

Plan or Perish?

By J. RUSSELL SMITH

A DOG'S house is his castle," said the judge as he dismissed the case and thereby gave a fine example of the American spirit of liberty. It seems that while drunk a man had crawled into a dog-house. The dog bit him. The sufferer sued the dog's owner for damages. The court ruled that the dog was within his rights, for the house of even a dog is his castle in this land of liberty.

We all want to be free. The desire is as natural as breath. But also we want a lot of things that we can get only by subjecting ourselves to control, to cooperation, and to team-work.

The Mississippi River breaks out. Is this a problem in liberty or of team-work? This river drains parts of thirty-one states and a bit of Canada. Millions of people live on the hundreds of thousands of square miles which it drains. The river has recently brushed aside most of our attempts at control. It has demolished several hundred million dollars' worth of property, drowned over one hundred people and driven 600,000 others out of their homes. The spirit of liberty which we all love must step aside. The river forces us to a stern task of control, cooperation, and team-work.

This is really a declaration of war by the river. Will we run or will we fight? We think we will fight, but it is a nation-sized job. The river is always there and may attack any time. If we cannot plan better for the Mississippi in the future than we have in the past, we should abandon the 29,000 square miles of flood-land and let it revert to a per-

manent reserve for mosquitoes, bullfrogs, muskrats and swamp forest trees, although with well-planned care it can become by far the richest block in all American agriculture.

How came this flood? To begin with, we cut the forests from the watersheds. At that time timber was so cheap that a lumberman could not afford to protect it from fire after he had cut the timber. He had to make a profit, so he moved on to a fresh tract. The fire followed the lumberman.

Almost before we knew what was happening, we found that we had eighty million acres of might-be timber-land quite unproductive because of repeated fires which kill off the little trees, burn the leaves, trash and the soft spongy soil that theretofore absorbed the rainfall and helped to prevent floods. This is particularly true of the mountain lands of Pennsylvania and West Virginia, which furnish water for the Ohio River floods, contributing to the Mississippi floods. In a period of freedom for the individual and abundance of natural resources, we have let anyone who wished cut the forest from the hill-lands, plow the hills, and let them wash away in gullies. Think what that means!

ANY person at all who can get permanent or temporary possession of a farm is free to ruin it. In the era without plan, farms have been made on land that should have remained in forest. The farmer had to eat, so, in a few years, he has often ruined land that with care would feed a person or a family for generations, for centuries—for ages to come. Thus by plowing land that should not have been plowed, we have ruined the future food supply of millions. This gulying is ruin on the spot and ruin down

below, for it increases the rate of rainfall run-off (floods), and it also has sent billions of tons of sand and earth to choke the river channels, thereby limiting their power to carry off floods.

How came this flood? Chiefly, it rained. It rained a lot. It rained a most unusual lot. We had no comprehensive plan for letting the water run away safely. Therefore, we got drowned, in person and in pocket, in mule and in crop.

A plan for a river must meet all emergencies, and the emergencies of the river are made by the weather. Now the weather shuffles and deals us a curious and complicated pack of cards. I read recently that a certain hand in bridge will come on the average only



Photo by J. C. Bragdon

Federal Street, Pittsburgh, under water in March, 1907. Pittsburgh has a flood-control plan which will dovetail into any adequate general plan for the Mississippi and its tributaries. Meantime, it waits—and risks another flooding.

once in some million deals. It is almost that way with the weather. One of the greatest students of erosion has said that one rain of each year does as much damage as all the other rains of the year; that one rain of each decade does as much damage as all the other rains of a decade; and that it is probable that one rain of each century does as much damage as all the other rains of the century. Therefore, a safe and comprehensive plan for flood control must be able to take care of emergency conditions. If we live beside a river, we must plan for that or take a drowning when it comes. For example, the greatest floods of record at St. Louis, Mo., were in 1796 and in 1844.

We have no comprehensive plan for the Mississippi. For proof, see the Pittsburgh case. In 1907 the people of Pittsburgh got scared. They had reason to be, for in that year came the worst flood in their history and the record showed that the floods were coming with greater frequency, and higher. To push the alarm home, they had the chilling fact that this record flood of 1907 was produced chiefly by one of the two rivers that join at Pittsburgh. Some day Nature would so deal out her cards that both rivers would flood at once. What would happen then? Well, that is what scared Pittsburgh.

Pittsburgh raised some money for a survey and a plan. The engineers brought in a plan and recommended a lot of reservoirs in the mountain valleys upstream. These reservoirs would hold enough water to take most of the damage out of the flood. When the water in the rivers got low, the release from the reservoirs would be of great value to water supply and water power and to navigation. It would help the people of many cities and states along the Ohio-Mississippi system.

At this point the people of Pittsburgh discovered that their plan was in reality only a part of what should be a much larger plan. Being Scotch, they asked themselves why they should spend millions for the benefit of the whole fifteen hundred miles of river and the people thereon. They not unnaturally decided to wait. Instead of going to work, they joined interests with New Orleans in an educational campaign to make a plan for the entire river. This was financially wise, although Pittsburgh risks a fearful flooding while she waits.

WE have no comprehensive plan for the Mississippi River. For proof, see the chaos on the lower river. By the natural process of dealing with problems where they arose, we have organized many independent enterprises each dealing with a part of the river system. The lower Mississippi is in charge of the Mississippi River Commission. This Commission, created by Congress, has control of the Mississippi and its branches as far as a Mississippi flood backs water up these rivers. The tributaries, Red, Arkansas, Black, St. Francis and others, flow across the flood plain, and bring floods to the Mississippi. These tributaries can flood a section of the plain quite as effectually as the main river can do it. On the various streams a group of citizens of Arkansas or Mississippi or Louisiana can get together and, according to state law, form a drainage district and erect levees to suit their own ideas—a chaos of plans which have

failed, thereby showing us that we must have one plan.

