes, some floating down the rivers, others splitting in half as the pressure of the water tore at them. The nearly undamaged roof of a house floated downstream followed by the shattered remains of the first and second floor. Hundreds of house trailers were sloshing about – most of them floated for a long time before they sank.

The vastness of the terror and its effects on people's lives were indescribable. Each house, apartment, or trailer had been someone's home where, shortly before, families had lived and were busily raising children, tending gardens, working at hobbies, reading, or pursuing whatever pleasures they fancied. Agnes washed it all away in one dreadful sluice. Thousands of homes were destroyed never to be replaced. There were the homes of the poor, the rich, the inbetweens. Some were rented and others were owned by families who were trying to reach the last payments on lengthy mortgages. Still others were hand-built by the owners who knew every nail, every stud, every corner. The personal attachment a family usually has for its home is deep. It is an attachment and affection built up over years of work, trouble, joy, and memories. Agnes didn't give a damn.

From here on it will be impossible to document the way of Agnes in any kind of brief geographical or chronological order. She was everywhere at once. Her rains and floods covered the Middle Atlantic States. She followed no precise pattern. It is possible, however, to relate a few representative incidents. A complete history of Agnes and her legacy will have to be found elsewhere. Some of the events in the next chapters will be tragic and some will seem trivial, but they are all true and they may, we hope, help the reader to understand what Agnes did.

Elmira, a city of 40,000, started evacuating people early because 14 miles up the Chemung River water was spilling over the dikes that had been built up 23 feet above the river's normal level. The evacuation saved hundreds of lives. Elmira was flooded so completely that it will take years to return the city to normal.

Seventeen deaths in Corning were attributable directly to Agnes. Some bodies were found in houses and others disappeared into the torrent.

Just outside of Elmira, the plant of the American LaFrance Company, manufacturers of fire engines and fire fighting equipment, was severely damaged. Equipment and supplies were seen floating away from the buildings and even fire trucks were reported to be bobbing up and down in the water.

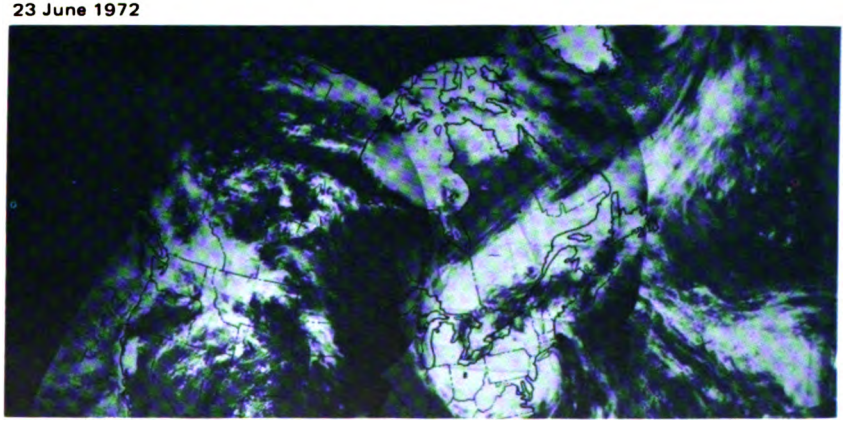
In Harrisburg, as in many other cities, most of the downtown area was flooded. The Governor's Mansion was severely damaged and may take years to restore. Highway and railroad bridges in the vicinity were ripped out and became twisted skeletons of steel and concrete.

Flood waters from the Schuylkill River at Phoenixville, west of Philadelphia, tore down the dikes that protected several large oil storage lagoons. Eight million gallons of used crankcase oil that was to have been recycled were released creating what was described as the most massive oil spill on record.

Forty-eight houses on one street in Elmira were severely damaged. The foundation of one of them, with 2½ feet of water and mud on the first floor, was washed away. An above-ground, 32-foot swimming pool was moved to another street. The basement and side wall of one residence were ripped off; the flood lifted the garage and moved it to another neighborhood where it broke up and floated away.

When the Susquehanna River crested at Sunbury, Pa., and finally started to recede, that city's assistant civil defense director stated that if it hadn't been for the dike "Sunbury wouldn't be here today." At the height of the flood 500 volunteers worked to raise the dike's level with sandbags and timbers. From 100 to 150 tons of sand – all that could be found in the city – were used to reinforce the wall that protected the town from the swollen river.

23 June 1972



In Wilkes-Barre and the area surrounding it, Agnes destroyed the homes of almost 25,000 people; 80,000 were evacuated.

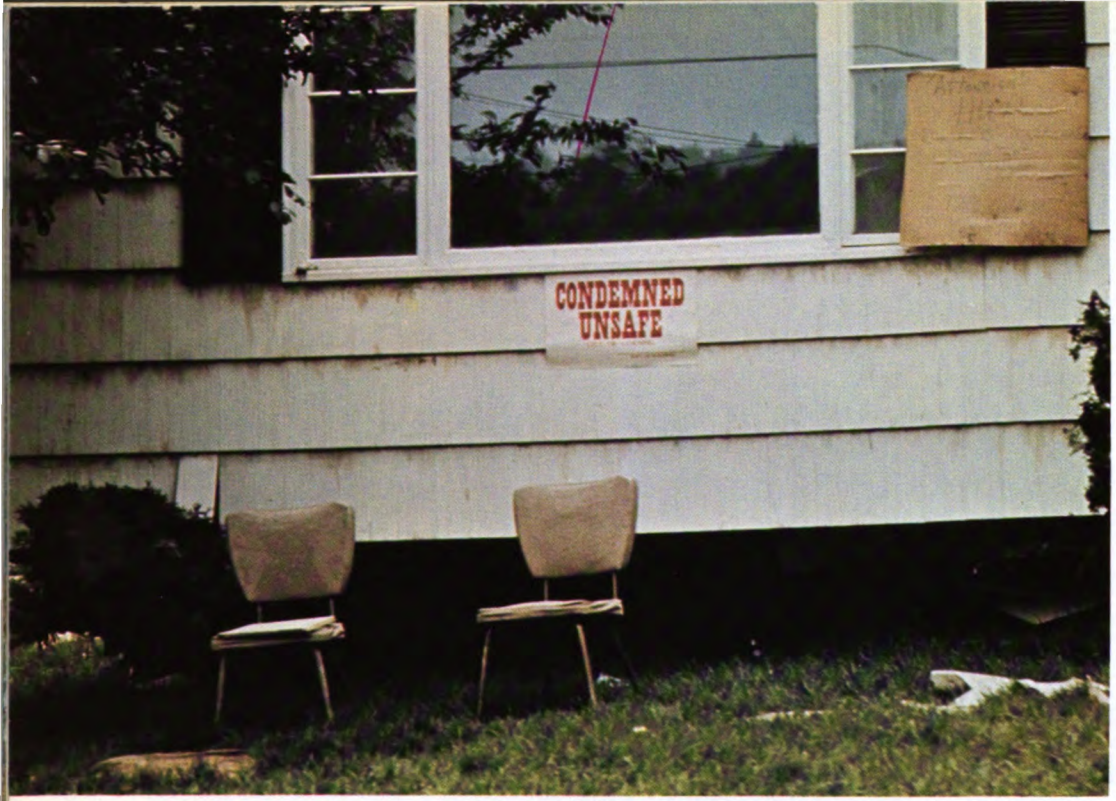
A casket, washed out of a nearby cemetery, floated into a large Elmira manufacturing plant that had been flooded and severely damaged by fire.

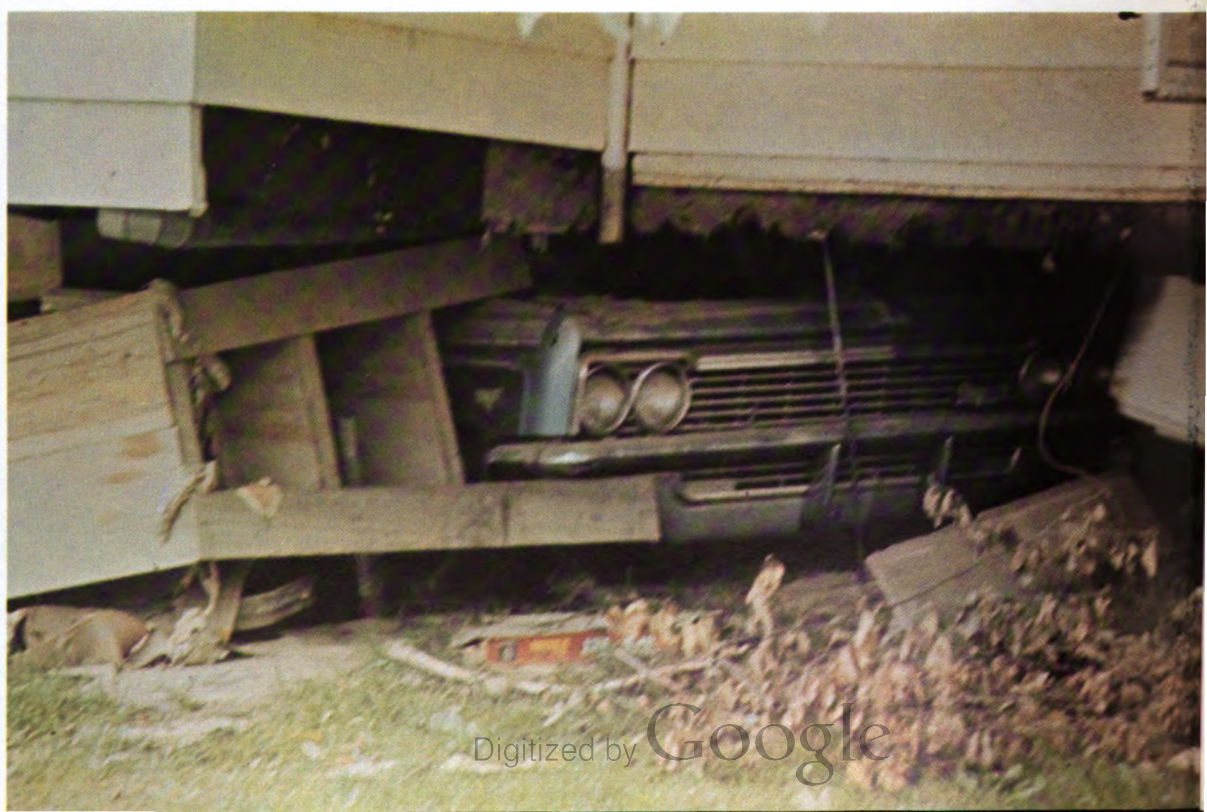
The *Harrisburg Patriot-News* built a new building in the early 1950's. It was built so that the lowest part of the building was a foot above the high-water mark of Pennsylvania's greatest flood on record, the disaster of 1936. Agnes tore through the building destroying nearly a quarter million dollars' worth of newsprint and wrecking the 10-unit color press. The *Patriot-News* missed a publication day — the first time since it was founded 120 years before. The following day it resumed publication with the help of the *Allentown Call-Chronicle.* The same tragedy hit many other newspapers that happened to be in Agnes' way.

