DAMS AND RESERVOIRS.

THE SCIENCE OF DAM BUILDING ILLUSTRATED BY EXAMPLES.

Americans Suddenly Bound to Great Interest in Good Dams—Many Towns in Danger—The Great Croton Lake Proposed. 50,000,000,000 Gallons.

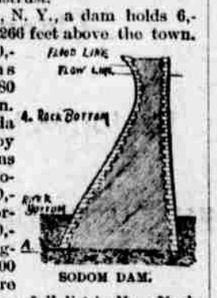
Never since America was settled by white men has there been such an overlooking of dams and fearful looking for of leaks or structural weaknesses as now. Next to the surprise of learning how very many towns there are in the mountainous sections which are overhung, so to speak, by great reservoirs, is the inquirer's surprise at the general knowledge of hydromechanics recently gained by the people.

THE BROKEN DAM.

Almost any man can tell you about the pressure of standing water or the force of running water, the cumulative force of percolation and the logic of Torricelli's theorem that the force of liquid jets is proportional to the square roots of the depths at which they issue below the surface. And the universal interest has brought out the fact that there are not only many dams of doubtful strength, but several very large ones are proposed or in course of construction as to which engineers differ seriously. New York and New England contain many dams standing at levels of from 1 to 300 feet above important towns. Most of these dams are much better built than was the fatal one at Johnstown, but some of them are weak affairs.

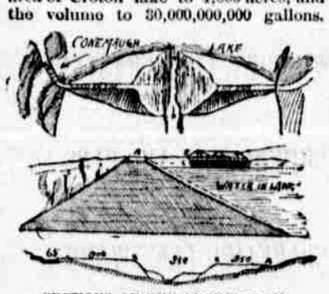
The noted dam of Croton river, the first completed to supply New York city, consists of two lines of stone cribs and ten feet of solid concrete between them; and as it controls a reservoir of but 400 acres, with 500,000,000 gallons of water, it may be considered as near absolutely safe as any structure in this world can be. It is forty feet high. The other dams of the Croton basin, including the Sodom dam, are thought to be equally strong; but the proposed Quaker Bridge dam, to control 30,000,000,000 gallons, excites much distrust.

At Whitehall, N. Y., a dam holds 6,000,000 gallons 266 feet above the town. At Norwich 30,000,000 gallons are massed 180 feet above town. Similarly Oneida is threatened by 22,000,000 gallons 180 feet high; Goshen by 46,000,000 gallons, Hornellsville by 50,000,000 and Kingston by 60,000,000 gallons. These are only specimens; a full list in New York alone, with the particulars, would fill a column. Of the largest reservoirs that above Troy holds back 600,000,000 gallons, and that above Utica 700,000,000. For the convenience of Hartford, Conn., there is a series of dams holding 1,300,000,000 gallons, and when the lower one gave way, in 1867, the 200,000,000 gallons poured out did great damage. All these, and indeed all other dams in the United States, seem insignificant compared with either of the big dams proposed to secure New York city against all possibility of drought.



SODOM DAM.

The greatest, and meant to be the greatest in the world, is the Quaker Bridge dam, which would increase the area of Croton lake to 4,000 acres, and the volume to 30,000,000,000 gallons.



SECTIONS OF THE BROKEN DAM.

The Mississippi at Hannibal City is exactly a mile wide at ordinary level, and this proposed reservoir would maintain the river volume and current there for over two hours. The giving way of such a dam, the sweep of such a mass of water down the narrow Croton valley and its sudden addition to the Hudson are not to be thought of without a shiver. It would, so some calculators estimate, send a tidal wave down that stream which would crush most of the shipping and sweep away all the docks on that side of New York, then, after swelling the bay and concentrating again at the pass, would tear out Sandy Hook and sweep its sands into deep ocean. The promoting engineers smile and say there need not be the slightest danger.

They propose that the dam shall be 1,500 feet long, 274 feet high, 216 feet wide at the base and 22 on the top, and so constructed as to sustain twice the pressure of the 120,000,000 tons of water, the most that can accumulate. Their specification is, briefly, solid masonry laid in hydraulic cement, with ample overfall in the center. Nothing can injure it, they say, but an earthquake, and that could only produce cracks in the masonry, through which the waters would escape slowly, the base being too great for the dam to topple down. In proof they cite the old Spanish dams at Puentes, Alicante and Val Del Inferno, and the French dams at Vilfars, Ternay, Hamiz and other places. One-third of this dam would be below the natural bed of Croton river, as it is that far to solid bed rock.

