THE ROUT OF THE GREEKS.

COWARDICE THE CAUSE OF THEIR PANIC-STRICKEN FLIGHT.

Thessaly Not Lost by Fighting, but by Cowardice, English Correspondents Say—Blind Terror Inspired by the Name of the Turks—A Greek Army Put to Flight by Sheep—The Situation in the Island of Crete.

LONDON, May 11.—The more we learn of the story of the Greek *debacle*—and I include both the Thessalian and the Epirus campaigns in the term—the more disappointing and exasperating the pitiful record becomes. No amount of explanation, I fear, will rescue the good name of Greece from the sad disgrace which this foolish war has put upon it. Too much of the testimony which condemns her is the unwilling accusation of friends for it ever to be argued or explained away. The causeless, panic-stricken flight of the Greek army in Thessaly is by no means an isolated event. It was duplicated in the retreat of the army in Epirus to Arta, and it was repeated in less degree after the battle at Velestino. I am far from indorsing the sweeping verdict of some of the English correspondents that the Greeks are cowards, but that there was cowardice on the part of more than one prominent Greek commander there can be no longer any doubt.

The literature of the campaign has been enriched during the past two or three days by several contributions which lose nothing in interest by somewhart tardy reproduction. Mr. Steevens has given us in the *Mail* a military description of the loss of Thessaly to the Greeks, which, while painful in its reflections upon the

FIELD MARSHAL EDHEM PASHA.

honor and courage of the defeated people, is picturesque and historically valuable. He writes from the standpoint of the Turkish army with which he is stationed:

"On Friday evening we were in position to fight a great battle for Thessaly. To-day, or Tuesday evening, we are practically its masters, and we have not lost half a dozen men between then and now. How did it all come about?

"Thessaly was not won by fighting, for there was no fighting to speak of. It can hardly be an exaggeration that over 100,000 men have been engaged in this campaign, and I am pretty sure that the total killed of both sides is well under 1,000. Nor was Thessaly won because of the intelligence of the Greeks, who calmly decided that it was impossible to hold it. They had resolved to hold it; they had selected their positions with care, and fortified them. There is only one answer to the question how. Thessaly was lost by cowardice—rank cowardice. The Greeks had wished to hold it, and they were not fought out of it. They lost heart and bolted.

"The collapse began on Friday. That day the position was exactly what it had been all the week since the close of the battle of Milouna, on the second evening of the war. On Easter Sunday evening the Turks won the neck of low hills, and by consequence drove the Greeks from the narrow end of the V-shaped plain below. The left of our position rested in the village of Karatsali, secured by the hills above; its right extended over the plain to where we held the hills on the other side also. The Greek right faced our left in the village of Deliler—a long, straggling group of stone and mud cottages, nominally two villages, really one. Thence their batteries stretched across the plain to a little round hill, and thence on again to Turnavo on the right. Above Turnavo they held the formidable mountain of Kritiri—Losphaki the Turks call it—the highest point of the frontier range, almost perpendicular, approachable only in front by a stony ravine, defended by guns and tier on tier of escarpment and stone wall. Between the armies lay fields of barley, already waist high and in ear; dry fallows, where every shell and bullet, hoof or foot kicked up clouds of dust, with grateful patches of thick wood. All that you saw from the Col of Milouna. No troops could cross the brown without showing dust storms on it; none could cross the green without showing black lines for infantry, black and brown and white lines for cavalry, black blots with smaller black satellites grouped round them for guns. You could see every move on a chessboard a hundred square miles in size, with 80,000 men for pieces, and the fate of two nations for the stake. It was the finest place to see a battle one could imagine. Only—only there was no battle to see.

"Of course, we had the advantage in numbers; but the Greeks had the odds of position. The Greeks may have numbered 30,000, the correspondent on the other side can tell you more about that. We had in front a division and a half—say 20,000; two divisions on the right, and another expected from Karya on the left; altogether well over 60,000 men against 30,000. Only of the 60,000 25,000 or so were neutralized by the position of Kritiri—or had tried in vain three days to take it and thought they were, which came to the same thing—and 15,000 or so had not arrived. The Greeks might have fought.

"'We fear God, but nobody else in the world,' remarked the Athens *Star* a day or two before. But events proved that they feared the Turks.

"On Friday there were operations on the left with a view to facilitating the juncture with Hamdi Pasha when he came up. His division had taken five days to clear its front of the determined attack made at Karya. But when he came the Greeks would be outflanked on their left; unless they beat him or us they must fall back, leaving Turnavo and Kritiri, and letting in the divisions of Neshat Pasha and Hairi Pasha on their right flank also. On Friday, therefore, Edhem Pasha directed an attack on Deliler.

"It began with the artillery, and with the artillery, as it turned out, it practically ended. It began in the centre of a smart cannonade from either side. Both shot wild at first; the Turkish shrapnel burst in little white balloons the height of Nelson's column above the Greek batteries; the salvos from the Greek batteries raised six separate whirls of earthy cloud, now in the plough before the Turks, now in the plough behind them, but on them never. But presently the Turks began to drop shells right into the little black swarming anthills that stood for Greek guns; the Greeks went on banging away, now short, now over, the whole afternoon.

"Meanwhile, the main attack was developing two miles to the left. Here also the Turkish artillery was putting in splendid work. A vast ploughed field, perhaps half a mile, perhaps a mile, across, lies before the village of Deliler; at its right-hand top corner is a big square, many-windowed, gray-brown house on a little knoll; it may be a convent, it may be a private house, but it looks like a furniture repository. To the right the knoll slopes down among trees to a little minaret; this point was the fulcrum of the defence. All Riza Pasha, enjoying himself thoroughly, as always when his darling guns are in action, moved three batteries nearly up to the edge of the ploughed field, well under the fire of the Greek skirmishers, and plugged round after round plump on to the knoll. The infantry, meanwhile, was stealing round on the right. Covered by trees the black dots strolled leisurely forward. From above they did not seem to move; they looked like pieces on a board worked automatically by some great player behind. They established themselves on the right of the minaret, and the curling blue smoke showed they were making good use of the position. The Greeks knew it, too; they advanced a battery on their right and fired at Riza's guns. They shot miserably as ever, and Riza took no notice. They advanced half the battery nearer still; it still took no notice.

"And now was come the moment for the main attack—infantry across the great fallow. Little dots of skirmishers, little clumps of main body, black lumps of supports began to dapple the brown. Slowly, slowly they moved—but they moved. The field began to be full of them. It began to be so full that the men seemed to be standing still and the field to be drawn slowly back through them, like the great brown roll of a musical box through the black teeth. Now they were nearly at the green margin beyond; now they were on the very edge; now they were over and scampering up the slope. The fight was over, too. Some little black dots and streaks, some wisps of blue smoke, some puffs of shell—that was the fight that won Larissa.