The Patapsco River runs through a deep cut at Ellicott City, Md. As the floods rushed through the heart of the city they swept everything before them. The bridge buckled and was demolished, the railroad trestle was put out of commission, the C&O—B&O tracks were washed away, and the home of Jonathan Ellicott, a 200-year-old stone mansion, was split in half and damaged beyond repair.

All 53 floodgates were opened at the mile-long Conowingo Dam on the Susquehanna River in Maryland. It was the first time they had all been opened in 40 years. The water passed through at more than a million gallons a minute. The dam held, although $2 million in damage had occurred in the area.

An Elmira newspaper illustrator, making quick sketches of the flood, captioned one drawing: *House Damaged by Passing Garage.*





A family in Ellicott City saw the house they had built with their own hands destroyed. "The only thing showing was the roof. There were tank trucks bobbing about like toys and houses that floated down and smashed into trees. When we walked back they were still taking bodies out of the river. We lost between $25,000 and $30,000. The other day I made a mortgage payment on the house."

The villages of Swoyersville and Forty Fort, Pa., each with a population of over 6,000, were gutted. Eighty percent of the town of Swoyersville was inundated.

Two veteran Red Cross officials who viewed the wasted area near Corning and Painted Post, N.Y., stated, "Nowhere have we seen such evidence of the violent torrents of water that passed through this area. The destruction far exceeds anything we've seen during our tour."

The Chairman of the Red Cross Disaster Service commented, "It looks like the river just came whirling through, twisting and spinning everything around . . . just unbelievable."

By the time Agnes had disintegrated over western Pennsylvania, she had dumped an estimated 28.1 trillion gallons of water over the eastern seaboard, the equivalent of 25.5 cubic miles of water. Most of it was poured on the Middle Atlantic States.

Streams and rivers were flooded—13,500 miles of them—and more than half a million people suffered losses. An estimated 116,000 homes, 2,400 farm buildings, and 5,800 businesses were damaged or destroyed. At least $2.5 billion was lost in private and public property. Damage to highways, bridges, and public buildings amounted to more than $700 million.

It seems grim to say that "only" 118 lives were lost, but considering the extent and viciousness of Agnes and her floods it was an amazingly low figure. The reason, of course, was that most of the flood control measures were adequate. Where they were insufficient, the results were devastating.

Help, Heroes, and Hope

A hundred tiny fountains suddenly appeared in the front yard of a house in Wilkes-Barre. It was "mine water" from an abandoned shaft underneath, and the pressure of the floodwaters forced the mine water through any small openings in the yard.

The first floor of the Wyeth Museum at Chadds Ford, Pa., was flooded when Brandywine Creek overflowed. Museum officials hauled over $2.5 million worth of paintings to the second floor where they were safe from the rising waters. A museum spokesman said he saw "fish and frogs swimming outside the museum windows."

A Wilkes-Barre fire fighter who was stationed just outside the flood area was called home by his wife as the flood waters rose. When he arrived he saw his garage, with his car inside, and a large tree next to the garage disappear into the ground. The waters had opened an empty mine shaft which literally swallowed his garage and the tree. His wife was saved.

The Baltimore District Engineer, an Army officer in charge of the area where the greatest flooding was taking place, left his home south of Baltimore to rush to the District headquarters. The routes he normally could have taken were either flooded out or so jammed with traffic that he was unable to get through. His deputy, who had managed to get to the headquarters, kept in touch with him by radiotelephone and informed him of possible routes that were still open. He reached Curtis Bay, where the Patapsco River meets Chesapeake Bay, and boarded the Corps of Engineers patrol boat, *Choptank*, which took him to Ft. McHenry. He arrived at the Engineer offices in Baltimore at 1:30 P.M. after a six-hour trip that would ordinarily have taken less than an hour.

Near White's Ferry on the Potomac River, there is a large farm located on an island. When the flood waters rose, so much of the farm was covered that all the cattle and farm vehicles were huddled together on a plot of ground about 30 yards wide and 100 yards long.

The red brick memorial to John Brown at Harper's Ferry, W. Va., was under water.

A 70-year-old restaurant owner in Ellicott City was trapped when the water rose from the basement into his restaurant and finally reached up to his apartment on the second floor. Four friends from apartments in the same building were also trapped. Two boys showed up in a small boat, took off two women and a child, and returned for the two men. Overloaded, the boat overturned. The two boys and the other man somehow managed to reach a garage roof. The restaurant owner caught a one-way traffic sign under the surface of the water and clung to it long enough for the boys to haul him to the garage roof by his belt.

A frail, middle-aged lady in Harrisburg left her flooded house by rowboat, but her husband wanted to wait it out a bit to see how bad it would get. Some time later, at the National Guard Armory, stunned and huddled in blankets, she said, "I haven't seen him since."

In the flood areas the radio stations that hadn't been washed out were on the air constantly, providing information:

"If you have any bags or pillow cases, put them in front of your house and they'll be picked up."

"We need bags, pillow cases, shovels, and sand."

"If you have plastic bags, use two for sandbags, one inside the other."

"We need more men at the dike to fill sandbags. Bring shovels and trucks if you can."

"Cut off any electrical appliances."

"Shut off the gas."

"Bring anything that will hold sand."

"Police are monitoring all evacuation routes."

A York family was separated by the flood. The mother and father couldn't get to their five children waiting for them at their summer cottage a few miles from town. The cottage was normally several hundred feet from Conewago Creek, but the water was now within 50 feet of the house. The oldest boy, 15, kept in touch with his parents by telephone until the lines went out. A neighbor, also stranded, joined them with her three children. Another neighbor offered to let the 15-year-old drive her car to safety. She planned to stay and climb a hill, if necessary. "But I never drove a car," he protested. "You will now." The boy, eight passengers, and two dogs packed themselves into the car. The advice from his passengers was deafening. The water was eating away the road in many places as they lurched along trying to find higher ground. A bridge almost collapsed under them. Finally they spotted a house on high ground and turned in – safely.

Next year, when he is 16, he plans to take his driver's test.

An official of the State of Pennsylvania, after talking with people who had suffered extreme flood damage, commented, "Today they are too busy for tears."

The flood hit owners of new and used car lots exceptionally hard throughout the area. Their inventories of cars were outdoors and usually on the flatlands near the rivers. One dealer alone, in Kingston, Pa., lost about 375 vehicles and all his records. His estimated damage amounted to $1.5 million.

A small foreign car was floating down the river, formerly a street in Elmira. It was heading directly for a large gasoline tank that had been washed away from a nearby service station. If it struck the tank at the speed it was traveling, there would almost certainly be an explosion. A policeman in a small boat saw what was happening and heaved his anchor through one of the windows of the car. The car rolled over and sank just in time.

A five-story wing of the Jones Memorial Hospital at Wellsville, N.Y., on the banks of the Genesee River was undermined and fell into the raging waters. Fortunately, all the patients were evacuated in time and moved to safer ground.

After ten days of working without stop, the Salvation Army ordered all its officers to get at least two hours of sleep each night.

Telephone lines were tied up in the Scranton and Wilkes-Barre area. Calls were limited to those involving emergency messages, supplies, installation repairs, and construction work.

The Defense Civil Preparedness Agency established a communications network which combined the Citizens' Band of about 150 units, the Radio Amateur Civil Emergency Service, the Eastern Area Civil Defense, and the Pennsylvania State Police communications system. The network cooperated with the State Police who coordinated helicopter rescue missions. This skillfully coordinated effort, which included hundreds of military and civilian volunteers, rescued an unknown but large number of trapped people.

The Pennsylvania State Game Commission placed mobile radios in rescue boats so that throughout the flood areas helicopter and boat rescue efforts could be coordinated.

Volunteers, many of them teenagers, not only worked until they fell, but they frequently assumed command when others who were willing to help couldn't figure out what to do.

A former resident of Wilkes-Barre who now lives in Tucson, Ariz., went to Wilkes-Barre and manned the Game Commission radio at Civil Defense headquarters.

In Kingston, Pa., a community of about 6,000 homes about two miles up the Susquehanna River from Wilkes-Barre, only about 20 homes were unaffected by the flood waters.

A middle-aged lady was being taken from her home, which was about to be washed away, by the local rescue squad. The rescue men were horrified when she left the second-story window where they were to "get something I have to have." She returned seconds

later with a box of facial tissue. Afterward she could give no explanation of why she needed the tissues.

A woman in Gang Mills, N.Y., took her two children to her next-door neighbors', "because it has a second floor." She left her nine-months-old baby in the arms of her neighbor and returned to her house to get a flashlight. While she was rushing to her house, the floods washed away the foundations of the neighbors' house, her friend fell into the basement, and the flood sucked the baby from her arms. Six days later a State Conservation Department man saw a tiny hand sticking out of the water. At first he thought it was a doll.

In Wellsville, 2,000 victims of the flood were being fed daily by the Salvation Army.

Thousands of barrels and drums containing harmful chemicals and explosives floated out of warehouses and into the rushing torrent of the Schuylkill River. The Army Engineers and the Environmental Protection Agency issued warnings so that people would not open or tamper with them under any circumstances.

A British aviatrix who had flown her small Piper Cub from the Equator over the North Pole was planning to make a similar flight over the South Pole. She had put her plane in the Piper factory at Lock Haven, Pa., for repairs when Agnes took over. Although it was moved to the highest ground possible, the water flooded the cabin. It will never be able to do long-distance flying again.

Shickshinny, Pa., is a 111-year-old town on the Susquehanna. Every business in town suffered severe damage. Mannequins were seen floating out of display windows and bobbing down the river like corks. A man directing traffic, caught in a landslide, was pinned against a house with mud and debris up to his chest.

Volunteers dug him out. The long bridge over the river at Shickshinny was demolished.

When the Pennsylvania State Police were forced to abandon their barracks, a new command post was set up in a state park near Kingston. The new post consisted of a few parked State Police radio cars.

A family of four sought safety from the flood by climbing to the roof of their home. The water lifted the house and floated it down the river. All four were rescued by helicopter.

A State Trooper and two men from the Pennsylvania State Game Commission rescued a paralyzed man trapped in the upper floor of his home at Forty Fort, Pa., by going to the house by boat and breaking in.

At least 40,000 telephone directories in the Wyoming Valley of Pennsylvania were lost. When the lines are replaced a system without directories won't be much good, so they will have to be reprinted.

The Plymouth, Pa., Rescue Squad and Fire Department, under the direction of the Civil Defense chief for that area, rescued 600 persons by boat; 50 of the rescued were invalids.

The floods did millions of dollars worth of damage to crops and farmland. The rich topsoil was washed away and replaced by deep

gullies. Countless crops were completely lost.