In the absence of a comprehensive plan, the dominating motive in flood work on the lower Mississippi has been to "crowd the water out of our neighborhood." This usually had to mean also to "get it onto somebody else." Does anyone think there was general mourning in New Orleans late in May when the Bayou des Glaisses, near the mouth of the Red River, broke and flooded the Sugar Bowl of Louisiana? How could they mourn? There was a veritable inland sea above the Red River levee. Water was piling into it apparently twice as fast, probably more than twice as fast, as it could flow past New Orleans. A two-foot rise at New Orleans would have flooded that city and turned it into a death-trap. No, New Orleans could not and did not mourn. She sighed a sigh of relief and the next day the river began to fall at New Orleans. The flood had flowed over someone else. New Orleans was saved.

This policy of crowding the flood onto someone else has

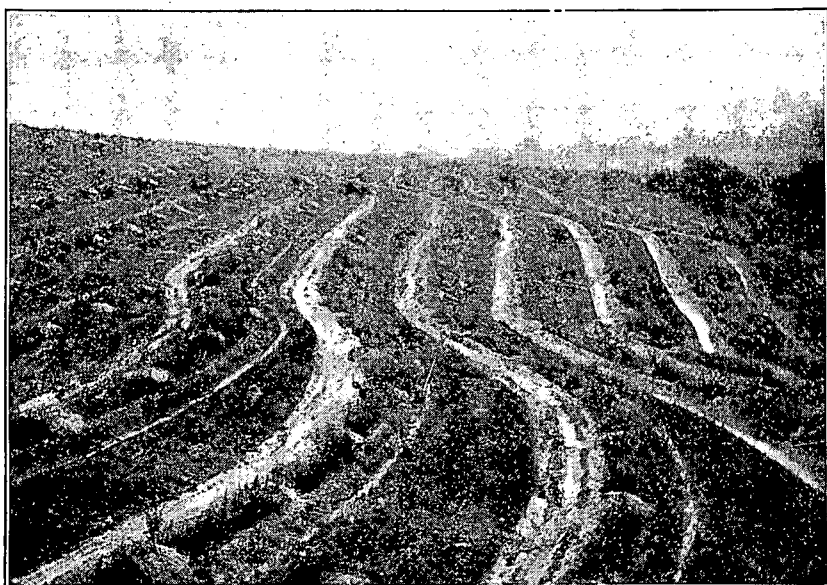


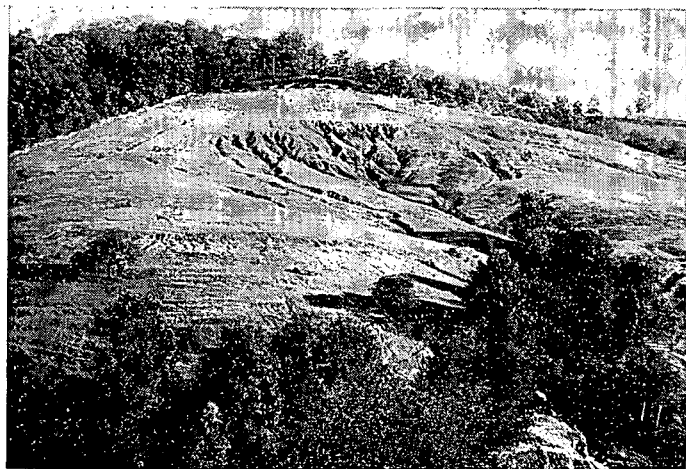
Photo by Lawrence Lee

One of the great agricultural inventions—horizontal terraces holding water on the Piedmont hills of Virginia. Rain soaks slowly into the terraces within ten feet of where it falls. This makes trees grow rapidly, saves the soil and holds back water which would otherwise run off to make floods

even gone so far that it has been reported that the people on one side of the river, bank A, have tried to dynamite the levee on the other side, bank B, so that the A-bankers would escape the flood which they thought had to overtop one bank or the other. But these people were laboring under the excitement of a menacing calamity. There was a dead-fall of water up there in the river ready to rush down on their homes.

One of the inherent troubles of the situation is the conflict of local interests with general interest. A law of Congress concerning the Mississippi River illustrates the point. When the river gets in flood it breaks the levees from time to time; spills itself over the lowlands and works its way down to the Gulf. Hence the demand for prepared spillways and floodways to take care of the surplus waters without destruction. It goes without argument that the facts of river location, the elevations and the shape of the land, decide where these spillways should be.

A glance at the map shows Lake Pontchartrain reaching



Courtesy Ohio Agricultural Experiment Station

Erosion in Washington County, Ohio, part of the Mississippi Basin. Water has run off rapidly and carried the soil with it

far inland toward the left bank of the Mississippi River above New Orleans. It looks as though it might be a natural place to receive a spillway or two. But it so happens that Lake Pontchartrain would pour these muddy waters into Mississippi Sound, along the south shore of the state of Mississippi. Therefore, the state of Mississippi becomes active in Congress with the result that a law forbids the Mississippi River Commission to even survey for spillways that would pour water into Mississippi Sound. Fortunately, since the present disaster, a senator from Mississippi is now ready to sacrifice the small interest of Mississippi (and it is a sacrifice) in the interest of the larger good. He has recommended the repeal of this prohibition. The fact that we have had and still have this law, may serve as a crowning proof of our utter lack of comprehensive planning by which to accomplish one of the most difficult tasks that man has ever attempted.