"For next morning the Greeks were gone. Gone from the line of intrenched batteries, gone from the little round hill, gone from Turnavo, gone from impregnable Kritiri—clean gone, and could not be found anywhere. Next afternoon they were gone from Larissa also. At 11 that night our cavalry stole up to the intrenchments and found them empty. The town was garrisoned by released pickpockets and wife beaters; the Greek army had vanished. At daybreak two squadrons of cavalry approached with one battery of horse artillery. The pickpockets fired, but a shell or two and a volley from the carbines of one squadron silenced them. The other squadron advanced over a little wooden bridge into the town. The big stone and iron bridge over the Salamvria—here fast and deep, and as broad as the Thames at Oxford—the pickpockets were going to dynamite. But four horsemen dashed across—and the rest you know. Town and fortifications, guns and ammunition, provisions and fodder—the Greeks had taken to their heels and left it all.

"If the Greeks have yet lost a thousand killed in this whole war, then I can only say the Turks have enormously underrated their own success. If the Greeks have some deep-laid scheme of drawing back to dance—or to make us dance—the better, then nobody here seems to have the least comprehension of the strategical situation. For the present there is only one possible explanation: cowardice—rank cowardice; and I do not see where the military consequences of the Greek flight are to end. They say the greater part have retreated to Pharsala, and might defend the old frontier along the line of Mount Othrys through Dhomoko. But they lose Thessaly, they lose the force at Trikkala, their railway, and their depot at Volo.

"They lose everything, including honor. A brave race may swagger; an unwarlike race may placidly confess to cowardice. But for a race of swaggerers and cowards at the same time there is no place—in Thessaly, at all events."

Another correspondent describes briefly the blind terror which the mere name of the Turks inspires everywhere among the Greek population in Thessaly. Riding after the Larissa retreat between Volo and Velestino, he says:

"We passed through a dozen villages, in each of which there were one or more houses on fire. This was assuredly not the work of the Turks, for no troops had gone by that route; but it might have been done by the villagers themselves before leaving, by the Greek stragglers from their army, or by the jail birds released at Larissa or Volo.

"In none of the villages had a single inhabitant remained. The falsehoods invented by the Greeks of Turkish atrocities have been the cause of enormous misery, distress, and loss to the villagers of the Thessalian plains, for, believing that they would be massacred as soon as the Turks arrived, they have fled, taking with them only what they could carry. Had they remained behind they would have suffered neither insult nor injury from the Turks, whose conduct has been beyond praise.

"Agiorgics was entirely deserted, and along the road thence to Volo we did not encounter a single person. The road was littered with the débris of the fugitives, enormous numbers of cartridges especially having been thrown away. When nearing Volo we found, for the first time, a village inhabited. The people told us that we were the first persons who had passed that day.

"We entered the town at 6 o'clock. Our arrival created a sensation, as we were taken for Turkish officials of some kind in advance of the army. Some of the people took to their heels; others came up and bowed low. An archpriest menaced us with a gun. However, when convinced that we were English and in no way hostile, matters settled down."

It should not fail to be noted in all the accounts which are given of the wonderful forbearance of the Turkish troops that the Sultan has proved too much. He has furnished in this war with the Greeks his complete condemnation under the indictment of full responsibility for the Armenian atrocities. His only defense, it will be remembered, was that he was personally blameless because he was unable to control his own troops. It has been demonstrated in the past three weeks that no civilized troops in the world are under more perfect control than these same soldiers who are winning easy victories over the Greeks. But nobody in Europe ever gave much weight to the wily Sultan's denials.

I have sent by cable Allen Upward's interesting description of the sad flight of the Greeks from Epirus. It is a pitiful story, and some features of it are dwelt upon in a graphic letter to the *Pall Mall Gazette* from one of its correspondents. He writes:

"The Turks had made an attack upon the Greek outposts near Pentepighadia. the Greek cavalry had fled at once without offering resistance, the infantry had followed its example, and though a gallant attempt had been made by the artillery to stand to their guns and stop the flight of the runaway battalion, they had failed to achieve this, and a general panic and wild rout had been the result. The Greeks had lost only a few men, half a dozen at the most, and a dozen wounded, and they had saved their guns. They had not stopped to be shot down. Taking advantage of the cover of the rocks and of the darkness of the night, they had simply run to Filippiada, which town the escaping soldiers, in spite of their officers' orders, had set fire to, and thence had been told to retreat to Arta, and take up the positions occupied before the war began. Indeed, no other order was possible. It was a sad sight to watch these beaten troops, as the dawn rose, come stumbling in, the much-vaunted Evzones, with none of their proud dancing gait of the previous week, when they passed through Arta on their way to the front, the cavalry draggle-tailed and downcast, tears streaming down the faces of the officers, the men sullen and slow to obey, then the irregular trooping of the infantry in broken bands, followed by the rattle of the artillery, the only arm that seems, in this sad defeat, not to have yielded to frenzied fear. It would not be fair to blame these poor fellows too much. Not one of them, officers or men, had ever been under fire before this foolish war began. And the odds against them might have disheartened the sternest veterans.

"I wandered with another correspondent, while this mournful procession was passing through the streets, into a soldiers' canteen to get a glass of milk. Before we could pay, a tall, bronzed soldier lad had put down the twopence, which paid for it, faithful to those traditions of persistent hospitality which pursue the foreigner throughout Greece. There was something specially touching in the naive attention.

"I walked toward the bridge and purchased a loaf of bread, a useful precaution, for nothing could be obtained in the town a couple of hours afterward. The long line of refugees seemed unending. Col. Manos could be seen hurrying about in the neighborhood of his headquarters giving orders. When day arrived the inhabitants began to collect, panic-stricken, in the streets. Crowds of them fled down the high road to Kompoti, carrying their worldly possessions on their heads. I met one old blind woman wandering away alone wailing. On the street corners little knots of people began to collect, excitedly discussing the situation. A strong feeling was being expressed against the commanding officers. It was said that if Col. Manos showed himself he would be shot. The King was roundly abused, and the word treason generally pronounced, just as it was after the Franco-German war.

"'We have been betrayed by our commanding officers, by our Government, by our King,' said street orators, who very plainly had never shouldered a gun.

"At one moment it seemed likely that the mob would attack the Commander-in-Chief's quarters, and perhaps loot the town. Fortunately, some intelligent citizen set the bells a-ringing, which seemed to have a calming effect. A shout went under Col. Manos's windows of 'Zeto polemos,' and then a citizen made a speech requesting the Commander-in-Chief to state whether the inhabitants could safely remain in the town with their families. After a brief lapse of time the Colonel appeared on his balcony, upbraided the mob for making a noise, and assured them that they could remain with safety.