The Wilkes-Barre General Hospital put its disaster procedures into effect at 3:00 A.M. on Friday, June 23. By 8:00 A.M. over 150 patients had been admitted, many from endangered hospitals and nursing homes. The hospital's normal capacity is 360. By converting nurses' quarters, classrooms, and any other available space into wards it was able to care for more than 500 patients. The next day General Hospital treated 400 emergency cases, and the same workload continued. Ambulances were lined up bumper-to-bumper while nurses and doctors, many of them refugees themselves, worked rapidly and efficiently. When the hospital's telephones went out, one of the doctors moved his radiotelephone from his car into the hospital – it was the hospital's only communication link to the outside world for four days. The hospital operated so quietly and effectively throughout the crisis that it was properly called the "Island of Normality."

In the Elmira area a dancer whose specialty was wearing nothing but an eight-foot python lost her pet in the flood. She applied to the Small Business Administration for a loan to buy another snake.

In Allegany County, N.Y., a man and his young daughter drowned when the boat in which they were attempting to leave their home capsized.

Many sewage treatment plants were knocked out by the flood and raw sewage had to be directed untreated into the rivers. In most cases it would take several weeks to repair the damage and again operate the treatment plants.

At Alfred, N.Y., a baby girl was born at the height of the flood in an emergency center set up in Alfred University. The village of Alfred was isolated by the flood and it was impossible to get ten miles to the nearest hospital. The child was not named Agnes.

The father of two Wellsville youngsters was contemplating his basement that was filled with water. His two sons were playing with two other boys. They had just turned the garden hose on and were squirting each other. The father's comments have not been recorded.

"If I were 26, I'd start all over again. So I'm 52 and I'll start all over again," said an Elmira optometrist as he left his office carrying an adding machine, the only thing left that had any value.

In Bradford County, Pa., 11,000 of its total population of 57,500 people were displaced by the storm and flood. Many of them had no homes to return to. At Towanda, the county seat, the Susquehanna crested at 33.25 feet – the previous flood record was 25.02 feet in 1936.

The Civil Preparedness Control Center in Wellsboro, Pa., had been under sharp criticism as being an unnecessary frill. It was manned 24 hours a day during the storm, coordinating the efforts of police, military, firemen, and rescue teams. They were in touch with all other rescue groups. The radio communications chief went without sleep for three days until he collapsed. He was placed in the intensive care unit of the Wellsboro hospital where he recovered.

Nearly half of the doctors' and dentists' offices in Elmira were severely damaged. Thousands of patients' records were lost as were medicines and prescriptions. Refilling prescriptions, for example, would frequently require a doctor to rely on his memory if it was impossible to re-examine the patient. Fortunately, as one doctor put it, "Doctors have an uncanny ability to remember."

The young Washington couple who enjoyed an evening at the Olney Theatre found, when the play was over, that all roads were blocked and they would be unable to get home. The telephones were still operating so they were able to get in touch with their baby-sitter whose parents took over. Most of the theatergoers stayed in the theater that night with 50 others who sought refuge there. At about 5:00 A.M. the Red Cross arrived and set up an evacuation center for the now 250 people who had been arriving all night. The star of the Pulitzer Prize-winning play, a nationally known actor, spent the morning hours cooking scrambled eggs and bacon which had been provided by a nearby general store in Sandy Spring.

In Wilkes-Barre a city policeman, a Roman Catholic priest, and a telephone company employee helped rescue more than 30 flood victims. Among them were an elderly lady who was stranded in a building adjoining one that was on fire — they had to break through a wall of the building and wade chest deep in water to get to her and five other elderly people on the second floor of the same building; four children and three adults from an apartment building; several old people trapped in a hotel; and a bearded youngster who refused to leave without his two pet cats.

About a mile north of the District of Columbia line, Rock Creek was flooding and inundating a wooded area and a wide clear meadow at Forest Glen Park, Md.

Three exuberant teenage boys decided to get in their car, see the flood, and perhaps even take a swim. Intoxicated with excitement and seeking a thrill they drove into the water which immediately swept them and their small car away. Horrified bystanders saw them disappear into the midnight blackness.

The boys were washed against trees which they were able to cling to. Firemen and rescue teams were unable to get near them. One boy was in the water up to his chest and his two companions were able to climb to branches a few feet above the water. All boats in the area were being used elsewhere but one was finally located and launched. It quickly capsized and was demolished,

throwing a fireman into the water. He, too, was able to find and cling to a tree.

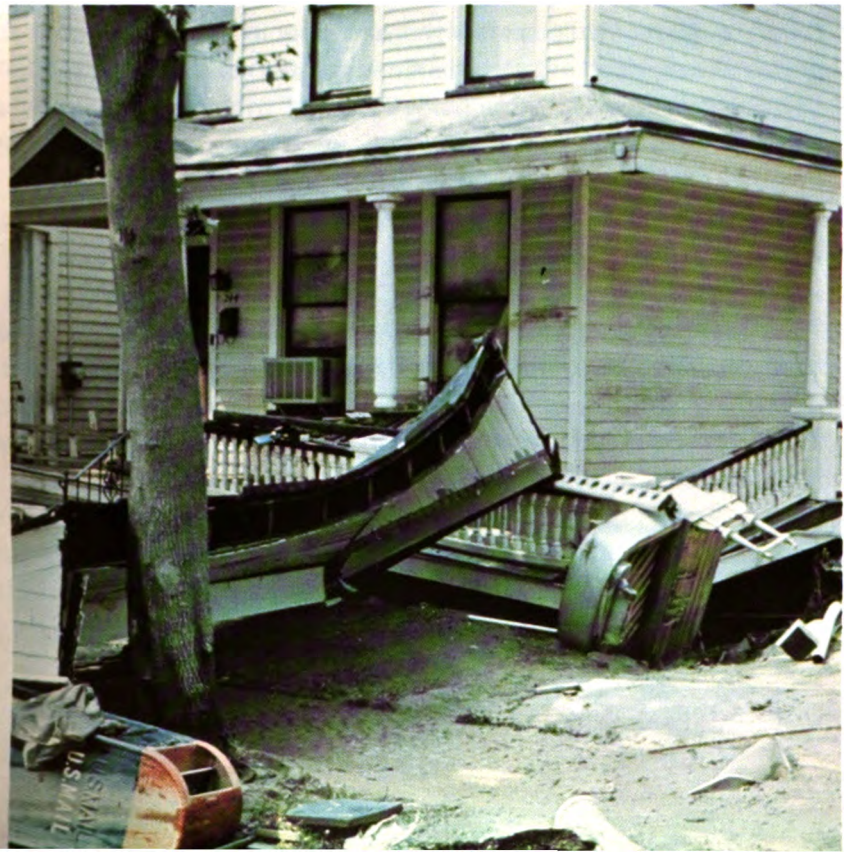
A helicopter arrived at dawn but was unable to get close enough to help. The risk to the victims and bystanders was too great to fire lifeline guns. A rope, provided by a gentleman who lived nearby, was successfully thrown to one boy who lashed himself to his tree.

Soon after dawn another boat was found. It took two outboard motors to fight the current and the three boys and the fireman were rescued. The boys had been in the trees from midnight until 9:30 A.M.

The Pennsylvania lottery tickets were destroyed by the flood – 60 million of them and paper to print that many more. The lottery drawing was postponed.

In Sunbury, a young man saw a neighbor hanging on to a fence trying to rescue a 13-year-old girl who had been washed downstream by the flood. She had managed to catch and hold on to a tree limb. He grabbed the girl by the neck and pulled her to safety. Shortly thereafter his father, attempting to leave a building where they had sought shelter, saw a dead man floating by. He caught him, pulled him inside, and unsuccessfully tried to resuscitate him. Police came by in a boat and rescued them. Fifteen minutes later the building collapsed.

This is only a small sample of the stories that have come from Agnes' visit to the eastern seaboard. Thousands of others are more heroic, more poignant. But perhaps these few will give the reader a slight idea of how people behave under stress.



When "the waters returned from off the earth" they were replaced by that very best in people that surfaces when disasters occur. People helped people. The work was not glamorous, it was not fun. It was work – dirty, backbreaking work. People couldn't do it alone.

The enemy was no longer Agnes – she had gone.

First, neighbors helped each other and then the volunteers and organized relief parties came and filled the immediate needs of providing shelter, food, and the thousands of things that individuals couldn't get for themselves. Churches, schools, and other large public and private buildings housed the homeless. Disaster centers were set up to supply the relief workers with the tools and equipment they needed and to coordinate the efforts of those who came to help. Medicines arrived and people were inoculated to protect them from the contamination that was everywhere. A farmer from Roscoe, N.Y., made repeated trips to the flood area with his tank truck filled with artesian well water; and he was not the only one. Everybody pitched in to help.

The people started slowly returning to their ruined homes, places of business, and mud and debris.

What do you do when you have to remove three feet of mud from the first floor of your home? First you look for a shovel and, if you are lucky, you find one. Mud is too heavy and elusive to shovel around very well so you try to find a pail, but the pails have been washed away or buried. Eventually you find one.

You reach through a blown-out window and probe with your shovel to find out if the floor is still there under the mud. It is. So you climb through the window and slide into the muck and feel it

Picking up the Pieces

ooze up your legs inside of your trousers. It's hard to move around, so you stay close to the window in case you slip while you are working. You try scooping up the mud with the bucket and that works pretty well for a while but you try the shovel again. You keep shoveling and scooping and start counting to see how many scoops it takes to make the level on the wall drop an inch. It takes a lot of them. At least it's better than what an Army officer saw when he came across a group of boys and girls at 2:00 A.M. scooping mud out of a house with their bare hands.

It's too bad your front door opens inward because if it didn't you could open it and shove the mud out the door. So you concentrate on working on the mud near the door. Eventually you are able to move it slightly. A neighbor pushes while you shovel and finally the mud starts to pour out. You go to your neighbor's house and help him do the same thing.

While you are shoveling you strike something solid. It turns out to be the sofa that was a wedding anniversary present you and your wife gave each other last year. Your shovel catches on something on the floor — the rug. You keep moving the mud toward the door. The mud curls around the sides of the shovel and seems to go right back where it was.

The garden hose is still hooked up, but strung out fifty feet along under the mud. You unearth it and turn on the water. It works. You try to move the mud out of the house hydraulically.

Finally most of the mud is outside and you start throwing out your furniture because it can never be used again. Everything is heavy with mud. The piano will have to wait until you can get help and so will the upholstered furniture because it is so weighted down with mud. You throw out treasured books, smaller pieces of furniture, and the television set. (You spotted the television early on because the rabbit ears protruded from the muck.) You find a folder in the broken desk with your valuable papers in it. You take it upstairs and spread the papers out on a bed to dry. Maybe they'll dry out enough so you can clean them off and read them. There's that antique chess table with the marquetry inlay. You picked it up cheap at an auction and spent one entire winter refinishing it. You find two legs and a couple of pieces of the inlay. The rest is gone. You keep on working.

A car pulls up front and two men and two women get out. They are bringing shovels, buckets, brooms, mops, and brushes. They tell you they are Mennonites. They and about 250 other members of their religious group have driven 85 miles to get here.

"It's only a little bit . . . something we can do to help."