The opponents of this scheme have a good deal to say. One suggests that an Anarchist or alien enemy could carry enough dynamite in a gripsack to blow a breach through the dam. Another maintains that the pressure would be so great that the water would insinuate itself into the pores of the masonry or bedrock and eventually undermine the dam. Still another insists that owing to the peculiar formation at that point the pressure would be greater than was ever yet brought upon solid masonry, and that a break would be probable. Professor Hogan, who testified as an expert before the aqueduct commission, replies to all this that stone dams always break in portions, while earthen dams often go in a body; hence, if a breach were made and successive sections of the dam carried off by the force of the water, there would still be ample time for a slow discharge.

The basis principle of the science is that water presses, not according to its breadth but its height; the tin of the spout sustains just as great a pressure as the tin around the coffee pot. This and the rise of water to its level have been understood in all civilized times, and some famous instances may be cited from Rome to England, the most remarkable perhaps being that of the supply of Liverpool from a distance of seventy-seven miles. This aqueduct is the longest that has ever been constructed. It even excels the famous Claudian aqueduct built by the Romans, which had a length of thirty miles. It will supply Liverpool daily with 40,000,000 gallons of water—much more than is needed for a long time to come, notwithstanding Liverpool has at present a population of over 800,000.

PROPOSED QUAKER BRIDGE DAM.

The aqueduct commences in northern Wales, high up in the mountains, where, crossing the upper part of the Vyrnwy valley, an immense dam has been erected to collect the water of the river which gives the name to the valley. The lake is four and three-fourths miles long and half a mile wide. The area covered by it amounts to 1,121 acres. The city of Liverpool had to buy the village of Llanwyddin, together with the church parsonage and cemetery, before the work could be commenced, and where for centuries generation after generation had spent their lives, the waves are now curling under the influence of the breeze. The greatest depth of the lake will be 84 feet, and the waters here collected will amount to 12,131,000,000 gallons. This artificial lake is the greatest lake which Wales possesses. The length of this giant dam which closes up the valley is 1,172 feet. At the base it is 120 feet wide. The height from the foundation to the carriage road on top is 161 feet; from the bed of the river, 101 feet. The dam contains not less than 260,000 cubic yards of masonry, which weighs 509,700 tons.

Before the water leaves the lake it is carefully filtered in a tower 160 feet high. For miles the water must be conducted subterraneously under rivers, lakes and hills. Then again, when the topography requires it, the water must be lifted by hydraulic pressure and siphons. Between the Vyrnwy lake and Liverpool there have been built for this purpose a number of reservoirs, which can contain immense masses of water, so that even if there should be an obstruction at the commencement of the aqueduct Liverpool would not suffer any interruption in its water supply. An important part of the aqueduct is the tunnel under the river Mersey, which is 900 feet long. On the left side of the river the water is conducted in steel pipes down a shaft 68 feet long into the tunnel to ascend again on the right side in similar pipes for 104 feet. From there the water will go into the basin from which takes place the distribution over Liverpool.

The cost of this gigantic enterprise, which is justly designated a triumph of modern engineering, will probably amount to over £4,000,000—$20,000,000. The proposed Quaker Bridge reservoir for New York city would exceed this in volume of water, but the engineering difficulties would be much less. The weight of opinion among the best engineers is that the scheme is perfectly practicable and the dam could be made perfectly safe.

It should be noted that the dam above Johnstown, though a rather poor earthen affair, did not "burst," as the common phrase goes—it wore or washed away

after the water began to pour over the top. If there had been the thinnest "skin" of masonry, or even of wood, over the top, to carry the overflow so far that it would not undermine, the dam would have stood. The lesson of all such cases is that the wasteway is the thing to look carefully to, no matter how low the dam is, if it is of earth. The Johnstown dam was strong enough, but it had no safe wasteway.

RUSSIA'S GREAT FLOOD.

Frightful Scenes When the Neva Overflowed Its Banks.

[Special Correspondence.]

NEW YORK, June 13.—The flood that overwhelmed St. Petersburg was not quite so terribly sudden as this Conemaugh one, but it was fully as destructive, and to this day you may see on many of the great Russian public buildings a red line, with the date "7th November, 1824," marking the height of the water on that fatal morning. For three days previous the waters of the Neva, swollen high by a sudden thaw, had been driven back by the furious west wind that was blowing with ever increasing violence up the Gulf of Finland; and as the river rose, the alarm guns kept booming through the howling storm all night long from the citadel, while through the darkness the red glare of signal lanterns lit up every watch tower. A few took fright and fled with what property they could save, but the greater number stayed and met their doom.