What do we need? (We have a group of economic inter-

ests of great importance and of varying degrees of urgency, but all contributing to or connected with the problems of the flood prevention on the lower Mississippi):

1. Protect the 29,000 square miles of alluvial land on the Lower Mississippi from flood, if it is worth protecting now at the necessary cost
2. Protect New Orleans from flood
3. Protect Pittsburgh and Ohio River cities from flood
4. Maintain and improve navigation
5. Reforest mountain lands on headwater rivers
6. Create new waterpower resources by reforesting and building reservoirs
7. Create a new type of hill farming to prevent quick run-off and gullying
8. Fertilize the Mississippi flood plain land with flood mud and make of it another Nile Valley, yielding perpetual harvests.

Those are eight wonders. The value of each runs from hundreds of millions to billions. Integrating them into one comprehensive plan is a task involving control, team-work and plan, and it must have many points of contact with political action. Have we the men with minds competent to handle these elements, integrate them into a whole and execute it with reasonable cost? If we have such brains at our disposal, can politics find these brains, and then can politics let these constructive brains alone while they work? Or will there be more acts of Congress like the one about Mississippi Sound, with senators log-rolling and killing appropriation bills because their corner of one of the thirty-one states drained in whole or in part by the Mississippi is not pleased by something that must be done in the interest of the greater good? Be not harsh on the senator. We, the voters, make him do these foolish things. We could have much better government if we did not make the officials play politics instead of punishing them for it.

We have plenty of technical skill and wealth to tame the Mississippi if it is worth it. The chief stumbling blocks will be found in human nature.

These eight problems of the Mississippi fall into two groups: 1, protective; 2, preventive and restorative. The protective problems are urgent. People must be saved from flood. There is no time to wait. The next flood should find Pittsburgh, New Orleans and the Mississippi flood plain so fixed that the flood reaches the sea without serious harm to man or his works.

Protective works should be put through as quickly as a plan aided by steam and electricity can do it.

THE preventive and restorative problems are not so urgent. They can be distributed over a period of years. Let us first consider the less urgent, the preventive and restorative ones. These are chiefly concerned with checking the swift run-off.

We need reforestation. Millions of acres of hill and mountain land in Mississippi drainage are almost or quite unproductive and lack the leaf mould of the forest floor. This condition prevails because fires have repeatedly swept over the area. We are using timber four times as fast as it is being grown. A timber famine looms



Courtesy Pennsylvania Dept. of Forests and Waters

An over-grazed hillside in Parke County, Indiana, tramped by stock from the adjoining barn-lot. The trees will die, but the roots show how they hold the earth if given a chance

in America. For timber alone, therefore, we should reforest large areas of gutted Appalachian upland. There is not space to explain it here, but individuals with small mountain tracts of timber-land are almost helpless in the face of fire, the great enemy of the forest in America.

IN Sweden or Norway, France or Germany, Switzerland or Austria, large blocks of such upland are in forest, perfectly cared for and owned by the state. It is time that we started a vigorous policy of reforesting and fire protection in the East. We need it for the forest; it will contribute to flood prevention, to the improvement of navigation, of water supply and of water power. It should be added that reforesting will be more important relatively to Pittsburgh than to New Orleans.

We need waterpockets on our watersheds. If you make in the ground a hole, or a furrow, or a basin, so shaped that the water cannot run out of it, it may fill up with water during a heavy rain. The water gradually soaks into the ground and waters the trees or other plants within its reach. Waterpockets help to stop erosion and to feed springs. The waterpocket has been used chiefly as an agricultural device. I have seen it in China, in the Malay peninsula, in Algeria, in Porto Rico, in Minnesota, in Pennsylvania and in Virginia. In each of these places it was an independent invention to promote the growth of field crops (China), rubber trees (Malaya), olive trees (Algeria), coffee trees (Porto Rico), grape vines (Minnesota), or apple trees (Pennsylvania and Virginia). The Virginia inventor assures me that his waterpocket land has had no run-off for years. The inventor, Mr. Lee, is an engineer.

Much more significant is the rather extensive use of a similar device by a power company in North Carolina. The company wants its water-wheels to run. To do this the stream must run. To maintain stream-flow this company catches the rain water in hundreds of little tractor-made trench-reservoirs on the hillside, called "terrace with back ditch." These terraces hold the water until it soaks into the earth to flow out later as spring water. It also makes trees grow faster.

This field water storage is one of the great inventions. Suppose they caught a third or a half of the run-off of Appalachia within ten yards of the place where it fell and made it soak into the ground. See how this would stop floods, increase water-power and increase tree growth. Pittsburgh should take notice. Why let North Carolina get ahead? And North Carolina was not trying to save a city from destruction either.

We need a tree crop agriculture for the hill country. In different sections of southern Europe I have seen hill-sides covered with crop yielding trees—olive (butter substitute), English walnut (meat substitute), chestnut (wheat and corn substitute), acorn yielding oak (corn substitute), carob bean (bean substitute). These hill-sides were not plowed and the tree



Photo by Alfred Gaskill, courtesy U. S. Forest Service

A model spruce wood at Siegsdorf, Germany. Reforesting not only grows timber—it saves soil and holds back water

roots and grass held the soil in place. In America, lacking such crops, we have plowed hillside to put in corn, cotton and tobacco. These crops favor erosion greatly and the hill-sides have washed away, making a terrible destruction of resources and adding to the total volume of floods a double contribution of water and mud.