The men shovel the muck and move the furniture out. The women shovel, mop, and scrub. The floors have a concrete-like patina that must be removed and it's heavy, hard work. When you see how warped the floors are, you wonder if it's all worth it. The Mennonites clean things up as best they can and move on to your neighbor's house.

You hear them say, "We're from the Mennonite Disaster Service and we'd like to help."

You sit down on the scrubbed stairs and, for the first time, you weep.

After a minute you stand up and get back to work.

About sixty teenagers, both girls and boys, from the St. Luke Lutheran Church in Silver Spring, Md., more than 100 miles away, spent the month of July in Harrisburg. They worked in shifts, shoveling mud and cleaning. First they cleaned up a few churches so that refugees would have a place to stay and then they moved to private homes where elderly people were unable to cope. They slept on the floor in sleeping bags. On weekends 20 were usually on the job and during the week there were eight or ten. They each paid $5.00 for the privilege of working all week and $2.50 for weekends only. The fee covered gasoline and cleaning supplies.

Whatever happened to the generation gap?

Before the flood waters had receded, the Office of Emergency Preparedness set up a hundred centers throughout the disaster area to help the nearly half a million homeless people. The President had declared portions of Pennsylvania, New York, Maryland, Virginia, and Florida as major disaster areas and Congress quickly appropriated $200 million for relief to add to the nearly $100 million that was already available.

The Army Engineers were already shoring up dikes, cleaning up debris, and starting to repair bridges, sewage disposal plants, and water supply facilities. The magnitude of the task was appalling. As the big Army trucks rolled in with bulldozers, front-end loaders, tank trucks with water, and all the other equipment they had assembled, the people felt that hope was in sight. They started immediately cleaning the streets and hauling away the debris. They seemed to be everywhere, wearing their distinctive red jackets and their lapel buttons that read: THE CORPS CARES.

The Office of Emergency Preparedness had directed the Engineers to take over the massive cleanup operations and they were ready for it. During the flood they had been working on the dikes and rescue missions so they knew where the trouble was and how best to handle it. Their first job was to clean up the debris and wreckage that hindered all other operations. Next they had to help restore power, water, and sanitary facilities. They were also directed to make temporary repairs to uninhabitable houses, repair bridges or erect temporary ones, help fix highways, develop sites for mobile or other temporary homes, and try to put the area back into some semblance of livable shape. In all of these operations they cooperated closely with a hundred other Government and private agencies that were also working around the clock. It was a gigantic task and officers and civilian employees of the Corps were flown in from all over the country to assist.

The young majors and captains who took immediate charge arranged to have most of the work done by private companies, using local contractors whenever possible. Initially, the Corps representatives had been given no formal "missions." They had been told to get out there and do whatever had to be done. They were trained for it. They did it. Anyone capable of working was given a job immediately. Anyone with a truck was sought out and assigned to a specific effort. There was no red tape, no signed contracts; an "OK, start over there" was contract enough. Sometimes a contract was sealed by a nod of the head. The paperwork would follow later. People who were entrenched in the bureaucratic way of doing things would shudder, but that's the way it had to be done and it worked. Pretty soon National Guardsmen were at intersections directing traffic. Things were starting to move.

The Defense Civil Preparedness Agency, formerly known as "Civil Defense," lent specialists and equipment to the relief workers. One of its most important contributions was keeping the lines of communication operating for all the organizations working together in the field.

As the tired days went by, trucks moved slowly down a street, loaded up with the things people had thrown out of their houses, and hauled them away to huge dumps outside of town. By the time they returned, more mountains of trash had accumulated in the same places. Some of the trucks were operated by local people and others were from places as far away as the Mississippi River.

Bulldozers scraped the streets of drying mud. Cars moved cautiously, hoping there would be no unseen pits under the surface to trap them. By now the mud was hardening and the smell and decay of sewage filled the air. Dirt and dust penetrated everything. Workers donned masks and kept moving. Rats started to appear in the dumps and sometimes in the homes. The U.S. Public Health Service joined forces with the local and State health authorities to fight them and the diseases the rodents were sure to bring with them.

Water purification units were set up by the Engineers and the Navy Seabees brought in tank trucks to supply drinking water.

Sewer systems were more of a problem. Miles of pipes would have to be replaced in many cities and when the trenches are dug for new pipes, there is always the chance of damaging gas, water, telephone, or power lines. In many cases the plans that showed where these lines were located had been lost in the flood so it would be a matter of inching along carefully or trying to find people who could remember where the lines were in certain areas.

Restoring transportation routes was another one of the first things that had to be taken care of. Federal and State highway crews began to rebuild the roads that had been gutted. In a remarkably short time most of the major roads were passable.

Bailey bridges were brought in from the Army Engineer depot in New Cumberland across the river from Harrisburg, and from another in Marion, Ohio. Bailey bridges look like giant Erector sets and were, in fact, designed on that principle during World War II. They are expandable both in length and width. They are easy to

store because they come in small sections that can be added to and, if solid piers are available, they can be extended indefinitely.

As reports of destroyed bridges came into the Baltimore Engineer District Office, assessments of damages were quickly made and, if it was advisable to erect a Bailey bridge at the site, the units were trucked there immediately. When they arrived, Engineers were on hand to oversee construction by contractors. The Engineers had a training film on how to erect the bridges. In one instance, they showed it to a contractor on Sunday and the bridge was in place the following day.

One harassing problem was flat tires, because the moving equipment had to travel mud-covered ground without knowing what was under the surface. In two weeks there were 400 flat tires – about half of them on the big heavy front-end loaders which are fitted with tires specially designed to carry them over the toughest terrain.

One disaster control center was taken aback by a request to buy or borrow every hair dryer in the area. The telephone company was getting back into service by washing the mud out of their switchboards and drying them quickly with warm air – hair dryers were ideal for getting to elements that were impossible to reach by any other means available at the time.

At Laceyville, Pa., a ferry was improvised to replace a bridge that had washed away and closed U.S. Highway 6 to traffic. The ferry, or raft, consisted of rubber boats lashed together and propelled across the river sideways. It was 75 feet long and could carry four cars or two trucks. Grateful citizens gave the Engineer troops who built it a big dinner in the firehouse.

After the waters had gone down, the Erie Lackawanna Railway appraised the damage that had been done to its tracks and bridges. The destruction was so severe that they found they would be unable to repair the damage and announced that the line would have to go into bankruptcy. The Erie Lackawanna, the 12th largest in the country, was formed several years ago by a merger of two companies each more than 100 years old.

Coast Guard personnel, meanwhile, were working to contain the oil spill that had broken out at Phoenixville, Pa., and was moving steadily down the Schuylkill River. With the help of the Environmental Protection Agency and the Army Engineers, they used straw, vacuum trucks, and filter fences to pick up the oil and prevent it from entering the water supplies of the communities along the river. Trees and shrubbery had to be destroyed because the oily muck extended as high as 20 feet above the banks of the river. If the damaged vegetation had not been removed, the river would have been polluted for years to come. Much of the oily debris was burned. (It wasn't hard to get special permission from the Environmental Protection Agency and State and Federal pollution authorities for the burning.)

At Whitney Point Lake, north of Binghamton, N.Y., the Engineers had built a flood control lake many years ago to protect

Binghamton and the other cities downriver. Two Corps of Engineers civilian employees were checking the swollen lake and the recreational area surrounding it to find out if any damage had been done. The earthen dam had held, but as they circled it their helicopter hit a power line. Both men were killed.

The progress that was being made to bring the land back to life was inspiring. People were working together, helping and encouraging each other. They found that the big impersonal Government agencies had hearts after all and worked with a minimum of red tape — frequently with none at all. Federal, State, and independent organizations cooperated smoothly and helped each other with their problems.

Morale was surprisingly high. One observer thought people were covering their sadness with good humor. Like the Army trucks, many homes flew flags. "Not," as one citizen put it, "because we have suddenly become patriotic. It's more a way of showing that we won't surrender or give up. We'll stay here and rebuild."

In an incredibly short time the roads could be used again and many bridges had been replaced with temporary ones. Most of the dikes had been shored up. But the work of making permanent repairs would continue for a long time.

Refugees in temporary quarters wanted to get back or locate in more livable surroundings. They all wanted to return to their homes, or at least to a permanent place, as soon as they could. They needed money to rebuild, but only a very few had flood insurance. Everyone wanted to return to a life that might approximate that which Agnes had so cruelly destroyed.

The lady in Sunbury, one of a group that had been protesting the floodwall that cut off their view of the river, sat on the front porch of her house. It had been undamaged by the flood. She smiled as she looked at the concrete wall that had been added to the top of the earthen dike. A spray-painted graffito in big bold letters read: WE LOVE YOU, WALL.

The Long Road Back

The energy that people draw on during an emergency can apparently last as long as the crisis continues. When the waters receded and there was nothing left but battlefield desolation people no longer reacted by reflex. No longer did the bravery of the moment make it possible for them to perform superhuman acts. What the people faced now was the grim reality that they had, indeed, lost their homes, their businesses, their jobs, and, in many cases, their families and friends. They desperately needed help and they were getting it.

The Federal Government quickly passed a series of appropriation bills which, with other emergency funds, made well over three billion dollars available for the relief and rehabilitation of the flood areas. It was about twice as much money as the Government had spent for the five largest previous disasters. Private and public property losses amounted to at least $2.5 billion. Business and industrial destruction exceeded $585 million, and the damage to highways and community facilities was more than $700 million.

Two weeks after the flood more than 200,000 people were homeless. At night lights could be seen in houses only now and again. The sweeping and cleaning was still going on. People were tearing down the ruined plaster from the walls of their homes preparatory to repairing. In one town, on a street lined with dirty, damaged houses, one house stood out from the rest: the owner could stand it no longer so the first thing he did was to paint the outside of his house a shining white.

The first job was to move the refugees off the cots and floors of schools and churches into quarters where they could live as families. All houses with extra rooms and all apartments were, of course, taken up immediately.

The Department of Housing and Urban Development (HUD) was responsible for finding shelter for the masses of displaced people. The immediate solution was to provide them with mobile homes. So they set about to purchase every one that was available in the United States and it was far from enough. Companies that make trailers and mobile homes were swamped with orders and

went on around-the-clock shifts. Early summer is a difficult time to get them because it is the peak of the mobile home season and most had been sold or spoken for even before them came off the assembly line.

The Corps of Engineers was assigned the job of building trailer parks and "pads" with the necessary utilities available to each unit. First, along with State and local officials, they had to locate a site, which might be a golf course, an athletic field, a park, or any other open and available space.

After a site was located, they had to make a design so that the trailers would have water, sewers, gas, and electricity. They also had to allow adequate open space around each home. The Corps was, in effect, building instant communities. One architectural firm, under contract to the Engineers, designed a complete trailer community in ten days; twelve architects worked 17 hours a day to finish it. As soon as the plans for a community were accepted, other contractors would start cleaning debris away, digging ditches for utilities, laying pipes and stringing cables, and grading the area for proper drainage. Many times the Engineers gave prospective bidders for these projects only two days to prepare their bids so that the pads would be ready as soon as possible. In a short time the Corps of Engineers was turning over more than a thousand trailer pads a week to HUD.