Just at daybreak on the morning of the fatal 7th those whose houses looked down upon the great open space of the Admiralty plain (which flanks the river) were awakened by a hollow rumbling like distant thunder, and soon the solid ground below them melted into a sea of leaping, glittering, foaming water, on which wagons, barges, casks, sentry boxes, bundles of hay and shattered timbers were whirled along like straws, together with drowning horses, men and oxen, whose cries swelled dismally the universal uproar. Then the three great canals burst their banks, and on went the flood in one mighty wave through every street and lane, till fully two-thirds of the city was under water.

And now the tragedy began in earnest. As the timber houses along the river bank began to shake beneath the battering strokes of the waves, the doomed inmates tried to clamber to the roof, mostly failing in the attempt and falling headlong into the raging waters below. Children sank before the eyes of their mothers, wives before those of their husbands. Many of the poor wretches, in the madness of their terror, fought savagely for a few inches of foothold till they were all engulfed together. Higher and higher rose the flood, house after house came crashing down, and the shrieks of those who were perishing beneath the ruins were heard above all the roar of wind and storm. And still the alarm bells pealed and the alarm guns boomed in the distance, as if calling in vain for the help that none could give.

But all at once a large boat was seen to come gliding around the corner of the Voznesenskaya Ooliza (Assumption street), rowed by eight strong men, and steered by the Czar Alexander himself. Just at that moment a huge mass of wood work, torn from some fallen house, bore right down upon the boat. A collision would have been certain death to all; but the czar saw that there were two children clinging to the drifting mass, and with one turn of the tiller he brought the boat alongside, and, at the risk of his own life, snatched the poor little waifs from destruction. Then, taking them on his knees, and wrapping his gold laced cloak tenderly around them, he went bravely on into the jaws of death.

Several other boats were soon at work and the men who guided them, steering close to the submerged houses, shouted to those at the windows and on the roofs to let themselves down. But so utterly unnerved were these poor creatures by mortal terror that many of them, instead of lowering themselves quietly into the hands of those who were ready to receive them, leaped headlong into the rushing waters and thus perished with safety actually within their grasp. One struggling woman was clutched by a brave fellow in the bow of one of the boats, but ere he could drag her in the skirt by which he held her gave way and she sank forever. A number of people who had taken refuge on a wooden roof were espied by a boat's crew, who ran alongside and were just shouting to them to lower themselves down, when the whole roof fell in with a horrible crash, overwhelming the rescuers and the rescued in one common ruin.

But the horror was not at its height even now. With the coming of night came a bitter north wind and a frost of unparalleled severity, which completed the deadly work that the flood had begun. Many who had escaped the waters died by the cold of that fearful night; and when morning dawned upon that wild scene scores of dead men were drifting through the dead city on broken planks or capsized boats, with their livid faces and sightless eyes turned blindly upward to the cold and cruel splendor of the wintry sunrise.

A few figures were seen clinging to the trees along the front of the Admiralty building, and the passing rescuers hailed them, but there was no reply. The boats were hastily run thither, and they were told to leap in, but not one of them spoke or moved—they were all frozen corpses. Nearly five hundred of these ghastly fruits were gathered from the trees of the various boulevards when the flood went down, and in many cases the stiffened fingers that still clutched the boughs broke short off like those of a statue!

How many lives were lost during that fearful day and night (which still stands alone in the memory of the Russian people like the burning of Moscow) can never be known now; but, apart from the multitudes that were destroyed in the capital itself, hundreds upon hundereds must have perished in Cronstadt and the low flat islets at the mouth of the river. Countless bodies were whirled away by the furious current of the Neva, to be found far out to sea by shuddering fishermen many days later; and, judging of the total havoc by the very small part of it which can be accurately reckoned, those few hours must have swept away many thousands of human lives.

DAVID KER.

PRACTICAL HINTS IN FLORICULTURE.

How and When to Water Plants—Necessity of Ventilation, Cleanliness and Sunlight.

The failures so often experienced in the cultivation of flowers are largely due to the fact that we try to do too much, that our gardens are too large and not sufficiently cared for. No one should have more ground devoted to a garden that can be kept in the highest state of cultivation. The same may be said of house plants or plants kept within doors during the winter. Too often do we see many plants crowded together in a poorly lighted window, compelling each plant to take on a form never intended by nature and foliage quite different from that desired by the owner. One of the chief requisites in management of house plants is plenty of sunshine. Next is an atmosphere neither too dry nor too close and a uniform temperature (lower at night than during the day).