"It is difficult to describe the state of utter despair which filled every heart in Arta after the disastrous retreat of the Greek army from Pentepighadia. The officers in particular were overwhelmed with grief, and it was impossible for them not to feel ashamed at the easy rout of their troops. There is, of course, an excuse for the Greeks, that a very large proportion of them had never been under fire before, and that they were ill commanded. The conditions of military service in Greece are unfavorable to the constitution of a well-disciplined army. The Greek is not easily amenable to discipline. He prefers to argue with his commanding officer rather than to obey orders, and so universal here is the instinct of discussion that the officer himself in many cases cannot resist joining in the argument. The officers are seeking all kinds of political reasons to excuse their failure. One officer assured me it was the fault of Russia, who had prevented Servia and Bulgaria from joining their forces with those of Greece. Certain it is that the Greeks have everywhere been disappointed in their hope that the populations of the Turkish provinces which they have attacked would render them armed assistance.

"All that we see here of any sympathy for Greece on the part of the Epirotes is the continual arrival from across the frontier of hundreds of thousands of sheep, the Epirote shepherds being afraid (quite unnecessarily, I should imagine) that should the Turks advance their flocks will be confiscated. At the time they are doing a roaring trade, and selling their lambs to the Greek soldiers for about three times the normal price. The hills all around Arta are simply one moving mass of long-fleeced sheep and lambs, from which there rises a loud continuous roar of bleating and tinkling of bells, which is orchestral in its effect. It was partially this noise that caused the débâcle of the Greek army. The shepherds in the neighborhood of Pentepighadia were driving their flocks by night toward the Greek frontier. It is their habit to fire guns at night, the noise of which frightens the sheep together into compact masses (very few of the shepherds have dogs), and it was this fusillade which startled the Greeks at Pentepighadia into thinking that the Turks were upon them. It is sad to have to relate that the descendants of the heroes of Thermopylæ should have run away from a flock of sheep; but these are *fin de siecle* times.'

The Turks, and the Greeks also, for that matter, are armed with all sorts of modern firearms. Infantry weapons have been so changed and improved since the last great war that the old stories of how it seems to be under fire are now all out of date. The minié ball and its baneful cry, so familiar in our civil war, plays no part in this campaign. The sound made by the four or five kinds of bullets used by the Turks is thus described by a *Chronicle* correspondent, who lay behind a stone barrier which he had constructed under a hot fire that continued all day in one of the engagements in Epirus:

"By the way, the voice of a bullet is very various. There is the thin, high whistle, to which no one pays any attention after the first half hour. There is the prolonged moan, 'the cry of a lost spirit,' as a novelist might say. There is the wolfish howl, which for some reason always seems to be taking one on the flank instead of fairly in front; and last of all there is the low, ill-tempered buzz, as though the nasty thing had got out of bed the wrong side, as children say. It is far the most terrifying, especially if it suddenly stops as the bullet strikes something close at hand. It was to those bullets only that we politely wished 'good morning.'"

The collapse of Greece and her evacuation of Crete have apparently made no change in the situation in that unhappy island, as far as the attitude of its Christian population is concerned. A correspondent of the Manchester *Guardian*, writing two days before Col. Vassos was recalled, gives this most interesting statement of the problem there:

"Crete is still assumed to be a portion of the Turkish empire. The 'insurgents,' or the 'Christian patriots,' as I should prefer to call them, have, however, entire possession of the island, with the exception of the seaport towns, into which they have driven the Mohammedan population. There the latter remain hemmed in on every side, and only protected by the guns and troops of the international forces. If it had not been for the presence of these the insurgents would most assuredly have driven every Mohammedan out of the island. Round Canea the Turkish outposts are being gradually relieved by the international troops. What may be the meaning of this measure it is difficult to say, for as yet there is no sign of the Turkish forces being withdrawn from the island.

"In Col. Vassos's camp I had one or two short conversations with some Cretan gentlemen of considerable education and intelligence who spoke French fluently. Their views, which may be of interest, were expressed as follows:

"'We have been struggling for centuries to free ourselves from the intolerable burden of Mohammedan rule, and now we have come to the conclusion that we can submit to no form of it, however specious may be the title it is given. We know what 'autonomy under the suzerainty of the Sultan' means. It means that the Mohammedans will remain the dominant class, and that all the officials will be either Mohammedans or else under Mohammedan influence. We will have none of it. The island is ours by inheritance from our ancestors, and the administration must be in our hands. The Turks began these troubles. They thought to massacre us as they had massacred the Armenians; but we are not Armenians, and if there is to be massacring we are determined that it shall not all be on one side. We can no longer live side by side with the Mohammedans. As long as they remain in the island we shall fight them. We are the more numerous and are well armed, and they must go. Nothing less than this will satisfy us. We are not fighting against the English, Russians, French, Italians, &c. We are only fighting against the Turks for the security of our lives and property, and for the honor of our wives and daughters. Why, then, do these nations combine to support the Turks against us? Are they allies of the Turks? If it had not been for their presence we should have driven every Mohammedan in the island into the sea.'

"It must be understood that wherever Islamism has spread its conquests all converts to its creed have, *ipso facto*, become incorporated in the nationality of the conquering race, and thus become completely severed from all ties with their original stock. More than this, it is a notorious fact that renegades and the descendants of renegades are possessed with even a greater fanatical hatred of all 'infidels' than those of pure Mohammedan descent. In the case of the Christian nations who have been conquered by the Turks, the term 'Turk' has become synonymous with that of 'Mohammedan,' and thus all Mohammedans are among those commonly described as 'Turks.' 'Greek' is applied exclusively to Christians, and to talk of a 'Mohammedan Greek' is as absurd as it would be to talk of 'Mohammedan Hindoos.'

"The relative positions of the Mohammedans and Christians in Crete are, indeed, exactly on a parallel with those of the Mohammedans and Hindoos in India. The Hindoos conquered by the Mohammedans comprise as many races as do the Christians conquered by the Turks, but, as has been said, no well-informed person would any more dream of talking of a 'Mohammedan Greek,' or a 'Mohammedan Bulgarian,' or a 'Mohammedan Armenian' than he would of speaking of a 'Mohammedan Rajput' or a 'Mohammedan Sikh.' The Mohammedans in Crete constitute a perfectly distinct community from that of the Cretan Christians or 'Greeks,' and though these two communities live side by side with one another, as do the Mohammedans and Hindoos in India, an equally deadly hostility exists between them which only needs the slightest provocation to break out into murder and rapine. Of the bitter animosity existing between the Mohammedans and Hindoos in India we have had ample evidence of late years, and we have only to substitute Cretan Greeks for Hindoos to picture to ourselves what must be the sentiments entertained toward one another by the Mohammedans and Christians in Crete." H. R. C.

THE NEW BRIDGE STATION.

Plans for the New York Terminus of the Structure at Blackwell's Island.

The only railroad station for passengers in town, except the old Hudson River Railroad station on West Thirtieth street, now used for suburban trains only, is the Grand Central Station, which, under plans recently filed, is soon to be enlarged, as it is wholly inadequate for the business centring in it. It is soon to have, if present plans go through successfully, a rival for the passenger business of New York, starting from the east side of town. When the New York and Long Island Bridge, the Blackwell's Island steel cantilever bridge, as it is called, is completed, there will be a station at the New York end of it, at Third avenue and Sixty-fourth street, or, rather, on Third avenue, between Sixty-fourth and Sixty-fifth streets, and covering the entire block between Second and Third avenues. This station will be 610 feet long by 200 feet wide, and the platform will be 54 feet above the street level. The basement will be occupied by the machinery for the elevators and by a large cold storage plant. The space devoted to cold storage alone will comprise 500,000 cubic feet.