In order to expedite the delivery of the mobile homes, the Federal Highway Administration asked 35 states to relax their traffic laws. Most states, because of the width of mobile homes, limit their movement to certain days of the week and only during specific hours of those days. The need for housing took precedence over the discomfort of other highway users so that the refugees could be housed as soon as possible.

Not all the mobile homes were set up in parks. Whenever it was possible, they were delivered to the driveways of wrecked homes so that the owner could work on his house while he lived in his trailer. This arrangement also had the advantage of a comparatively easy hookup to existing utilities, providing they were functioning.

Another form of temporary shelter was the use of fiberglass houses similar to those used in Munich to put up the athletes at

the Olympic Games. These units have three or four bedrooms and can be occupied by six to eight people. Each has electric heating, a refrigerator, stove, and bath.

Temporary housing provided by HUD is free of rent for twelve months. After that time a rental program will be worked out for those who are unable to find a permanent location elsewhere.

Most people wanted to return to their homes as soon as they could and, in order to help them do it, the Office of Emergency Preparedness set up a "mini-repair" program to be conducted by the Corps of Engineers. Mini-repair provided enough basic repairs to make a house habitable. The Engineers would check a dwelling and if it was possible to put it in livable shape they would arrange to have a contractor do so at no cost to the owner. They would fix a roof, support a weakened foundation, repair doors and windows, and see that the house had electricity, gas, water, and sewer connections. The cost of these repairs could not exceed $3,000 per house and those who elected to have this done gave up the right to move into a mobile home or other Government-furnished temporary housing.

The Small Business Administration expanded their operations and provided loans to homeowners who suffered damage and wanted to rebuild what was left. Under a new law passed by Congress they could borrow up to $55,000 in low interest (1 percent) loans. The amounts of the loans were limited to $50,000 for the house and $10,000 for personal property but the total amount could not exceed $55,000. The new law also provided that up to $5,000 of the loan would be "forgiven," that is, it did not have to be repaid. It was a good start and enabled a lot of people to recover at least some of the losses they had suffered.

One homeowner said, "I already have a $45,000 mortgage on my house that I have to pay back. If I take this other loan of $50,000 I'll owe $95,000 and I don't see how I'll ever be able to pay it back. If I don't take the loan, I'll have no home!"

Contractors were becoming more and more difficult to find. The Navy's Seabees and the Air Force's Red Horse Squadrons (Engineers) pitched in to help the Army Corps of Engineers get electricity into the homes. The Navy assigned 100 men who had the capability of restoring power to 200 houses a day. They would check the wiring in a dwelling and if it was in good shape they would restore full power. If it wasn't, as was often the case, they would either make temporary repairs or they would make a connection from the power source to the house and install a 50-foot wire with four receptacles that could be carried to the upper floor of the house.

The Engineers contracted for an electrical inspection service. Experts would visit every damaged home and tell the owners what would have to be done to put it in shape. Many members of the electrical union donated a full day's work to help out.

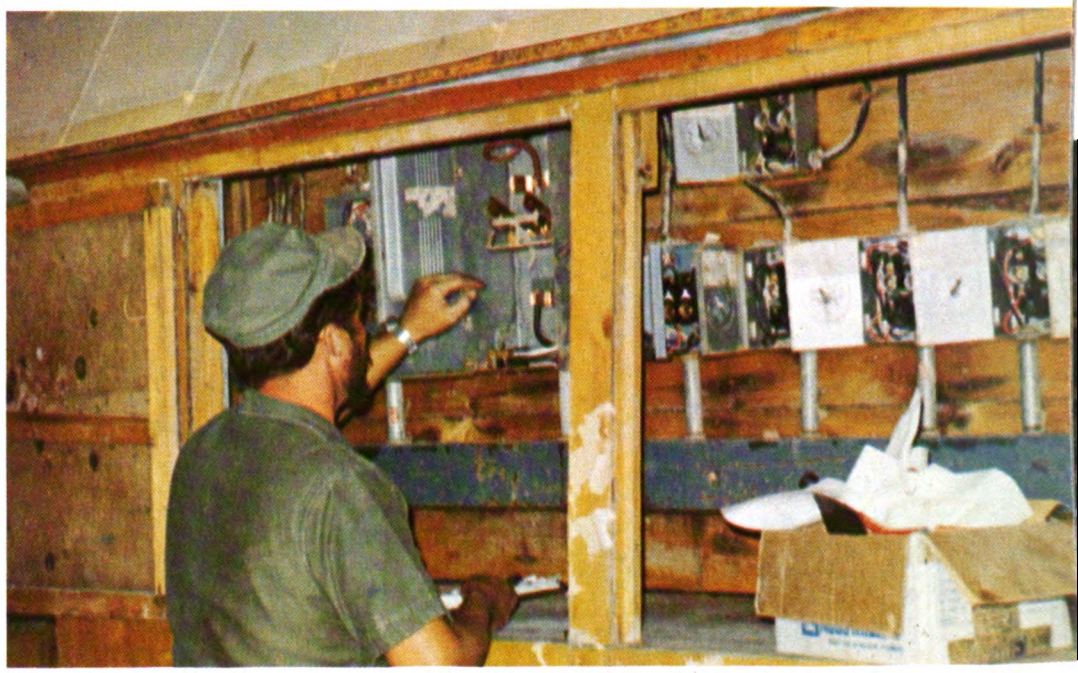
The Corps was using up to 800 contract workers a day in the Scranton and Wilkes-Barre region alone to continue the cleanup of houses and businesses.

People whose homes had to be entirely rebuilt were urged to relocate in areas where the river would not be likely to overflow, but many preferred to remain on their own land and stay in what would again be their neighborhood.

The Office of Emergency Preparedness insisted that mobile homes and other temporary shelters be sufficiently well insulated to protect the people from the oncoming winter. Provision had to be made for heat. About half of the homes that were being repaired wouldn't be ready for the cold of 1972's winter. Temporary housing would, they estimated, be available for all who needed it by mid-September.

While housing was being provided for most of the refugees, the problem of feeding them remained a daily crisis. The Red Cross and other charitable groups were feeding thousands of people every day. The Army Reserves manned some evacuee centers and provided food, medical care, and, with the U.S. Public Health Service, inoculated people against the constant threat of the diseases that always follow in the wake of floods.

The Department of Health, Education, and Welfare directed the U.S. Public Health Service to provide the massive quantities of medical supplies that were needed. They also staffed the clinics that had been set up so that the local doctors who had been on emergency duty since the beginning could return to their own practices and offices. Mid-August came and the General Services Administration relieved the Red Cross of the burdensome chore of furnishing housekeeping essentials to the flood victims.



Very few of the people in the flood area were protected by flood insurance. The rates of private companies were higher than most people could afford and, in some unfortunate instances, people who thought they had protection were not, in fact, covered at all.

The nearly 140,000 workers who were made jobless by the floods needed to be taken care of until they could relocate and return to some sort of normal wage-earning role. Those who were not covered by unemployment insurance were taken care of by Disaster Unemployment Assistance, a program funded by the Department of Labor.

The damage was most dramatic in the cities because of the number of people concentrated in a relatively small area and because of the industries that employed so many people. The rural farmlands also suffered extensively, particularly those located along the soil-rich river banks where the water had washed away the rich growing land. In one Pennsylvania county, for example, the damage to farmlands exceeded $4 million. Most vegetable farmers were wiped out and many dead and injured animals were washed downstream. The damage to wells was a particularly crucial blow to many farmers.

In the cities and along the highways and rivers the rebuilding operations continued. The debris piled up and was hauled away to landfills, some of them so large that there was an occasional reference to "Mt. Trashmore." Much of the debris was sensibly used to fill abandoned strip mines where it might replenish the earth and refill the space that man had created in his frantic drive to get more and more fossil fuel. What will an archeologist think when he digs around this area several thousand years from now and comes across the remains of a television set, a juke box, or a vacuum cleaner that looks like a dachshund with a 20-foot tail and an eight-foot snout with a brush on the end?

Business places were slowly reopening. Their stocks were sorely depleted but there was a doggedness about not accepting defeat that kept them going. Small stores, particularly, made the best of whatever they had and posted signs, some humorous and others grim, telling the world that they were back in business again.

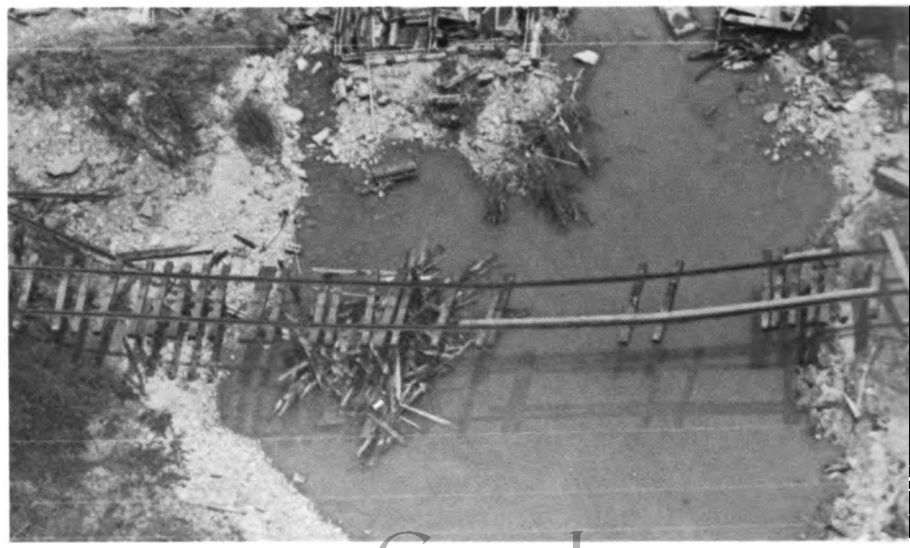
The presidents of four bankrupt railroads told Congress that the flood had destroyed 4,400 freight cars and 1,400 locomotives. The Erie Lackawanna lost 395 miles of track, 186 miles of it main line roadbed; the Lehigh Valley Railroad said it would be two or three years before service could be restored; Penn Central lost six arches of their great bridge that spanned the Susquehanna at Harrisburg; and the Reading wouldn't be able to meet its payroll – it is a commuter line that also links five regional freight lines.

Because of the many Government agencies and private organizations involved in helping the sufferers, the resident who needed help, particularly if he was a homeowner, found himself confused and ensnared in red tape. Recognizing this, the Office of Emergency Preparedness established "one-stop" disaster assistance centers manned by Federal, State, and charitable institution representatives. Their job was to explain to people what aid was available, from whom, and how to go about getting it. Following the immediate disaster relief actions of life saving, the President directed his personal representative to go to the Wilkes-Barre area to coordinate all the recovery programs of the Federal agencies. The arrival of the President's representative gave central and positive direction to the Federal efforts. Red tape and duplication of effort were eliminated. The work of relief and rehabilitation became far more effective and direct.