Some practical hints as to watering have been recently summed up as follows by an authority in such matters: Rain water is better than spring or well water. Hard water may be greatly improved by adding a drop or two of ammonia or a little soda, a small nugget about the size of a pea to every gallon of water used. As to time of day, morning is the best, and next is the evening. Never water house plants when the sun is shining brightly upon them; the supply of water must be regulated according to the demands of the plant; the condition of the plant and of the soil is the best guide. Never give water when the soil is moist to the touch. Nearly all plants require more water when in bloom than at any other time, more in a warm temperature than in a cold, and more when in a state of active growth than when at rest. Plants in open rooms usually require water once a day, and some demand it twice, at any rate all should be examined with interest to water at least every day.

Cleanliness is essential. The leaves of plants should be kept free from dust, hence frequent washings are absolutely essential, although when watering never wet the flowers of a plant nor allow drops of water to stand on the leaves in the sunshine. Never allow water to stand in the saucers of the pots unless the plants are semi-aquatic. Watering is at least two fold. It supplies plants food or elements of fertility contained in itself, and converts the plant food or nourishment of the soil into a liquid form, so that it may be absorbed by the roots. The roots of a plant must be kept moist, not wet.

When the drainage is the most perfect plants will generally be the healthiest, and will need watering the oftenest. Give house plants as much light as possible during the day, and darkness with a lower temperature at night. Plants require rest; a uniform temperature of 60 or 70 degs. in the daytime and 40 to 45 degs. at night will give the best results. Turning the plants toward the light should not be done, unless done regularly. Besides light, house plants require a good supply of fresh air. Ventilation is absolutely necessary.

Two Views.

Flossy—Oh, mamma, see that man wheeling a baby carriage! I don't think a man should do that. Mother—Florence, you must not talk so foolishly. You will think differently when you grow up. —Lawrence American.

VOLCANIC HAYTI.

Facts on Its History and the Late Revolution There.

THE LONG NEGRO-MULATTO FEUD

The Lew Wallace-Beverly Tucker Commission—The Island of Santo Domingo in a State of Retrogression—Vaudoux Worship and Cannibalism.

The appointment of Beverly Tucker and Lew Wallace and almost immediate withdrawal of their names as United States commissioners to Hayti, followed by the news of Hyppolite's triumph over Legitime, has renewed public interest in that island. At the opportune moment appears the work of Sir Spenser St. John, who was for twenty years British consul general at Port au Prince and is now her majesty's minister in Mexico. His conclusions on Hayti are briefly and easily stated. He considers the island in a state of rapid decay, and the people as incapable of any form of government save despotism.

The people of the interior, he says, have reverted to the condition of a West African tribe, given over to the worship of Vaudoux (pronounced vo-doo, and often called Hoodoo in the United States), the sacred snake, and with the ceremonies of that worship go child murder, the digging up of corpses for their fat, the drinking of human blood mixed with rum, ferocious cannibalism, and the most disgusting debauchery.

A TALE OF HORRORS.

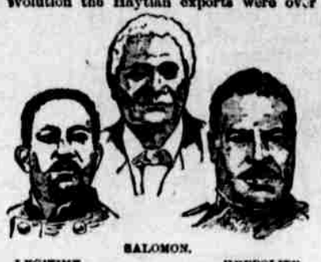
Such things should not be accepted without such testimony as excludes all doubt. Down to a few years ago the government tried from time to time to repress cannibalism, then the effort was abandoned, and the record of one of the last trials shows how common the practice was. In that case two of the guilty confessed, but the first evidence was obtained by a young creole who blacked himself thoroughly and mingled with the worshipers. The victim was a young girl. Sir Spenser St. John heard the trial, and says:

"She was thrown on the ground and held by the head and feet while the Papaloi (priest) cut her throat and let the blood run into the receptacle prepared. Jeanne cooked the flesh with Congo beans, but Roseide Sumera, urged by the fearful appetite of a cannibal, cut from the palm of the dead child a piece of flesh and ate it raw. (This I heard her avow in open court.) Asked which were the nicest parts of a child, she answered, laughingly, the palm of the hand and the inside of the leg."

Froude reopened the inquiry and confirmed the verdict of St. John. But this is too disgusting a subject to pursue. What concerns us more is the political condition and trade of Hayti. The island contains about 34,000 square miles, and Hayti is a little over one-third of it. The Spanish or eastern part is now called San Domingo, and the whole island Santo Domingo, and surely no other equal area has been in four centuries the scene of such wanton cruelty. When the Spaniards planted their settlement there (the first in the New World) the native Indians numbered at least 800,000; in forty years they had shrunk to 60,000. The men were literally worked to death in the mines. After 1560 no Indians are mentioned in the census, and as far as can be known there is not now a drop of Indian blood on all the island.

A BLOODY HISTORY.