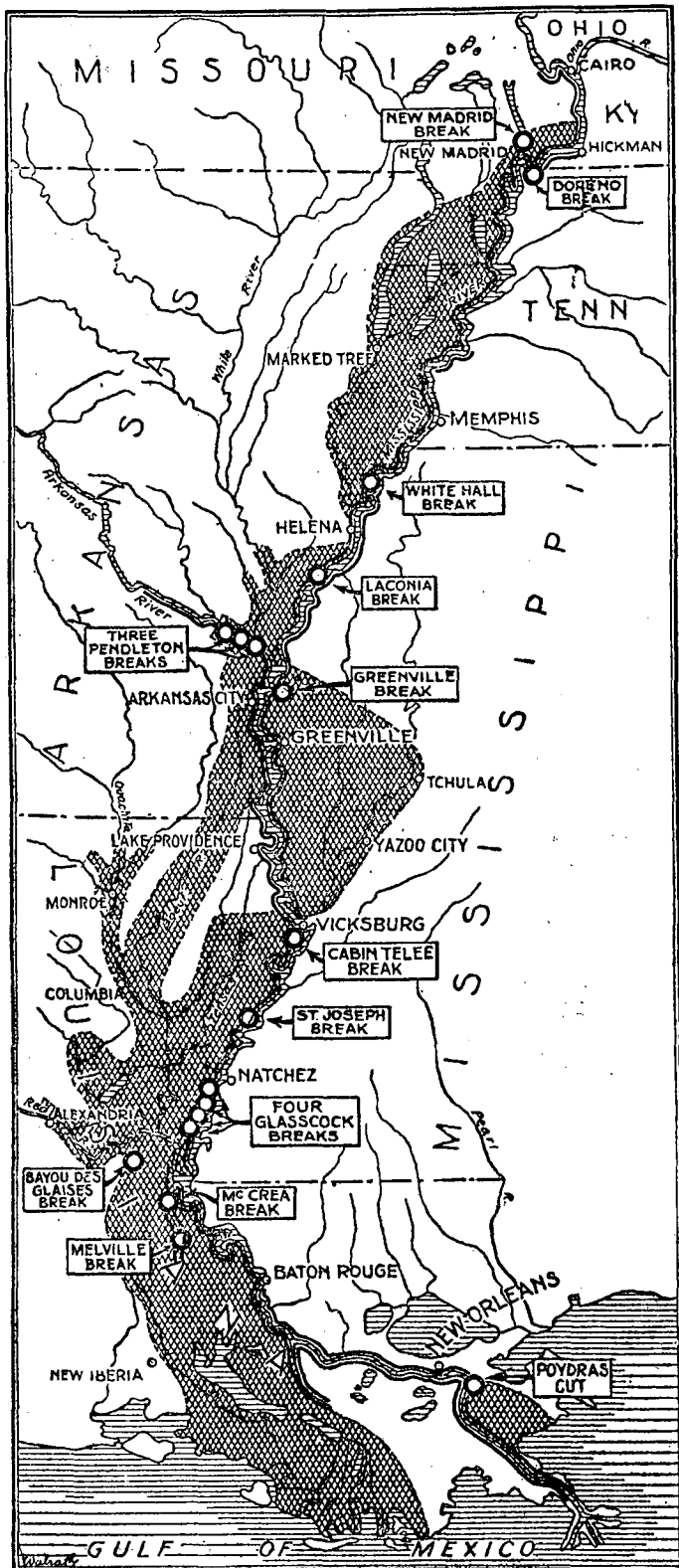
Meanwhile our native trees are amazingly rich in crop possibilities. Walnut, hickory, pecan, persimmon (pig feed), honey locust bean (bran substitute), oak tree (corn substitute), and many others. The secretary of agriculture has and can get men who would like to make these trees into annual crop producers, but he has not the appropriations. That is because we who appropriate have not yet got the idea that we should plan to do constructive work for the future. The Department of Agriculture, therefore, is busy with problems of the day. We will not permit it to plan great projects.

We need spillways and floodways to save the farms and



Photo by E. A. Sterling, courtesy U. S. Forest Service

Small-strip method of cutting mature forest in Urwald, Germany. In Austria, France, Switzerland, Norway, Sweden, Germany, government forests are protected from fire, against which the individual owner of forest land in the United States is helpless



Courtesy of New York Times

Spillways? Yes the Mississippi has seventeen of them now—wild ones, all but Poydras, and it is half wild. The river always has had spillways and it always will have them. The shaded area, the 18,000 square miles flooded this year, should be called "part of the natural bed of the Mississippi river in flood time." Therefore the levee along the Red River became a kind of unbelievable attempt to dam the Mississippi. It is unbelievable, yet it was built. It is unbelievable because it dammed up water for which no outlet was provided. This sounds like Alice in Wonderland, this dam of the Alice engineers.

cities of the lower Mississippi. It is well to work with nature rather than against her. We have been fighting the river rather than cooperating with it. Hence the calamity of 1927. The Mississippi River flows through a flood plain from Cairo, at the mouth of the Ohio, to the Gulf of Mexico. The river built this flood plain by filling an ancient sea. In nature, the river floods thousands of square miles of this flat land at every overflow. As the water swings out of the main channel into the still backwaters, its speed is checked. It drops part of its load of silt and mud. This makes the river bank higher than the back swamp. (See the picture on pages 376 and 377.)

A river in a flood plain has another habit that is appalling to men. It is very crooked, and therefore it is always cutting the outer bank of the bends. As a result of these two habits of bank-building and bank-cutting, the river is continually relocating itself. After any overflow, we may expect to find a flood-plain river flowing in some new course out in the back swamp which is lower than the banks of the old stream.