On the ground floor there will be stores, a restaurant, and a central hall 50 by 70 feet, facing which there will be six large elevators, each having a floor space of 150 square feet. Behind the elevators will be two express office rooms. A covered carriageway will lead from Sixty-fourth to Sixty-fifth street. The space from the carriageway to Second avenue will be given to a market. The second floor will be at the same level as the platforms of the elevated road on Second and Third avenues. It will contain a passenger room 50 feet by 150 feet, several restaurants, and a number of galleries from which it will be possible to look down upon the market below. Above the entrance hall, on the second floor, will be a waiting room, 80 feet by 175 feet, and ticket and telegraph offices. Outside the waiting room will be a broad platform extending to the track buffers. There will be twelve tracks in the station, and the whole will be covered by a roof resting on arched steel trusses. The length of the Grand Central Station is 695 feet and the width is 240 feet, so that the new station when completed will be smaller than the Grand Central.

New York is peculiar among American cities in respect to its lack of railroad facilities for passengers, for, although thousands of passengers arrive or leave daily, the number of those who are able to take the cars in New York without the intervention of the ferries is limited to such as start from or arrive at the Grand Central Station. There are some passengers who start from the 155th street terminus of the elevated, which is the landing place of the New York and Northern Railroad, and others who start from the Thirtieth street station of the Hudson River Railroad at Tenth avenue, but both stations are a part of the same railroad system, as are the landing places maintained by the Harlem Railroad at East 110th and East 125th streets. The length of the new Blackwell's Island Bridge is to be two miles. Thirty thousand tons of steel are to be used in it, and it will cost about two-thirds as much as the Brooklyn Bridge prior to its opening in 1883.

Six Months' Notice Bars Elopements.

From the Pittsburg Dispatch.

YOUNGSTOWN, O., May 19.—The Board of Education has adopted a rule that may play havoc with Cupid's plans. During the last year a number of lady teachers married and the Superintendent thought it more or less marred the work of the schools. As a result teachers hired for the next year must sign an agreement by which they promise not to get married without giving six months' notice.

THE MISSISSIPPI PROBLEM.

TREAT THE RIVER AS A GREAT CANAL AND PROVIDE WASTE-WEIRS.

This, in Brief, Is Herman Haupt's Solution of the Question—Where the Levee System and the Other Systems Proposed Fall Short—A Combination of All Systems Necessary.

Engineers and scientists have differed greatly as to the proper means of improving the navigation of the Mississippi River and of preventing the destructive overflows which have resulted in loss of life and destruction of property to the extent of hundreds of millions.

So contradictory has been the testimony before Congressional committees that even the most intelligent members have confessed themselves hopelessly mystified and unable to reach conclusions satisfactory to themselves.

But it cannot be possible that a problem involving simply an application of natural laws can be incapable of solution. There must be some way of overcoming the difficulties, and as a preparatory step it will be proper to state the conditions, and, so far as may be practicable, eliminate errors and misconception.

Geologists inform us that the mouth of the Mississippi was in former ages at its junction with the Ohio, and that all the country to the present outlets, a distance of 1,100 miles, constitutes a vast alluvial deposit which is still rapidly extending by encroachments upon the Gulf of Mexico.

The difference of level between Cairo and the Gulf is 330 feet, and as it cannot be assumed that the ocean has changed materially in its mean level, the level of the land in the upper part of the delta must have been raised by successive deposits to the extent of this difference, or 330 feet.

Here is one fundamental fact in the solution of our problem clearly established, that the effect of the overflows through successive ages has been, not only to raise the general level of the country, but also the bed of the stream, for if the bed were not raised the water would be over 300 feet deep at Cairo.

FALL OF THE STREAM.

In the ordinary stage of water the fall is said to be 5 inches per mile from Cairo to Memphis, 4 inches from Memphis to Vicksburg, 3½ inches from Vicksburg to the Red River, 2 inches from the mouth of Red River to New Orleans, and 1 inch from New Orleans to the Gulf.

The Mississippi drains the whole area from the Alleghany to the Rocky Mountains, embracing 1,240,039 square miles, while the remaining territory of the United States, not including Alaska, contains only 1,785,561 square miles. This valley, therefore, contains more than two-fifths of the area of the United States, and its proportion of population is three-sevenths.

The tributaries, especially the Missouri, transport immense quantities of material, the heavier portions of which are deposited in transit, and only the finer portions of the clay and mud held in suspension, are carried to the Gulf. This material is so fine that if a quart of water be placed in a glass jar and set away it requires some ten days for the water to become clear, and yet the quantity of this material carried into the Gulf is so enormous that since 1838 the fill ten miles out from the Pass has been 620 feet, which at the same rate continued would carry it to the surface in eighteen years.

The lower valley of the Mississippi embraces an area of 30,000,000 acres of the richest land in the world, and as the river increased in length, there being then no levees, the banks were lifted up by the deposits in overflows, the heavier portion being dropped nearest the river's margin; consequently the banks are found to be from ten to fourteen feet higher on the immediate margins of the river from Cairo to New Orleans than are the lands one mile back from the river. Each successive high water has deposited its stratum clear and well defined.

As only the finer particles of transported materials are carried to the Gulf, the quantity deposited in transit must be immense; but as there were formerly no levees, it was spread over an area of great extent, the St. Francis bottom alone extending 190 miles in a straight line with a width of thirty-five miles.

That the tributaries furnish and the Mississippi transports an immense amount of material, only a portion of which reaches the Gulf, is a second important fact which must materially influence a decision upon any plan for protection or improvement in or along the stream.

The expenditures upon the Mississippi have been made or recommended with a view to improve the navigation of the river and to protect the arable lands from overflow. The means of accomplishing these results have been made the cause of much contention, and great diversity of opinion continues to exist, which frequent and protracted hearings before Congressional committees, so far from removing, have apparently only served to intensify.

The plans or systems of improvement proposed have been:

1. A system of continuous levees raised above the limits of the highest floods.
2. The outlet system, which aims to reduce the maximum flood heights by means of openings for free discharge of a large percentage of the flood waters.
3. Contraction by wing dams or jetties to create a scour upon bars and thus increase the navigable depth.
4. Revetments for protection of banks at all points where the abrasion of the current causes the removal of material.

This list embraces the systems that have been the chief subjects of controversy, and an effort will be made to show that neither of them will accomplish singly the object sought to be attained, and not even a combination of all will be successful without important modifications.

THE LEVEE SYSTEM.

The levee system will be first considered, as this is the one upon which the largest expenditures have been made, which has the support of Government engineers and property owners.