Then came the "Brethren of the Coast," the noted Buccaneers, and seized the west part and finally delivered it to France, Spain retaining the other end. The French brought negroes from the west coast of Africa, and Hayti soon took rank as the richest colony in the world. At the outbreak of the French revolution the Haytian exports were over



SALOMON. LEGITIME. HYPPOLITE.

$45,000,000, chiefly to France. The white planters claimed a share in the French republic, the poor whites opposed the planters, the colored (mulatto) intrigued against both, and in due time the blacks rose against all three. The English came in and joined the blacks against the French and mulattoes. The horrors of the war can never be told. Political prisoners were bound between boards and sawed in two. Town after town was burnt and every person in it killed, regardless of age or sex.

At length arose the talented and humane Toussaint L'Ouverture, and succeeded in uniting the colored of all shades; 30,000 French soldiers died of yellow fever and the remnant surrendered to the English and left the island.

Toussaint declared a general amnesty and entered into a treaty with Napoleon Bonaparte; the latter had him captured and imprisoned him in a fortress in the Alps, where he died of cold and neglect.

MASSACRE OF THE WHITES.

The Haytians established a republic, and then began the long struggle between the pure blacks and the colored. On the first day of 1804 Dessalines was chosen president for life, and his first decree was an order to massacre all the French except the doctors and priests. Many were protected in the coast towns; of the rest not one escaped. Old and young, both sexes, the patriarch, the new born babe and nursing mother were beaten to death, tossed on pikes or hewed in pieces with cane knives. The news arrived that Bonaparte was made emperor. Dessalines immediately assumed the same title for Hayti, but as he was a black the mulattoes rebelled, and he was defeated and shot, having reigned not quite two years.

There was a year of war, then a new constitution was adopted, and Petion (mulatto) made president late in 1806. The blacks, led by Christophe, Riguad and others, revolted and there were five years of war. The country was then divided under five rulers, until Christophe consolidated the blacks and crowned himself as King Henry I. He was soon killed.

In 1816 a new constitution was adopted providing for a four years' presidency, and Petion was chosen, but he died in 1818—"not without suspicion of Vaudoux poison," says the mulatto historian.

Gen. Boyer was chosen to succeed and annexed San Domingo, thus reuniting the island. As president, protector, dictator and provisional general, he reigned many years; but San Domingo seceded, and so the Haytians drove Boyer into exile and the senate chose Gen. Herard-Riviere in his stead. Four months later there was another revolution and he fled to Jamaica.

The mulattoes now got control again and chose Gen. Guerrier president; but in a year he died of debauchery.

MASSACRE OF THE MULATTOES.

There was a short, sharp fight; the mulattoes were beaten and the blacks made Pierrot president. In a year he fled from his own soldiers and Riche, another black, was chosen. In a year he died—early in 1847—the cause not being given in the histories. Capt. Soulouque, a full black and a Vaudoux worshiper, was then elected and in due time became the noted Emperor Faustin I. His whole reign was an orgy of revel, riot, murder and massacre. His policy was plain and explicit, and thus declared:

"Crush the mulattoes, they are the curses of the land. They hate their fathers and despise their mothers. They would sell us to the foreigners."

One by one, but rapidly, the rich and educated colored were destroyed, and in 1849, under pretense of a plot, he ordered a general massacre of the colored caste in Port au Prince. Many escaped to the shipping in the harbor and others were protected by the foreign ministers. The rest were butchered. He then declared war against San Domingo, but it proved a "war of races." The ordinary practice of the Haytian soldier was to shut his eyes, turn away his head and fire his piece once, then break for the nearest mountain, screaming "O, Jesu-Mario-Mamaloi! misericorde! misericorde!"

At length the Dominicans captured a detachment, and straightway mutilated every man in an unspeakable manner. Thereafter the Haytians ran without waiting for the first fire, the whole army of 11,000 being driven by less than 1,000 Dominicans.

MANY SUCCESSIVE REVOLUTIONS.

In 1852 Soulouque made himself emperor and created an extensive nobility. The supreme court protested, whereupon he had the chief justice and four associates shot. Five years of war followed, till the empire was overthrown. In 1858 a general amnesty was proclaimed, and to propitiate the friendly powers a mulatto, Geffrard, was made president. The leading blacks at once organized a conspiracy, and in seeking to attack Geffrard they killed his daughter. Sixteen blacks were caught in the grounds where it occurred, and as it was uncertain which one killed her, all the sixteen were shot.

A HOUSE IN HAYTI.