A third conspicuous habit of the flood-plain river is a natural result of the first two. Water breaks out of the main river and flows to the sea by separate channels, giving the river many mouths. The Mississippi has done this for ages.

We build levees to keep the water off the land. This narrows the channel. This piles water up higher in the main river. This increases the speed and the cutting power and the danger of breaking through the outer sides of bends. Then we have made it worse by increasing run-off by deforesting and bad hillside farming. For result see our endless series of floods with their crevasses and drownings. Especially see the flood of 1927.

In the Sacramento Valley of California they have been through all this experience and have gone on to the next step. They are cooperating with the river. They have built a set of levees which make a reserve channel or flood-way. It is a kind of second river to take the surplus when the first river gets full to safe capacity. One or more reserve channels are absolutely vital to the Mississippi for much of the distance between Cairo and the Gulf. The following facts should serve to convince the most skeptical.

A. The Mississippi River near New Orleans has a channel built by nature to carry a minor fraction of the river in flood. Most of the flood water was, in nature, flowing through the swamps into which the river had been discharg-



Courtesy of the War Department

Railway between Memphis and Vicksburg, 3 feet under water

ing water for a thousand miles. B. We have built a system of levees which artificially raise the safe level of the river at New Orleans to twenty feet above mean low water. C. This enlarged river carries less than one-half as much water at New Orleans as the Ohio and the upper Mississippi and its tributaries were pouring into the stream in May. It carried only a half of the flood of 1882. Enlarging the lower Mississippi to make it carry two and a half or three times as much water as it now does is an unthinkable task. It is also an unthinkable menace to farm and town alike. The idea is enough to be a real nightmare to the people of New Orleans. No wonder some people say they are crazy about spillways. Why not say they are sane about spillways?

It should also seem too clear for argument that these spillways should not be gates to get out of order, but structures that would handle a flood automatically if the whole population had gone to Europe.

The present system is one of repeatedly uncontrolled breaks and uncontrolled flood. The spillway and floodway idea would put a safety valve on one and a fence (the levee) around the other. That is cooperating with nature.

We need to fertilize the Mississippi flood plain with flood mud. The Mississippi flood plain is rich with river mud, because the levees break and we have floods so often. If we should really succeed with the flood prevention on present lines, the land would soon become impoverished. By flooding it under control at proper intervals, it can be made to yield a five-hundred-pound bale of cotton to the acre. The national average is one hundred and forty-three pounds. The difference of three hundred and fifty-seven pounds looks like an annual acre profit to result from using the flood. Crops of corn and hay would be increased proportionally. Flood mud on 20,000 square miles of flood plain might, if the land were cultivated, easily be worth several hundred million dollars per year. This is a simple but big task of engineering plus constructive imagination.

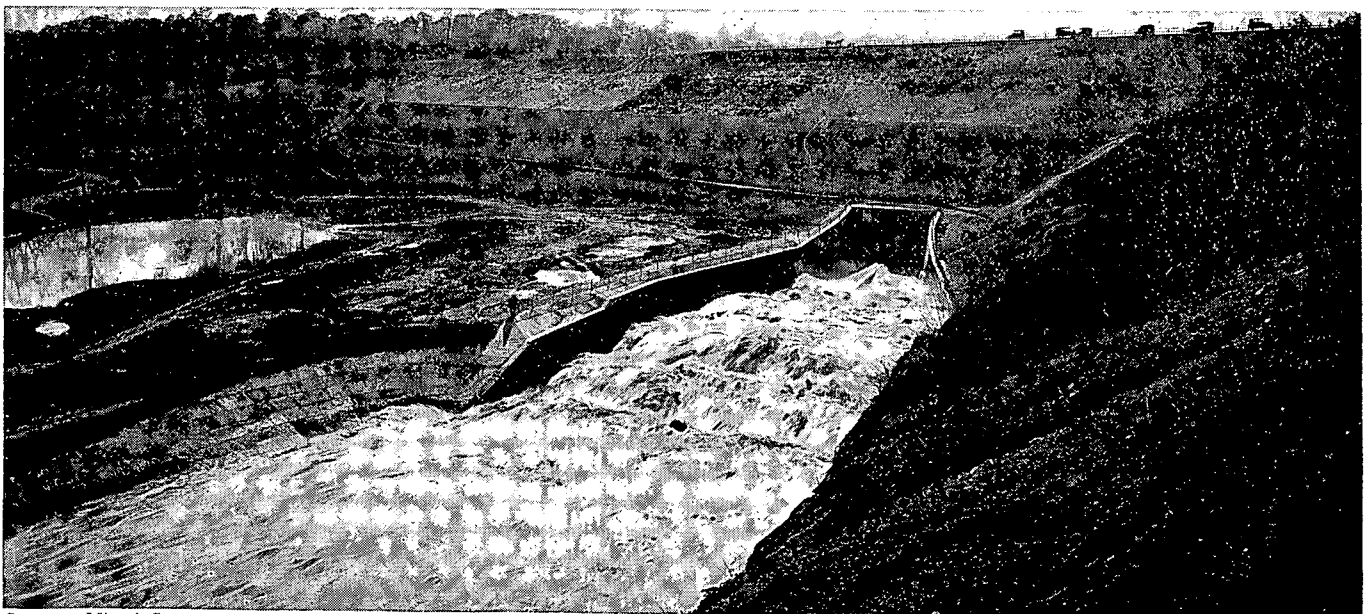
The whole problem needs to be examined from the beginning as though it were a new thing. At present it is chiefly in the hands of the army engineers, as prescribed



Donahy in the Cleveland Plain Dealer

Still Afloat!

by Congress in the act creating the Mississippi River Commission. Flood control is a technical, economic task, of far-reaching industrial significance. What is the best type of man in America to do this work? Is it the man who elects war for his profession? This choice indicates his fundamental interest. He goes to a war college, studies the art of war, becomes a part of a military machine. He



Courtesy Miami Conservancy District

A dam at Germantown, Ohio, at work checking a flood, with thirty-seven feet of water piled up behind it. There is a spillway a quarter mile away. It may not be used for a century, but it is there, ready for an emergency.