The first question that presents itself, and one that is vital in reaching a satisfactory conclusion, is, will the construction of high levees on both sides of a stream flowing through alluvial plains cause deposits on the bottom and a rise in the bed that will require continual additions to the height of the levees?

Both affirmative and negative answers have been given to this question and that too, positively and confidently.

The Hon. N. C. Blanchard, Senator from Louisiana, made the statement that De Prony had asserted that the bed of the Po had risen, but that this theory had been completely demolished by a great Italian hydraulic engineer who proved conclusively that the Po had not raised at all through two centuries.

De Prony was one of the most prominent of hydraulic engineers and his opinion is confirmed by the eminent geologist, Sir Henry T. De La Beche, C. B., F. R. S., who in his "Geological Observer," page 61, uses this language:

"It is interesting to observe, in some countries, in Italy for example, where artificial embankments have been found to keep the rivers flowing through fertile plains in their channels, that the beds of rivers get thus above the plains. The Po presents on a large scale a well known example of the rise of its bed, so that it is higher than the houses in Ferrara, and the like may always be expected under similar conditions."

Mr. Regan said: "While the engineers are for the levee system and while the people along the Mississippi River seem to be for the levee system, my investigations have brought my mind to the conclusion that the system is a failure for all time, and, as an illustration of that, the Hoang-Ho, or Yellow River, one of the great rivers of China, has been leveed for centuries, until the surface level of the river has been raised as high as the tops of the ordinary houses. That was demonstrated by the history of the river many years ago. It broke its levee and drowned about a million of people and destroyed millions' worth of property. Recently it broke its levee again, with immense destruction. There is also a river in Italy, the Po, that gives exactly the same experience. It has been leveed until the surface level has been raised as high as the tops of ordinary houses, and the burrowing of a crawfish or an otter might deluge and destroy large regions of country. I want to add that it seems to me the plan laid down by Col. Elliott of the Engineer Corps nearly fifty years ago, being the outlet system, is the true one to relieve the Mississippi of these floods."

The *Louisiana Planter* of May 1, 1897, observes: "Those familiar with the levees of this State will readily recall what frivolous structures successfully excluded the flood waters from most of our alluvial lands thirty years ago. The grand levees that have since been constructed and that stand to-day entirely uninjured and above any flood height yet reached testify to the fact that we only need to make the rest of our levees equally high and equally strong to exclude all floods of which we may have any reasonable fear."

This reasoning is unsound and the conclusions erroneous. If flimsy structures successfully resisted the floods thirty years ago and much higher and stronger structures are required now, does it not clearly prove that from some cause the floods must have been increasing in height and in violence, and what cause can be assigned except the effects of the levees themselves?

Again, if levees are to accomplish the object for which it is claimed that they are constructed, they must be continuous and all outlets must be closed. In the flood of 1882 it was ascertained from careful observations that the total maximum discharge was 2,000,000 cubic feet per second, while for a hundred miles by river at and above Lake Providence and for another hundred in the vicinity of New Orleans the discharge in the channel with overflowing banks was but 1,000,000 cubic feet per second. The other million was finding its way to the Gulf through the swamps. This fact is indeed startling. With closed continuous levees double the quantity of water would be thrown into the channel. If the height of levees were doubled the quantity of material would be increased fourfold, and even this would not give permanent security unless there could be positive evidence that there would be no deposits to cause an elevation in the bed of the stream.

That deposits must be formed, and this, too, of enormous magnitude, is proved by the fact that the bed of the stream in the upper part of its course has been raised by such deposits, even without the aid of artificial levees, to a height of over 300 feet, and that, too, by the comparatively small percentage dropped in the stream itself, the greater portion of the transported material being scattered over an area of hundreds of square miles.

Since only the finest particles of mud are carried into the Gulf, all the heavy material, as also all the wash from the banks, must necessarily be deposited in the bed of the stream, for, with high continuous levees, there is no other place where such material could be deposited, and it is not within the bounds of possibility that levees could be constructed so high that the floods in time would not overtop them. The statement that recently constructed levees have proven so strong that the floods have been resisted is no doubt true, but why? It is because other places have been weak and have given way. Crevasses have occurred and relief has thus been afforded, and there are still numerous outlets, as safety valves, that have not yet been closed. Close all the outlets and make the levees continuous, and the history of the Hoang Ho will be repeated in the valley of the lower Mississippi.

In a valuable paper by Prof. J. B. Johnson, read before the American Association for the Advancement of Science, September, 1884, this language is used:

"It would seem, therefore, that in the river's present condition there is no evidence that a confined flood will scour out its bed so as to facilitate the discharge, and there is considerable evidence against it. If the river flowed between straight parallel banks, such as Capt. Eads has constructed at the mouth of the river, then there could be no such thing as discontinuous transportation of sediment and hence no alternate scour and fill. Then concentration of volume would be beneficial and would ultimately lower the river bed. But this condition of things can never be reached on the Mississippi River, and hence the concentration of flood volume will be harmful rather than beneficial."

The conclusion from a voluminous array of facts, opinions, and testimony is simply this, that levees are necessary locally to prevent overflow of arable land, but that continuous levees with closed outlets will increase the height of floods and render them more unmanageable.

THE OUTLET SYSTEM.

The advocates of the outlet system claim the ability to reduce the height of the floods and prevent overflow by providing outlets to secure a more rapid discharge of the water in time of flood by a more direct channel to the Gulf.

It is stated that a crevasse at Bonnet Carre, a short distance above New Orleans, which discharged one-twelfth of the flood water through Lake Pontchartrain, in going six miles instead of 160 miles to the river's mouth, lowered the high-water mark at New Orleans from three to four feet, where the rise and fall was seventeen feet, and lowered it at Natchez, 300 miles above, from six to eight feet, where the rise and fall was fifty feet.

It is also claimed that an outlet one mile wide by ten to twelve feet deep, with a fall of twelve feet in going six miles to Lake Borgne, would divert one-twelfth more of the discharge and reduce the high-water level at New Orleans in all eight or ten feet, and at Natchez from fourteen to fifteen feet.

There can be no question that outlets will greatly reduce the height of floods if properly located and of sufficient number and size. In fact, nature provides them for its own relief, by means of the crevasses, which afford protection to localities many miles distant. It would seem, therefore, that permanent outlets properly located should afford permanent relief. Objection is made that the change in the velocity of the current below the crevasses causes the formation of bars and results in an impediment to low water navigation.

This objection would have less force at the proposed Lake Borgne outlet, as the bottom of the stream is below the surface water of the Gulf, and the current is too feeble to produce much of a scour at any time. The diversion of one-twelfth of the flood waters would reduce the deposits in the delta.

It would not be difficult by means of an outlet of sufficient size to turn the bulk of the waters of the Mississippi into the Atchafalaya, which would give a shorter distance to the Gulf, a steeper slope, and a more rapid discharge, leaving New Orleans without a navigable channel.