In 1861 Legros, a black general, rebelled. In 1863 Gen. Salomon rebelled. In 1863 the province of Gonaives rebelled. In 1864-5 all the north side rebelled. In 1866 all the regular army revolted and Geffrard fled to Jamaica. The blacks once more had full control and made Salnave president. He fought various opponents for thirty months and was then captured and shot, March 19, 1870, Nissage-Saget was inaugurated, and he served the constitutional term of four years, being the first and the last in Hayti to do that. Being re-elected, there was a rebellion, and he fled to Jamaica.

Gen. Domingue succeeded and briefly declared his policy thus: "White men have no rights in Hayti that Haytians are bound to respect." His tyranny soon became unbearable, there was a sudden outbreak, his official family and nearly all his close supporters were killed and he escaped with great difficulty to a British ship in the harbor. Boisrond Canal, a mulatto, was chosen president, and his competitor, Boyer-Bazilais, rebelled. The president fled to Jamaica.

THE LATE REVOLUTION.

The triumph of the blacks was now complete and they made the black Salomon president. He had a French Catholic wife (white), had lived in France, and knew what civilization was; he, therefore, tried to suppress the Vaudoux and restore the church in the interior, but soon had to abandon the attempt or lose the support of the blacks. He ruled with a rod of iron for a few years, but had to "walk the plank" finally like his predecessors. Then began the civil war lately in progress.

It began with the assassination of Thelemaque, candidate of the north, after which the senate chose Legitime president, and Hyppolite declared himself the avenger of Thelemaque and champion of the north. All this time the condition of the country has been steadily growing worse. One of the finest islands in the world is given over to barbarism and anarchy. The Haytian army appears like a burlesque—1,500 generals to less than 15,000 private soldiers. As the fine buildings left by the French decay the people domicile in huts. Vaudoux worship is displacing Christianity, and stealing the public money is so common that it is not considered theft. Such, according to impartial authorities, is the condition of Hayti.

HAYTIAN SOLDIERS.

SEATTLE STRICKEN FOR HER GOOD

Where Is the "Future Great City" of That Territory to Be?

The first dispatches telling of the great fire in Seattle, W. T., put the loss at $40,000,000, which was sheer nonsense to any one who knew the rather flimsy character of the city's buildings. The second estimate was $20,000,000, and the final summary of the official authorities is that the total loss may not exceed $10,000,000. This is quite reasonable, and one might safely add that much of this will be offset by the permanent advantage to the city—as rigid "fire limits" have been established and those who rebuild must do so with somewhat less combustible materials than pine. The late city had a rather odd appearance that respect; each solid block of stone and brick was surrounded by kindling wood buildings, and they all went together.

It is a sort of rule in new countries that three cities must be built on the same site (in America it is often by the same generation) before they get one that will stick, and this is peculiarly true of the Pacific coast. Lumber is very cheap, the climate is deliciously mild, there is really no need of thick walls as far as comfort is concerned—the man who has not "made his pile" is in too big a hurry, and the man who has is too lazy. It is almost impossible to make plain to an eastern man how very easy it is to make one's self comfortable in Oregon and Washington. A good roof is the main thing; that one must have, for a rainfall of only sixty inches a year is considered "scant" and forty inches an "alarming drought."

MAP SHOWING SEATTLE'S LOCATION.

It is a hackneyed subject, but as the question of suffering is raised a few facts may be given. The mercury at Seattle (modified, of course, by the salt water) rarely rises above 80 degs., and though ice occasionally forms "as thick as window glass," it is not common. If the people had been asked to name a time when the city could be burned with the least inconvenience and suffering, they must have chosen the time of the late fire—when the rainy season was past and before the hottest or dryest weather. Splendid order has been preserved.

The doubtful walls still standing were destroyed, and the labyrinthine region lately covered by frame dwellings will be laid out in regular squares and solidly rebuilt. The extraordinary statement is made by local dealers that $30,000,000 of outside capital has been offered for investment. Evidently many people have faith in Seattle.

It was thought that the population of Seattle was 25,000, and for that number the trade was enormous. Washington probably has more timber in the forest than any other equal area of the United States, and her mineral wealth is great, so the future of Seattle was considered secure.

It is often spoken of as a very new country, but in fact it has been tolerably well known for eighty years and the Spaniards realized its value two centuries ago. It is not generally known to the present generation that Oregon, including Washington and Idaho, was once an independent region, practically about as independent as Texas before its annexation, but not acknowledged by other nations as Texas was. However, the land grants and court decisions of the detached "state" were allowed to stand by the United States when it took the country and territorialized it.

WATER FRONT, SEATTLE.