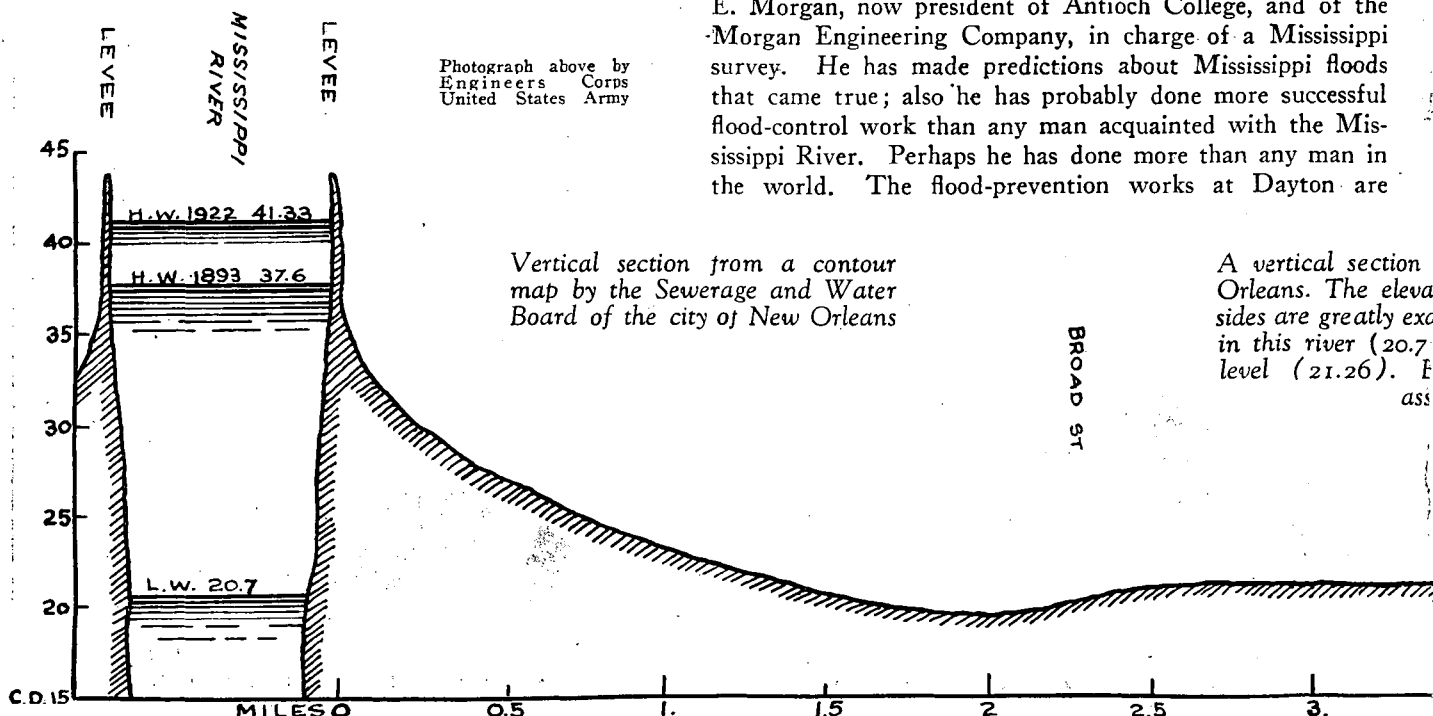
HOW THE BOTTOM

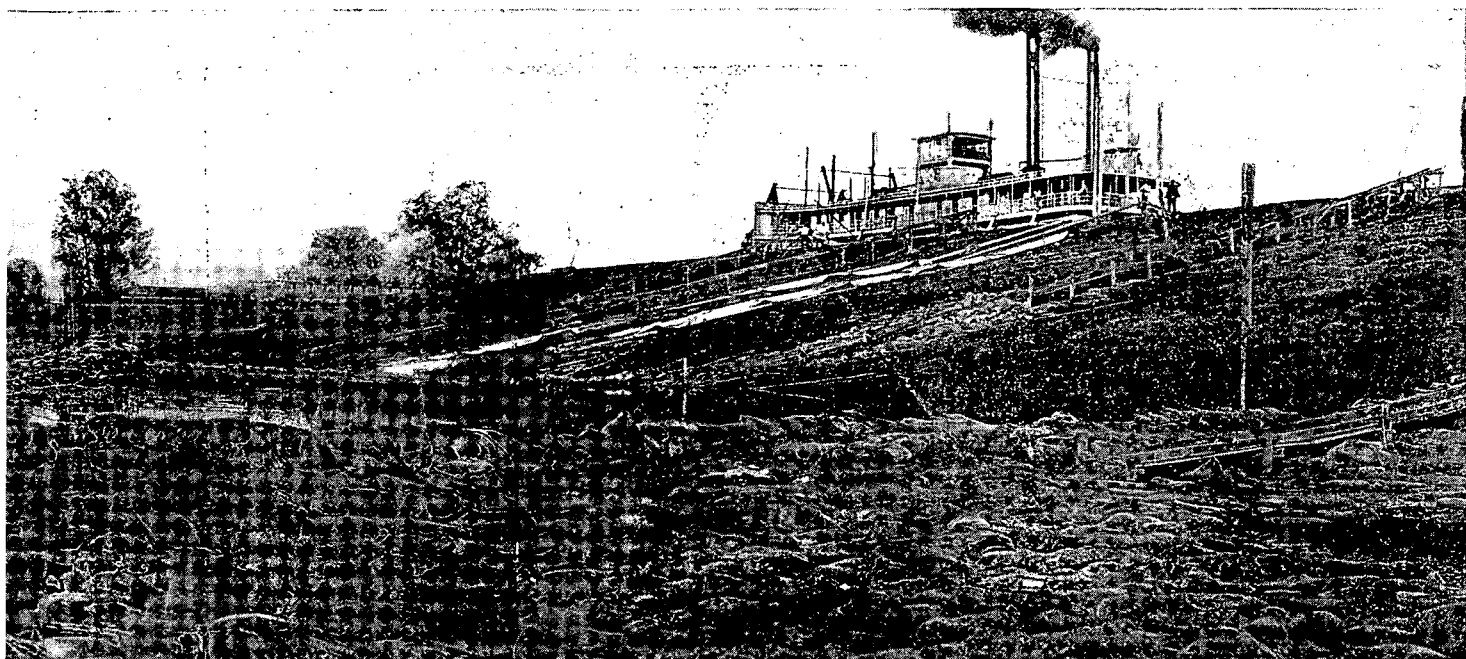
thinks and acts according to an established military discipline. There are sometimes strange conflicts between military discipline and the facts of particular situations. If I wanted a war fought, I would send for him. If I wanted a law case put through, I would send for a man interested in the law, I would not send for a soldier. Nor does a railroad company send for an army engineer to plan or execute difficult railway work. If I wanted a river controlled, I would send for a man who had studied engineering as a civilian in a civilian school. He is interested in engineering. Perhaps the type of man employed in the past helps to explain the reason for the colossal failure of

The hill is a Mississippi levee. The steamboat shows that the water is near the top of this. The man shows how high the levee is. Sandbags in the foreground

the Mississippi after the chief of engineers of the United States Army had reported (Annual Report 1926, p. 1793): "The improvement is providing a safe and adequate channel for navigation and is now in condition to prevent the destructive effect of floods." It was these men who tried to dam up the Atchafalaya outlet and confine in the main channel twice as much water as it could hold. The result was the drowning of the Louisiana Sugar Bowl in May when New Orleans was so glad that she did not get drowned instead.

An example of the other type of man is found in Arthur E. Morgan, now president of Antioch College, and of the Morgan Engineering Company, in charge of a Mississippi survey. He has made predictions about Mississippi floods that came true; also he has probably done more successful flood-control work than any man acquainted with the Mississippi River. Perhaps he has done more than any man in the world. The flood-prevention works at Dayton are