What is needed is to maintain in the Mississippi the depth for navigation, and discharge the excess as rapidly and by as many outlets as possible, which requires that the outlets should not permit a discharge at too low a level.

CONTRACTION.

Contraction is a local remedy to produce a scour for the removal of bars and deepening of navigation. It consists in reducing the cross section and thereby increasing the velocity at certain points. In some cases it may be expedient to resort to dredging to secure a channel that can afterward be readily maintained in low water by a contraction of the cross section. It is in general easier to maintain a channel than to create it by means of scour. Contraction is one of the auxiliary means to which the engineers must resort in special cases. It is not applicable to continuous improvement.

REVETMENTS.

A river flowing through an alluvial plain has a constant tendency to change its course and produce a series of horseshoe curves. The constant erosion gradually reduces the distance across at the heel of the shoe, and at length a high flood breaks over and cuts away the intervening neck of land and creates a new channel, leaving in place of the old channel a bayou often many miles in extent.

This action often menaces important cities such as Vicksburg and Memphis and renders necessary protection against the eroding action of the stream.

It is also an object of great importance in the interest of navigation that the bank of the stream should be protected from this erosive action, since the vast amount of material removed must be redeposited at other points in the bed of the stream, forming serious obstruction to navigation.

The protection of the banks by revetments is therefore an object of primary importance, and the benefit to be derived therefrom is not merely local, but general. It concerns, however, the question of navigation rather than the protection of plantations from overflow.

THE TRUE SOLUTION OF THE PROBLEM.

The objects sought are twofold—to maintain a navigable channel and to prevent the destruction of life and property by floods.

The evidence presented should be conclusive that parallel levees of any height, continuous on both sides of the stream with outlets closed, will not secure the country permanently against overflow, but when the limit of the capacity for protection shall have been attained the damage from breaks will be vastly increased.

On the other hand, outlets at low water level may divert so large a volume as to reduce the amount below the limit required to maintain navigation.

What, then, is the remedy? Evidently to secure a rapid discharge of the surplus waters of floods and retain the volume required for purposes of navigation.

Fortunately the means securing these results are so simple and so entirely in accordance with the practice of hydraulic engineers in similar cases that it is really surprising that the problem should appear to present any difficulty, and that suggestions should have been made of a liberal premium to the engineers of the world for plans that will secure the desired results.

The remedy is found in the construction, not of outlets, but of waste weirs.

THE WASTE WEIR SYSTEM.

Every canal engineer understands that in constructing a summit level to supply lockage for his canal he must provide waste weirs, so that when floods fill the feeders and the canal level to a certain height the surplus will be discharged over weirs into the natural water channels of the country, and thus prevent a rise that would endanger the banks.

By a precisely similar arrangement extensive weirs could be provided at suitable points along the Mississippi, of which there are many, which would be inoperative under ordinary navigable conditions of the stream, but when the rise reached a level, to be determined by the engineers in charge, the surplus would begin to pour over the dams and discharge into the Gulf by the Atchafalaya, Yazoo, and other streams.

The effect would be to carry off a large amount of the sediment that would otherwise be deposited in the bed of the stream and form bars in the channel and at its mouth, and it would also help to fill up the swamps and thus in time add largely to the area of valuable arable lands.

The above is a mere outline. It is not possible in this paper to attempt to enter into details. A careful study will be required and the plans of improvement must be adapted to localities and conditions. It was a mistake to contend for the levee system, the outlet system, or any other system. The intelligent and practical engineer must carefully study all the phases of the situation and vary his plans accordingly. In some cases it may be expedient to hold back, if possible, the water of tributaries, as the St. Francis, by movable dams or gates at the mouth and allow the water to be discharged from the reservoirs thus formed after the sediment has been deposited in the swamps, thus sending clear water into the main stream to maintain navigation and reduce terminal deposits. Many other suggestions could be made, but they will naturally present themselves to any intelligent engineer to whom the work may be intrusted.

In conclusion the writer desires to emphasize his conviction that neither the continuous levee, the outlet, the contraction, nor the revetment system singly will prove satisfactory, and even the waste weir, as a system, must be supplemented by local constructions and applications, such as revetment to protect banks, contraction to remove bars, and local levees to protect plantations. It may be found desirable also to straighten the channel of some of the secondary streams, such as the Atchafalaya and the Yazoo, that receive the overflow from the waste weirs; to cut off some of the horseshoes, increase the velocity of discharge, reclaim land in these secondary valleys by low levees, flood the low lands by suitable appliances with muddy water to raise and enrich the soil, and resort to such other devices, applications, or constructions as may be suggested to improve existing conditions, but in a paper of this character cannot be anticipated.

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DUC D'AUMALE'S MONEY.

A Court Scandal of Louis Philippe's Day—Murder or Suicide of the Last Prince de Condé—Enthralled by a British Mistress—Intrigues to Gain an Adventuress's Favor.

In spite of his princely donation of the château of Chantilly to the Institute of France, the late Duc d'Aumale at his death was by far the richest member of the Orleans family. He was so popular in his later years that if he had been the eldest instead of the fourth son of Louis Philippe it is quite possible that the Orleans family would now be ruling France. But there was a time when the name of Aumale was hated throughout France on account of the scandal connected with the transmission of the great inheritance of the house of Condé to the late Duke. The Duke was guiltless, as at the time he was a child of eight, but the suspicion and irritation against Louis Philippe and his Queen, then barely seated on the throne, was so great that the house of Orleans came near being sent into exile within a few months of its elevation.

Of one portion of the Duke's fortune there is no story to tell. It came to him through his marriage with a very rich heiress, the only daughter of Leopold of Bourbon, Prince of Salerno, himself only brother of Francis I., King of the Two Sicilies. She brought her husband in consequence half of the private possessions of the Neapolitan Bourbons. The greater part, however, of the Duke's wealth came from the inheritance of the Princes of Condé, to which had been joined gradually the estates of several other extinct branches of the royal family. It included the château of Chantilly, which seems to have been a source of ill luck to its possessors for over a century. This inheritance was left to him by will by the last of the line, the man known as the Duc de Bourbon, who was the father of Napoleon's victim, the Duc d'Enghien, and the Duc d'Aumale's godfather. It is to this fortune that a scandal attaches, arising from the mysterious circumstances connected with the death of the last of the Condés in 1830, a few days after the elevation of Louis Philippe to the throne, and the lawsuit that arose in consequence of his will in favor of the little Duc d'Aumale, in the decision of which it was believed at the time that the Judges had been influenced by members of the royal family.