Capt. Robert Gray, of Boston, sailed up the Columbia in May, 1792, and laid the basis for an American claim. Lewis and Clarke traversed the region in 1803-4, and in 1811 John Jacob Astor's men founded Astoria. In 1833 the Americans commenced going overland, and the independent state gave each family so large a tract that a land monopoly grew up. If one wants to find prophecies of the future greatness of Seattle he can find plenty of them in the reports of these old explorers and settlers. The only trouble was that they did not know where the "future great city" was to be, though all were positive one of the biggest cities of the world was to be in that region. And it was a perfectly reasonable belief.

James G. Blaine.

Mr. Blaine is still a handsome man, though the industrious newspaper men have tried their best to make him sick, old, decrepit, and even to kill him. It is true Mr. Blaine is very pale, and some physicians think they can see in his face indications of Bright's disease, but I had a talk the other night with Mr. Samuel Fessenden, of Connecticut, who is a close friend of the secretary's, and has been for several years. "Mr. Blaine is pale," said Mr. Fressenden, "but he is sound. To my mind he is no paler than he was five or six years ago, only his hair has recently become perfectly white and that greatly heightens the effect of paleness. From what I had read in the newspapers I concluded Mr. Blaine was looking very poorly, and I came down to Washington a few days ago expecting to see him in a bad way.—Washington Letter.

Lima Beans.

The Lima bean requires a richer soil than the ordinary dwarf bean, and will pay well for special attention. Most growers use poles for these beans which are entirely too tall. The crop is harder to secure from the tall poles, and the extra height is an absolute disadvantage since it encourages the upward growth of the vine and retards its fruiting. If poles are used at all, a height of five feet is enough. Before setting the poles run furrows with a plow where the rows are to be. In these furrows place the manure or commercial fertilizer, then with a crowbar set the poles firmly in the furrow four feet apart. Next throw a furrow to the row of poles from each side, leaving them standing in a ridge. Now, with a rake, dress this bed of earth into good shape, and around each pole plant four beans, eye downwards, and only just beneath the surface. The elevated ridge around the poles will heat up sooner than a flat surface, and the germination will be much more rapid. When the plants are fairly established pull up all but two to each pole, and give a little attention to starting the vines on the poles, as they frequently need to be tied at the beginning. But the best way is not to use poles at all. Set two or three stout posts in the line where the beans are to grow, and then stretch galvanized wire netting, four feet wide, from post to post, and plant the beans along the ridge about six or eight inches apart. The wire will furnish points to cling to from the start, and the bean plantation will look much better than with the poles.—Garden and Forest.

Sayings of Well Known Horticulturists.

As to the girdling of grape vines there are various opinions as to its effect; some saying that the fruit is inferior, others that it improves it. "For my part," says S. Miller, of Missouri, "I have observed little difference, but that it will mature the fruit earlier by a week or ten days, there is no doubt."

Among smaller plants, violets, cowslips, and primroses are best placed in beds by themselves, where they may receive partial shade. The primrose family is especially adapted for the rock garden where the plants form dense cushions of bloom, states George Ellwanger, of Rochester.

Secretary Ragan, of the United States Horticultural society, thinks American forest trees, as well as shrubbery, harder to domesticate, or bring under culture, than foreign species. But he also thinks them larger and hardier growers; less symmetrical, but bolder in outline.

A successful apple grower of Seneca county, N. Y., finds the Baldwin the most profitable variety. He plants forty feet apart each way, manures with wood ashes, and cultivates until the trees are eight years old. Sheep or swine are then turned into the orchard for pasture.

Thinning is of importance. Do not neglect it, if you would have early and good vegetables.

The Sorrel Horse.

Western Stockmen claims that there is no color on the horse which is so insensible to heat as the sorrel. There is seldom any coat so silky or responds so quickly to good grooming as the sorrel. But more important still, there is seldom any horse with such sound feet and limbs, or possessing the endurance of the sorrel.

Successive plantings of garden vegetables should be made so as to have a lengthened supply throughout the season. With sweet corn and peas this is especially necessary.

THE VALKYRIE IS SPRY.

BUT IS SHE SWIFT ENOUGH TO CAPTURE THE CUP?

Commodore Gerry's Opinion on the Subject—Dimensions and Characteristics of the Valkyrie—Why Was She Outsailed by the Yarana?—The Trial Races.

The natural result of the past three years' races between English and American yachts—a result that might be expected—seems at last to have come to pass. Each side has observed the advantages of the other's models and the defects of its own. Consequently a model involving the best points of both has been evolved, and is a common one to each of the contestants.