LOOK DURING A FLOOD

When the levee breaks the river becomes a kind of deadfall for the whole countryside, all of which is much lower.

Some propose to build the levees still higher

chiefly his in conception, in negotiation with the public, and in execution. In 1913, when he was only thirty-six years old, his reputation was good enough to cause the people of Dayton to entrust him with their millions and their lives when the chief of engineers of the United States Army publicly condemned his plans. He now says the whole Mississippi problem needs to be examined anew.

There should be some kind of a board back of the technical men who do the work. Keeping it clear of politics is one of the tasks of the century. Can it be done? I suggest the following board as a possible way out of this difficulty:

One member each appointed by Pittsburgh, Cincinnati and New Orleans named by the mayor, the most representative commercial organization and the president of the university.

One each by Louisiana, Mississippi and Arkansas, named by the governor, the director of the State Agricultural Ex-

periment Station and some fairly representative organization of farmers in the flood area.

One familiar with the Agriculture of the hill country, named jointly by the directors of agricultural experiment stations in Missouri, Illinois, Indiana, Ohio, West Virginia, Kentucky and Tennessee.

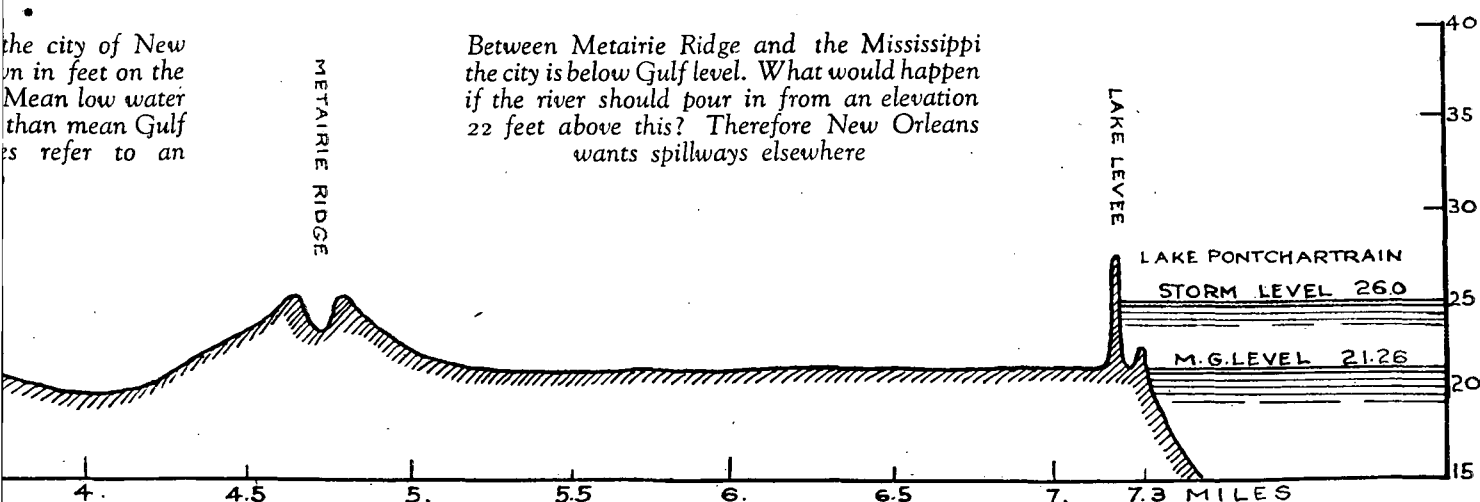
Four by the President of the United States, one of whom shall be an expert in forestry, one in navigation, one in water-power. The lower river would have four, the upper river three, the nation four. No bloc would have a majority. All interests would be represented.