The Duc de Bourbon's career had been a romantic and not at all a creditable one. At the age of 14 he had startled the French court by eloping with a Princess of the blood three or four years older than himself, the Princess Bathilde of Orleans, sister of Philippe Egalité, and, therefore, aunt of Louis Philippe. They were married, but quarrelled in a few years, after the birth of a son, the Duc d'Enghien, whom Napoleon had shot in the ditch of the château of Vincennes in 1804. The Duc de Bourbon, who retained that name till late in life owing to his father, the Prince de Condé, living to be a very old man, entered upon a course of dissipation that scandalized a corrupt court, and that lasted till the outbreak of the Revolution. It was even believed that he lacked personal courage, although he fought a sensational duel with the Comte d'Artois, who was later King Charles X., because the Comte had crushed the Duchesse de Bourbon's mask on her face at the opera ball on Mardi Gras. This was after the Duke and Duchess had separated. The Duchess later took up religion, making herself conspicuous by marked eccentricities.

The Duke went into exile at the Revolution, and after the Bourbons were restored was one of the most greedy and successful claimants for compensation. He was then childless and had formed a connection with a beautiful English adventuress, who acquired very great influence over him. She was then a woman of twenty-two; her name was Sophie Daw, or Dawes, or Clarke, all three names being used by her in official documents. She was said to be the daughter of a fisherman on the Isle of Wight and to have danced in the ballet at Covent Garden. The Duc de Bourbon had her educated and then married her to the Baron de Feuchères, his equerry and formerly an officer in the French army. Besides very large gifts from the Duke, she received from him on her marriage an annuity of 72,000 francs. Her husband at first was ignorant of her relations to the Duc de Bourbon and believed that the latter's interest in her was due to her being his illegitimate daughter. When he found out the sort of woman he had married he obtained a separation, after a public row with the Duke. Mme. de Feuchères, who continued to live in his palace, induced the Duke to show great liberality to her relatives; he married off her niece to a French Marquis, giving her a dowry of 1,000,000 francs; to a nephew he gave an estate and a sum of 200,000 francs and obtained for him the title of Baron.

Mme. de Feuchères was shrewd enough to understand that any will made in her favor by the Duke, who had now become by his father's death Prince de Condé, would be contested by his relatives. She looked around for allies and found them in the Orleans family, the Duchesse Marie Amalie with all her bourgeois virtues having also the bourgeois covetousness. She did not hesitate, it seems, to make use of this adventuress in influencing the old Prince de Condé to adopt his little godson, the Duc d'Aumale, and kept up a correspondence with her for three years. The price paid was the assurance to Mme. de Feuchères that she would be able to keep the 10,000,000 left to her in the will that turned over the bulk of the inheritance to Louis Philippe's son. This will, dated Aug. 29, 1829, was offered for probate after the Prince's death. The Prince de Condé was much alarmed by the July revolution, which drove out Charles X. He made preparations to leave France and join the exiled King in England at the end of August, 1830. On Aug. 26, fifteen days after the Duke of Orleans had been proclaimed King of the French, the old Prince went to bed in his Château of Saint Leu apparently in his usual health. The next morning he was found hanging from the catch of his bedroom window by two knotted handkerchiefs tied around his neck, his knees bent, and his toes touching the ground, but in such a manner that if he had simply stood up straight he would have escaped death. People declared at once that he had been murdered by Mme. de Feuchères or her agents and placed where he was found after death. The court, however, accepted the theory of suicide, and refused to allow a criminal accusation to be lodged against Mme. de Feuchères, removing at least one overzealous official who wished to prolong the inquest. When the will was presented for probate the contestants, among whom were the Princes of Rohan, asserted that it was a forgery contrived by the adventuress, and that if genuine it was procured by undue influence, and many people believed the son of Philippe Egalité to be capable of anything in order to obtain money. Judgment was given in favor of the will, and there were loud mutterings of improper influence.

So far as the will concerned the Orleans family, however, there seemed to be no reason for objection to it, the Orleans family, by marriages for several generations back, being most closely connected with the Condés. So long as the will was in doubt Mme. de Feuchères was protected by the royal family. After the decision in their favor, however, she had cause to complain of the manner in which she was treated, and brought suit unsuccessfully for the delivery of some portions of the Prince de Condé's legacy to her. She died unnoticed in 1840. Though the Duc d'Aumale has made good use of the fortune thus acquired, the possession of Chantilly has been looked upon by the superstitious as a source of ill luck. It came to the Condés through the heiress of the Montmorencys after the last males of her family had perished on the scaffold. The tragic fate of the last Prince of Condé and of his unfortunate son, the Duc d'Enghien, was made to turn somehow on its possession, and the Duc d'Aumale himself died childless. His two sons, who took their titles from this great inheritance, the Prince de Condé and the Duc de Guise, each died as he was entering on manhood. Chantilly, with all its treasures, by an arrangement made ten years ago, goes to a corporation which it cannot harm, the Institute of France. The rest of the Duc d'Aumale's fortune will probably be divided among the different members of the house of Orleans, although it is likely that his grand nephew, the Duke of Orleans, the head of the house, will get the lion's share. All the preparations for a reconciliation between him and the Duc d'Aumale had been made when the latter died so suddenly, and in spite of his adhesion to many of the changes in republican France, the Duc d'Aumale never ceased to be a reactionary and a Legitimist in politics.

The Jury Awarded Him a Wooden Leg.

From the Oregonian.

A novel verdict was returned by the jury last night in the damage suit of Lee A. Donaugh vs. the City and Suburban Railway Company. The jury decided that the company pay the costs of the suit, furnish Donaugh with a wooden leg, and also give him employment.

Donaugh was a motorman on car 33, and lost his left foot by having it caught in the gearing or cogwheels of the motor while engaged in "cutting out." He claimed the gearing should have been protected with casings, and that the company was negligent in not having them on the car. The defendant alleged that the use of casings had been done away with some time before the accident, and that they were not a protection when they were in use, but were to prevent the accumulation of dust, and failed to accomplish this, and on the contrary caused it to gather. Donaugh was injured, they said, by his own carelessness, as he could see what he was doing.

Donaugh sued for $15,000 damages. At two former trials the juries disagreed.

Bought $170,000 Worth for $6.

From the Philadelphia Times.

BURLINGTON, Ia., May 18.—George W. Stone, a Burlington commission merchant, became a rich man in almost a minute's time. He was the successful bidder for the unknown assets of the Burlington Insurance Company, which recently failed. The unknown assets were offered for sale in one lump. It was bid off by Stone for $6. The assets have now been discovered to be worth $170,000.

MANHATTAN'S TANK SAFE.

HOW COULD THE COMPANY RUN A BANK WITHOUT A WATER WORKS?

Elm Street Widening Comes Within an Ace of Staving In the Watery Source of a Wall Street Institution's Perpetual Charter to Do About Anything It Likes That's Lawful.