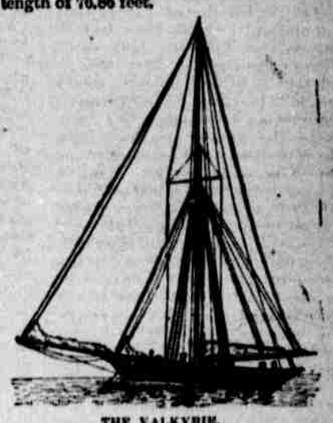
When the first of the international races which have excited so much attention during the past few years came off, there was a wide difference between the yachts. The English yacht was a cumbersome wedge, bearing some such relation to the yacht of today as an Eighteenth century coach would bear to a modern phaeton. The American yacht is best illustrated by the slang name given it—a skimming dish. She rode on the surface of the water and relied entirely on her centerboard for bracing against the wind. All the yachts of these models were abandoned as soon as the races were over, and the owners, whether winner or loser, betook themselves to preparing a better model.

Naturally the new boat evolved from all this experience favored the models of the winning yachts. It is the American type which prevails. Since the defeat of the Genesta the wedge model has been out of date in England, and as for the skimming dish style, it also has gone out in America. True, the American yacht of today still retains the centerboard, but the bottom is not nearly so flat as it was. The only perceptible difference between the national types today is that the keel in the latest type of English yacht, the Valkyrie, is a mere fin of iron to be used as circumstances may require.

Considering this similarity of model it seems quite likely that international races hereafter will not be so especially interesting as a test of model as of seamanship. The races will probably be much closer than formerly, and the danger of losing the America's cup far greater. This will render the contests more exciting, and if the cup goes to England, all America will be in a ferment until it is brought back again.

Here are the dimensions of the Valkyrie, which is to compete during the coming season, calculated from a photograph:

Mast, deck to hounds, 73 feet; topmast, 38 feet; spinnaker boom, 72 feet; main boom, 70 feet; from end of bowsprit to mast, 70 feet; overhang aft, 14 feet; overhang forward, 10 feet; bowsprit outboard, 34 feet; gaff, 48 feet. The measurements sent by Lord Dunraven to the New York Yacht club show her breadth to be 15.09 feet; depth, 11.6 feet, and load water line length, 69.9 feet. By the rules of the New York Yacht club this would give the Valkyrie a sail area of 8,208 feet and a racing length of 76.86 feet.



THE VALKYRIE.

There is nothing very definite in the trial races thus far in England. The Valkyrie, the Yarana, the Deerhound, the Irex, all met during the last of May in a number of races. In the first the Valkyrie came in five minutes by actual time ahead of any other yacht, but the race was won by allowance by the Deerhound. In the second race the Valkyrie easily defeated all competitors, and won the third, fourth and fifth races. All these were run in light winds. On May 28 and June 3 she raced again. On the former date she encountered a gale and lost the race, but is said to have suffered mishaps. On the latter date, in heavy winds, she was again beaten by the Irex and the Yarana.

Not having any more definite information as to the Valkyrie's model, and being too far from the scene of her trial races to understand the reason of her defeats or successes, there is little data to indicate the probable character of the coming international race. There are some who seem to regard the Valkyrie's defeat by the Yarana as a sign that the race will be a walk over for the American contestant; but Commodore Gerry has said it may fairly be assumed that "when the Valkyrie leaves England she will be the best yacht that ever did."

Coming American Congress.

The population of the United States is nearly one-half that of the whole continent, and in industrial and commercial strength the superiority of the North American republic over all of its neighbors combined is too apparent to need demonstration. It is on this account that some of the smaller states have shown a reluctance to join the conference, fearing they would be overshadowed and possibly their interests overwhelmed by the United States. Chili in particular has evinced evidence of suspiciousness and jealousy, but it is now likely that aggressive and almost dangerously ambitious republic will be represented. That there is no cause for these fears on the part of the lesser nations is shown by the fact that no nation is to have more than one vote in the congress, no matter how many representatives a nation may send.

Horticultural Notes.

The value of the California fruit crop this year is estimated at $24,000,000, of which fresh and dried fruits amount to $6,500,000 each, and raisins and citrus fruits $3,500,000 each.

In gathering early roots do it so that the roots may be thinned with as much regularity as possible, taking out the largest roots and giving the others a better chance to develop.

Everlastings is the name given to a number of different flowers that retain their form and color when dried. They will be in demand for Christmas decoration. Helichrysum is one of the best. It comes in various colors. See seed catalogues. Give plants an abundance of room, to allow them to branch freely.

The Industry gooseberry is generally considered a valuable acquisition.

Large crates about the shape of peach baskets are now made for green peas and string beans. They hold about as much as the old time square crates, and can be packed one in another, and thus returned in a less bulky form.