The cities and towns were beginning to return to life. The Corps of Engineers was soon able to stop the free bus service it had been providing and turn the job back to the city transit systems. About a hundred officers from Fort Belvoir, in Virginia, who were taking the Advanced Engineer Course and had been sent to the flood area to reinforce the Army Engineers already on the job, returned to their studies.

People in many flooded areas noticed that the Corps was digging small holes in the streets all over town. The gas mains and utility conduits had to be drained of water before normal service could be restored.

As the piles of debris and junk grew higher and higher, rats and insects were attracted and some of the mosquitoes were identified as species that were capable of carrying a form of sleeping sickness. Areas were sprayed with non-toxic chemicals and no outbreaks of the disease were reported.



One of the sad parts of bringing a city back to normal was the necessary demolition of uninhabitable buildings that had floated out into the highways or were left in the rivers. Thousands of them could never be restored. With the owners' consent, the Corps of Engineers would destroy them. In one typical example, a fairly large house was razed by a bulldozer which bashed in the walls, causing the roof to collapse. The big bulldozer ran over it several times reducing it to kindling. A large front-end loader then picked up the splinters and loaded it into waiting trucks. It took only a few minutes. The owner watched.

As the cities and towns began to pick themselves up, the sightseers arrived. They came with their cameras, snarled traffic, and asked people who had suffered so much to tell them all about it or pose for dramatic camera shots beside their destroyed property and what was left of their treasured possessions. Understandably, they were not welcome – there were too many things that had to be done and reliving the tragedy was not one of them.

The vultures arrived – the con men and flim-flam artists. They were the ghoulish characters who would, for example, pose as contractors and offer to put a house back in shape. When a gullible or frantic homeowner was taken in and made a down payment, the "contractor" would take the money and never return. Each had his own way of trying to pluck the unfortunate. The authorities ran a constant campaign to warn people against them. Fortunately there were not many of them.

There were a few looting incidents, as there always seem to be following a disaster. A few otherwise decent people would steal from those whose misfortunes left them with practically nothing.

On the other hand, Kingston, Pa., a town hit as hard as any by the flood, had quite another experience. A group of people from outside the disaster area rolled into town in a car pulling a trailer marked "Hope Wagon." They bumped along to a block where people had been shoveling mud and dirt out of their houses for two weeks. They opened up the trailer, set up several barbeque grills, and held a corn roast followed by music, singing, and dancing. The residents found themselves dancing in the street, muddy clothes and all, enjoying their first cheerful night in two weeks.

A green and white trailer from Petersburg, Mich., arrived in Scranton with 1,500 pounds of bedding, clothing, kitchen utensils, pots, pans, water glasses, and anything else that anyone in that small Michigan town thought might be helpful. They had loaded it

all into a druggist's trailer and brought it east. They unloaded it and immediately headed back on their 450-mile return trip.

Meanwhile the Engineers were continuing with their recovery work. They were assisted by the Navy, the Air Force, the Coast Guard, the U.S. Marines, the Regular Army and Reserves, State National Guard units, and hundreds of other military and non-military organizations all working together in one great cooperative effort.

Bridges, twisted and broken in the rivers, had to be removed. Sometimes the Engineers would build a causeway out to the wreckage, cut it into manageable pieces, drive a crane out on the causeway, and swing the pieces to trucks which would haul them away. No two problems were alike. Each had to be handled ingeniously.

The Corps was given a few additional jobs to do while it was working:

Not all of the Army Engineers' efforts were limited to the recovery of the stricken area. Important preventive studies were being conducted at the same time — studies that had to be made at the site as soon after the disaster as possible. In addition to estimating the damage that had occurred, the exact boundaries of the flooded area had to be determined in order to know explicitly how the waters behaved, thereby increasing the store of knowledge about flood control that had been accumulating over the years.

The dams above the flooded areas were inspected. One flood control dam, for example, which is still under construction near Huntingdon, Pa., held back enough water to save an estimated $59.9 million additional damage at Harrisburg alone. The cost of the completed dam will be about $69.9 million.

If more flood control dams like that had been built. . . .

Could it Happen Again?

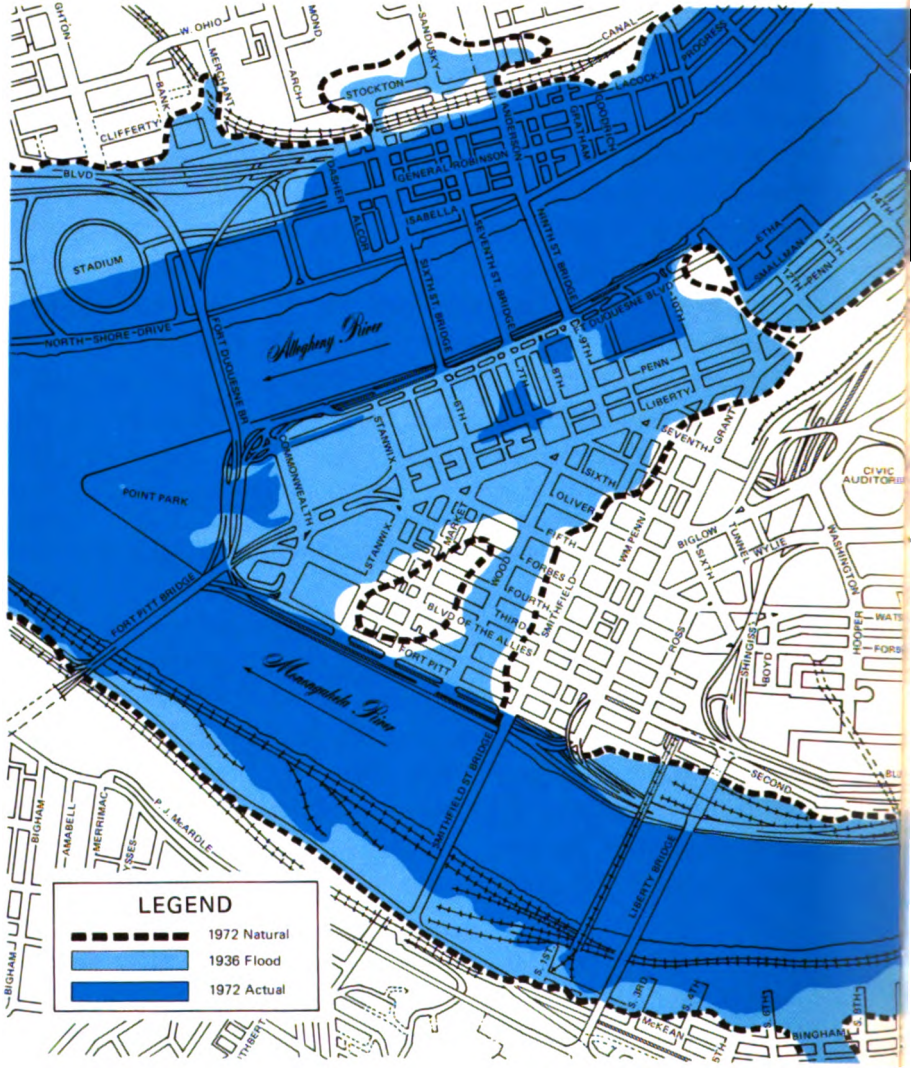
Yes, it could happen again.

Could it be prevented from happening again?

Yes, it could be prevented from happening again. In fact, there is great hope that a flood of Agnes' magnitude will not happen again, but only if we can use the knowledge that we now have in controlling the flow of our nation's rivers and streams, have the means with which to do it, and the time. The effort would have to be massive and involve the selfless backing of everyone, including people who have never been directly affected by a flood or may never even have seen the results of one.

Pittsburgh is a spectacular example of what can be done to protect a flood-prone city. In the destructive Ohio River flood of 1936 most of the downtown section of the city was under water. Damage was estimated to be $94 million (1972 equivalent about $411 million) and 250 people were killed. Pittsburgh is at the confluence of the Allegheny and Monongahela Rivers where they join to form the Ohio, one of the largest tributaries of the Mississippi. After the flood of 1936 the Corps of Engineers was directed to protect the city from a repetition of that tragedy. Flood control work had been going on for years in the Mississippi River Basin, but the flood emphasized the need to divert time and effort to the Pittsburgh area. The money was made available and the Engineers went to work. The results of their projects were more than satisfactory. Pittsburgh provided the hope to every flood-susceptible area in the country that it, too, could be spared the devastation caused by storms that are followed by the rush of uncontrolled waters.

Agnes poured more water on the land drained by the Allegheny and Monongahela Rivers than the rains and melting snows of



Flood control work prompted by the disastrous flood in 1936, saved Pittsburgh from utter disaster. If the dams had not been built, water in the Golden Triangle would have been two feet deeper than in 1936.

1936; in 1972 Pittsburgh was only mildly affected. Work is still going on in that watershed and plans are on file for a few final projects. If the money had been available and everything had been completed, there might not have been even the minimal damage that Agnes caused. As one Pittsburgh resident who had survived the 1936 flood said, "Most of us slept right through Agnes."

Flood *prevention* is quite different from flood *control* and can be achieved only by an elaborate program of water management. Planning and managing a watershed of any area is costly and time-consuming. There is far more to it than erecting huge spectacular dams which hold back the floodwaters until they can be safely released, or building dikes and levees to contain the high level of the river when it crests.