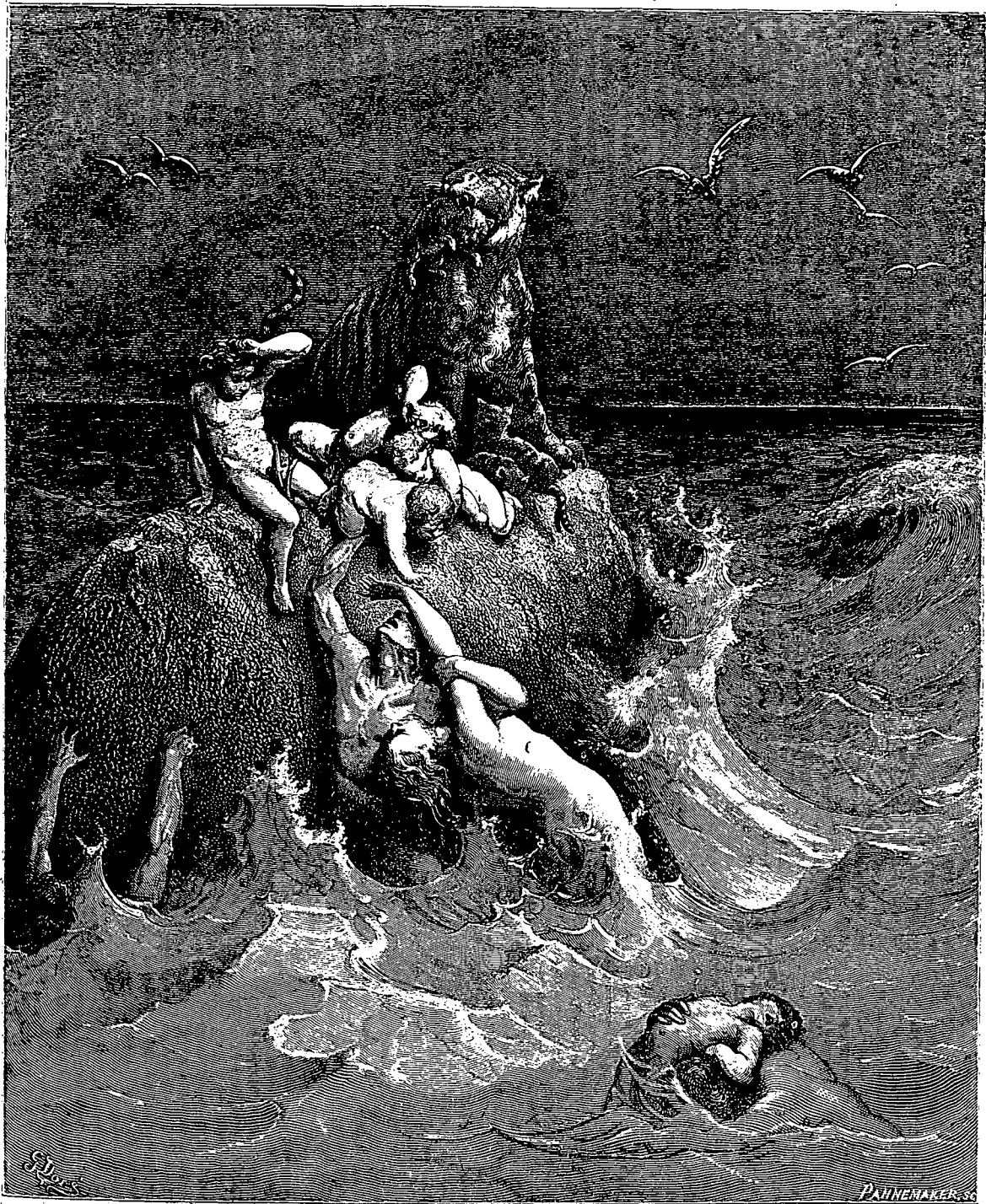
Who will pay this bill and who will get the direct cash benefits?

Perhaps when the bill of costs for such adequate plans is seen, the only way out will be for the United States government to take possession of the large area of swamp now held by corporations, protect it, reclaim it, own it and rent it. It is almost sure to be rented by some one. It is one thing a tenant cannot hurt. There are not many such in this world.

the city of New Orleans in feet on the Mean low water than mean Gulf level refer to an

Between Metairie Ridge and the Mississippi the city is below Gulf level. What would happen if the river should pour in from an elevation 22 feet above this? Therefore New Orleans wants spillways elsewhere





From the engraving by Gustav Doré

THE DELUGE