The widening of Elm street will come within an ace of hitting the famous charter tank of the Manhattan Company, which owns the Bank of the Manhattan Company at 40 Wall street. The Manhattan Company, as old New Yorkers know, was organized in 1799, in opposition to the Bank of New York. The Bank of New York then had been in operation some fifteen years without a rival, had had many dealings with the Government, and was the most formidable institution of the day. The Manhattan Company was a project of Aaron Burr and the securing of the charter for the banking part of its business was due to the craft of that gentleman. The Legislature would not grant a charter for an opposition bank, but New York city wanted a water supply. Burr concealed his real object and drew up a charter for a company the ostensible purpose of which was to furnish to the city of New York an adequate supply of pure water. It didn't say where the water was to be obtained, but all the time the charter was under discussion it was the understanding that pipes were to be laid from the Bronx River. The eighth clause of this charter to supply New York with water read:

"And be it further enacted that it shall and may be lawful for the said company to employ all such surplus capital as may belong or accrue to the said company in the purchase of public or other stock, or in any other moneyed transactions or operations not inconsistent with the Constitution and the laws of this State, or of the United States, for the sole benefit of the said company."

The authorized capital of the company was $2,000,000. Digging wells and laying water mains was cheap in those days, and it didn't take a great deal of the company's capital to start all the water works that the company proposed to start. Instead of going to the Bronx, the company sunk a large well at what is now the corner of Reade and Centre streets, in a thickly populated part of the city, and pumped water into a reservoir in Chambers street. From there the water was distributed through hollow logs.

The bank was organized quicker than the water works. The charter the company got from the Legislature was perpetual, but as only the surplus capital over and above that required to operate the water works could be used, of course it was necessary to keep up the water works. The city bought water from the company for about thirty years. It hasn't bought any since; but in order to keep the company's charter going the water works had to be maintained.

The works are in an unpretentious yellow building which stands at Duane, Reade, and Centre streets. The building is occupied by several concerns in the hardware business, but more than two-thirds of it is taken up by a huge tank forty feet in diameter. This tank and a little engine, which pumps a diminutive stream of water into the tank, are the water works of the Manhattan Company. The engine works fourteen and fifteen hours a day, and when the water in the tank gets to a certain height it runs off into a cistern. The building is three stories high and the tank stops at the level of the third floor.

As originally planned Elm street was to continue on its present line to Chambers street. But if that plan had been followed, to widen it would have necessitated the destruction of the expensive building put up a year or so ago by the Edison Electric Company. So the line was changed, and it is to meet Centre street at the junction of Centre, Reade, and Duane. To get it through there it is necessary to chop off a great big piece of the building in which the Manhattan Company's water works are. The tenants of the building have been in a state of mind ever since the new line was decided upon over what was to happen to the tank. If that was interfered with, of course the whole building would have to go. The Street Improvement engineers have had their men at the building several times, and they have made all sorts of measurements, most of which have contemplated the cutting off of a slice of the tank about two feet wide.

A SUN reporter looked up all the maps yesterday. There are three or four of them, but only one official one. The unofficial ones run the new street line right through the northeastern side of the tank. The official one puts it about a foot or a little less away from the tank. It would appear that if this line is followed the Manhattan Company's charter is safe.

The tank is built of stone and brick half way up, and the rest of the distance is iron. It's a mightly homely water tank and the water in it doesn't smell just exactly right. Of course, when the street is widened, a new wall will have to be built around the tank for the sake of appearances, and it will be mighty close squeezing to get one in the little space left between the tank itself and the new line of the street.

AQUARIUM STRUGGLES FOR LIFE.

Ways in Which Killies Fed to Larger Fishes for a Time Evade Pursuit.

When live killies are put in an aquarium tank as food for larger fishes they dart off through the water trying to escape. Most of them, however, are soon captured and eaten; sometimes all. But sometimes a few escape for a time, and these use every means to avoid capture. It is a common thing for the killie to remain at the surface—there are fishes that do not like to take their food there where they must gulp in air with it. If the killie can get actually out of reach of the larger fish it does that; out into the shallow water on a shelving stone, or under stones, where the larger fish cannot follow it.

In such tanks as those at the New York Aquarium the killie may hug the smooth porcelained side of the tank. It is difficult for the larger fish to take anything from a smooth surface, where it cannot overlap the object, and a fish is also very shy about bringing its nose into contact with the wall. Apparently the killie knows these things, for it hugs the wall. And if one lying by the wall is taken away from it and put out in the centre of the tank it straightway returns to the wall again.

The killie gets into a corner, where it is yet more difficult to reach it; and if there is a jog or recess in the corner it gets into that, where to reach it is more difficult still. Sometimes a killie jumps up on the strainer. The opening into the overflow pipe from the tanks is guarded by a movable globe-shaped strainer of galvanized wire, which is in effect a little round knob projecting from the back of the tank. Perhaps a third or a half of the strainer is below the surface of the water. Sometimes a killie jumps out of water upon the strainer, and lies there curved over it, head down on one side and tail on the other. At its highest part the killie is out of water a distance about equal to its own length. It is like a man jumping up on a stoop to escape something dashing along the street.

The strainer is the most difficult place to reach, and the safest place for the killie when it gets there, but it couldn't stay there always, for sooner or later it would die if it remained wholly out of water. But wherever the killie may get it is pretty certain finally to be captured and eaten. The killie that hugs the wall or gets into the corners is pursued even there. The trout, for example, will come up to a killie that it cannot take into its mouth and nose the killie out, and the instant the killie takes to the open water it is lost. There it is no match at all for the vastly superior larger fish.

Sometimes a blackfish will swoop up and take a killie from the edge of a stone step upon which it is lying in an aquarium pool, in water so shallow that it is stranded. In nature a killie pursued by some larger fish, a blackfish, for instance, might find shelter under some little arch in a rock, the opening of which was not big enough for the blackfish to gets its head into. Then as likly as not the blackfish would settle down in front of the arch and wave its pectoral fins back and forth, apparently trying to set up a current to drive the killie out.

THE BOATS THAT CATCH THE HERRING.

Their Peculiar Rig—One of Them Sails from Cornwall to Australia.

The fleets of herring-fishing boats sailing out of the ports of Great Britain are grand seagoing craft, strong and swift, and able to stand the stormiest weather. They are usually rigged with two stumpy masts and carry enormous square lugsails, which have to be lowered and raised every time the boats "come about." In Scotland and the English and Irish ports they are called luggers, but in the Isle of Man have the local name of "nickies."

In many cases the crews own the boats, each man having a share; but in any case the fishermen have an interest in the amount of fish sold, and are paid according to results. It is a glorious sight to see these boats racing home after a good haul, the first boat in having the best market for the fish.

It is not uncommon at Tarbot, the headquarters of the Loch Frone boats, Peel, in the Isle of Man; Penzance, in Cornwall, and at some Irish ports to see the fish taken away by cartloads to be used by the farmers for manure at times when an unusually big catch has oversupplied the market.

In many places during the summer there are races organized by the townspeople and visitors for these luggers, and the interest in the events is far more keen than in the finest yacht races. Only recently a Penzance lugger was sailed by her crew to Australia, and made the passage in wonderfully quick time. The large boats are manned by from twenty to thirty men, the weight of the lugsails making a big crew a necessity. In most cases the sails are stained a reddish brown, and distinguishing letters and numbers on the sail tell to what port the craft belongs.