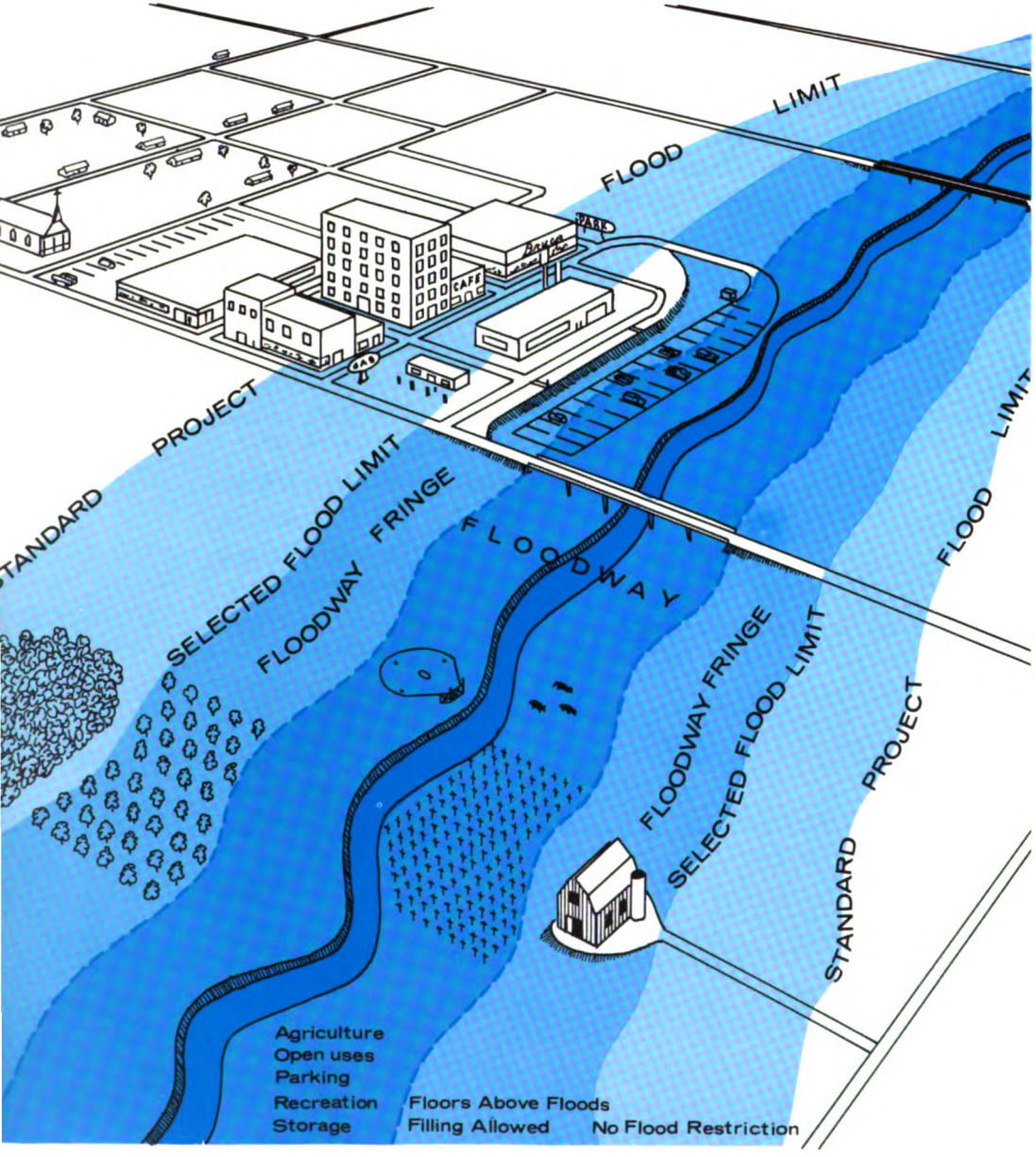
Sometime in the far-off future, storms like Agnes may be controlled or dissipated before they reach land and destroy it. Weather modification of that magnitude is, unfortunately, now an improbable dream. We have to deal with the possible and do what we know we can with today's advanced technology.

In order to prevent a flood it is first necessary to seek out the source. In any river system this means starting to control the flow of water before the small tributaries start to burgeon and overflow. Planting water-absorbing vegetation and building small dams upstream to hold the water will often keep it from rushing down the brooks and creeks to join the river as a flash flood. By using these simple devices the water can be absorbed into the water table or released slowly at a rate no greater than the larger river can contain it. A heavier rain requires a different technique. As we move down the river the quantity of water increases and the measures that must be taken to control this larger amount of water must be greater.

There are many ways of managing a river and the methods used depend on the topography, the geological composition and structure of the land the river flows through, and how the river is normally used. Is the river used for irrigation of agricultural lands? Is it used for transportation? Is it used as a source of power? Is it the water supply for large cities or smaller villages? Is it used for recreation? Is it used for all these things? Are there long reaches where it isn't used for much of anything? Those are some of the basic questions that must be analyzed and provided for before any planning for water management can be done.

When a flood prevention project is planned our nation's natural and economic wealth must not be damaged in the process. The river, in fact, is made more valuable to us and to nature's balance when a water management program is skillfully planned.

Let's talk about a river that can have many uses when it is made to behave itself. It's a "flashy" river, that is, one that behaves erratically. It reacts quickly to a heavy rain with high, fast-flowing water and is reduced to a mere trickle during a dry season. If it's a good-sized body of water it can be changed from this to a fairly



steady-flowing and useful river by withholding the excess water and releasing it when it is needed. By managing it this way, it becomes a reliable source of water for urban and rural use; it may even open up an economically depressed area to commerce. Dams are built and the water is retained in reservoirs as a constant supply for the cities and towns downriver. Whenever possible, the lands around these man-made lakes are developed as public recreation areas for swimming, boating, camping, and other outdoor activities.

Dams are not the only means of achieving flood control. Flood plains zoning may also be established. Flood plains are lowlands reserved for high river flows. Often local zoning laws regulate construction in the flood plains, thereby reducing the potential of future flood damage. Although they should not be inhabited, the rich and fertile soil makes them valuable farmlands. Parks and recreational areas can also be located in these plains. It is easy enough to say that people should not live in a flood plain, but under our form of government we don't just push people around because the Government says it's the thing to do. Neither Federal, State, or local governments like to tell homeowners to pack up and move out of their family fields and property because it will be flooded every few years just the way it was when grandpa ran the farm. There are solutions, although they are not easy to put into effect. State and local governments might make it financially worthwhile for people to move their buildings to higher ground and still permit them to farm the rich lands in the flood plains. We can conduct intensive educational programs to emphasize the dangers of remaining in the places that are subject to flooding. Perhaps tax advantages could be arranged to encourage them to move.

Flood plains and dams are sometimes augmented by aquifers which are natural subterranean beds of gravel or permeable earth

where the water is stored by nature and released as groundwater to the surrounding area. If a flood plain happens to have an aquifer under it, the arrangement is ideal.

The flow of water can also be controlled by planting various types of vegetation along the banks to act as a brake against the rushing water and, at the same time, protect the bank and keep it from eroding. A side advantage is that vegetation provides a natural antipollution mechanism that converts carbon dioxide into life-preserving oxygen.

If a river is, or can be, used for commerce, dams and locks may be built so that inexpensive transportation of goods and material is available to the valley. The dams are frequently excellent sources of cheap electrical power, which is the cleanest method of generating electricity yet devised.

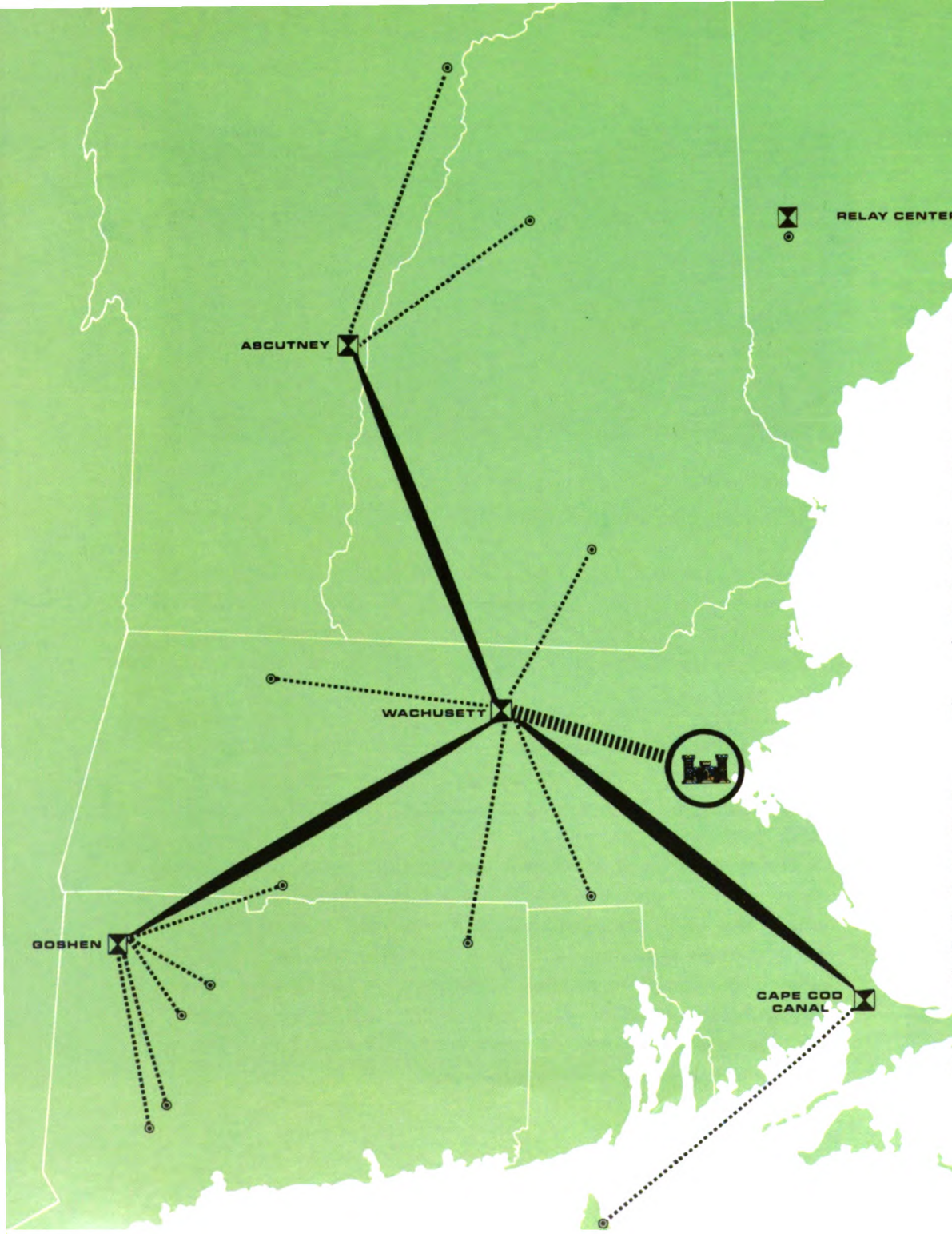
River flow is predictable. You have probably seen little square boxes along the banks of rivers. They are probably water gages which are checked regularly to see how high the water is and what the volume and speed is. That slow and often unreliable method of prediction has been improved on over the years and now the Corps of Engineers has developed complicated and highly accurate ways

of determining what the river is doing and what it will do in any particular place. But even present methods are being constantly improved.

One of the most imaginative and successful systems of water management is a pilot program started by the Army Corps of Engineers in 1970 with the Automatic Hydrologic Reporting Network in New England.

The Corps installed a radio-operated, computerized network where reports are made from 41 unmanned stations located at strategic river-basin and shore locations from northern Vermont to Block Island and from the Cape Cod Canal to the border of New York State.

The stations, most of them in remote spots, report the level of rivers, rainfall, and tidal elevations to a centralized computer where the data are compared with information received from other stations and analyzed. Flood gates are then directed to be opened or closed as needed. They may be closed to hold an overabundance of river water that might cause flooding, or they may be opened to provide more water to downstream points where the supply has become insufficient.



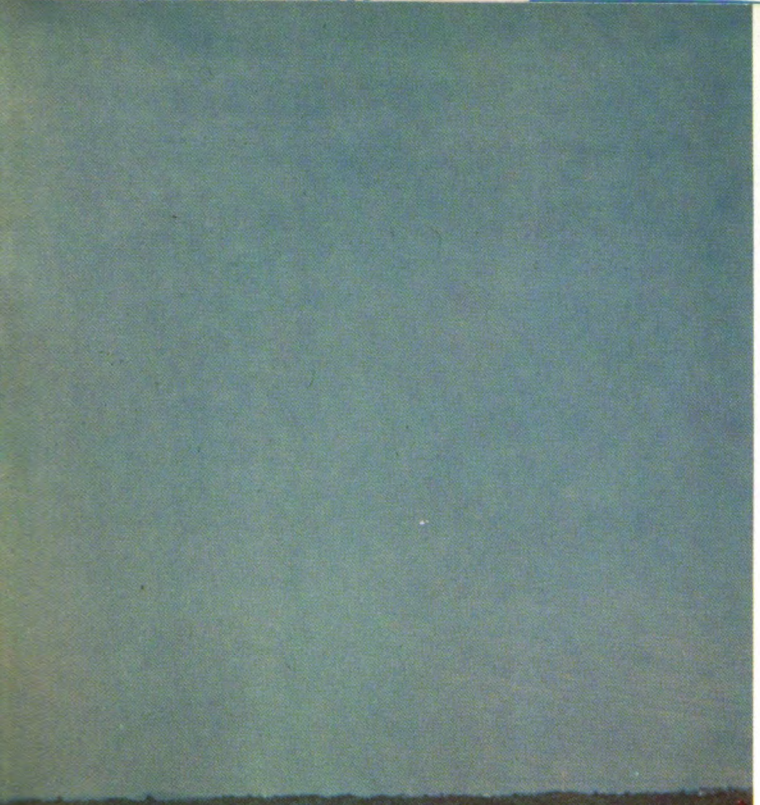
The 41 stations are in constant operation. The train of events can be completed in three minutes: the automatic reaction at some far-off river site, its radio transmission to a repeater station, information gathered and forwarded to a relay station, full information transmitted to the computer at the New England Division's Headquarters in Massachusetts, a computerized analysis of all the information from many stations in the general area, an electronic determination of which dams should adjust the flow of water and how much, and the information sent to the field personnel who operate the dams. The individual stations are battery-operated so that, in case of a power failure, the system will continue to work. The New England system, in addition to its flood control role, is also used to inform the Corps of Engineers when hurricane protection measures should be taken.

Sometimes well-intentioned but misinformed people object to water management because it interferes with nature's plans.

Agnes brings to mind the alternative.

Carefully planned water management preserves our natural resources and helps us to use our land without destroying it. Building a dam without planning it as part of an overall watershed project may do ecological damage that is almost impossible to correct. Each dam, each man-made lake, each flood plain must be a coordinated part of a master plan. Many private and industrial dams built in the past have been inadequately constructed and their placement has been harmful to effective management programs.

An outstanding example of the need for water management was the effect of uncontrolled waters of Agnes on Chesapeake Bay.




U.S. ARMY
EMERGENCY
OPERATIONS
CORPS OF ENGINEERS

Chesapeake Bay is a giant estuary and the balance of any estuary is delicate. An overabundance of nutrients in the waters leading into the bay encourages the growth of algae which use up the oxygen. It follows that there is then less oxygen to support the fish, clams, and oysters that are the economic lifeblood of many people who live by the bay. So much effluent, debris, and other foreign matter poured down the rivers that the bay received about a three-year load of nutrients.

Even more importantly, Agnes put too much fresh water into the Chesapeake Bay in one gigantic rush. The salinity of the bay, as in all estuaries, varies from winter to summer and from the surface to the deeper parts. The animal and plant organisms have adjusted to these changes, but many are unable to survive if the change of salt content is drastic. The billions of gallons of fresh water pouring into the bay during Agnes killed many organisms that must have a certain amount of salt to survive. If the flow of water had been controlled, this drastic change would not have been devastating to the marine life. Life, formerly so abundant in Chesapeake Bay, has been adversely affected.

Many watermen who have made their living gathering oysters and clams were unable to stay in business. The natural wildlife of the estuaries has changed because many of the living links in the food chain have disappeared.

The ecological disaster was caused by nature, not by man. At some future time the water management programs that are now planned will have been completed and the Chesapeake Bay will be able to withstand the onslaughts of nature without having either the ecological or the economic balance upset. There must be mutual planning between the ecologists who are interested in the preservation and conservation of the ecosystem and the people who want to survive.

Let's summarize what *didn't* happen in 1972. The greatest flood that Pittsburgh ever had would have occurred – but it didn't. Outside of the eastern seaboard the Missouri River would have had its most devastating flood – but it didn't. The Columbia River would also have had its greatest flood – but it didn't. Why? Because flood control measures were working. The water was stored upstream and released at sensible rates. Little damage was done.

The worst damage Agnes wrought was at Wilkes-Barre, although it was equally horrifying throughout the flooded area. Four major water storage projects to protect Wilkes-Barre were completed – fourteen have been planned. If the entire system had been completed, as planned, the story of Agnes at Wilkes-Barre would have been different.

Not too many years from now, if the water management projects are completed, a storm like Agnes should have little effect.

And then there will be no "story of Agnes."

D EDITION

Sunbury, Pennsylvania, Sunday, June 25, 1972

PRICE: 15 Cents

len Susquehanna River Falling,
Reach Its Natural Banks Monday

By JOHN MOORE
Staff Writer

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rgency broadcasts during Great '72 Flood

THE OBSERVER

MASSIVE FLOOD CLEAN UP ETS UNDERWAY IN VALLEY

dle' Rea, Derick Building

The Patriot
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$50 Million Aske
For Floo

House Panel Approves
$200 Million Flood Aid

More in Disaster

Sunday Wisconsin State Journal 30¢

WEATHER:

Mostly Sunny, Pleasant Today. High in Upper 70s. Low Tonight in Low 50s.

MADISON, SUNDAY, JUNE 25, 1972

Flood Death Toll Climbs to 11

President Tour
Disaster Areas

Army Engineers
To Aid Tioga
Disaster Areas

Disaster aid on way here

Laurenceville Scene:
Hope Remains in Devastati

Flood Jars Tax Base; Sub

Food Stamps Valued At $644,486
Given 45,645 Victims Of Flood

HOUSING PACT Ev
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AT NANTICOKE

Nesbitt Will Reopen
By The End Of July

West Side Carriers
Of TLEN and Record
Asked To Respond

Elmira Schools Damage: $5.2 Million

Columbians unite to aid flood victims

THE NEWS Columbia

A section of THE NEWS.
Howard County's award winning newspaper

SECTION A

THURSDAY, JUNE 29,

Topeka Sunday Capital-Journal

94 Pages 25 Cents

Topeka, Kansas, Sunday, June 25, 1972

Flood Threat Spreads

Crests Move
Downstream
To New Areas

Forewarned
Allies Repel
Red Assaults

The Susquehanna Stretched Its Watery Fingers

Automation
Is Slowed,
Not Stopped

Agnes Had
Us Fooled

By CAL TURNER
Staff Writer

Disaster '72:
The Flood in York County

SUPPLEMENT TO THE DAILY RECO

Red Cross Disa
Bulk Food Dist

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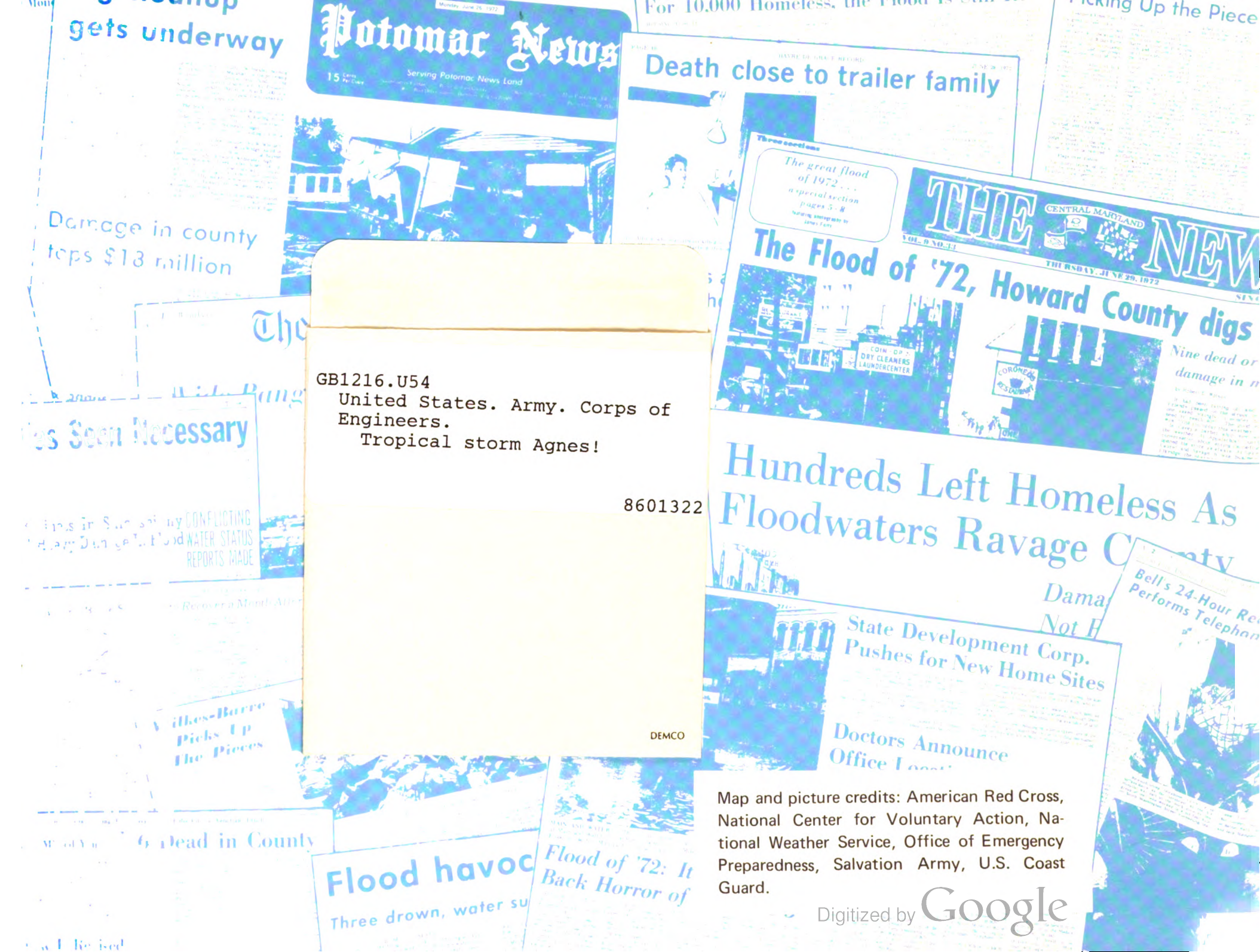

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UNITED STATES ARMY CORPS OF ENGINEERS