



(Copyright, 1900, by Frank G. Carpenter.)

SHANGHAI, Sept. 30.—Can China pay its war debt? This the powers would like to know. Each will demand satisfaction for the expenses it has incurred, and also a good round sum for the injury to its citizens. As to the war bill, the average will probably be \$100,000,000 apiece. This, including Germany, Russia, Japan, England, France and the United States, will foot up about \$600,000,000. The damage to the merchants at the various ports, the wrecking of the legations at Peking, and the destruction of the mission stations everywhere, including compensation for the lives of missionaries, will demand millions more. In fact, the powers will probably ask for about \$1,000,000,000, or just as much as Germany demanded of France at the close of the Franco-Prussian war.

Can China pay it?

Li Hung Chang says she cannot, and that she will have to give up territory instead. Li Hung Chang, however, is a Chinese official, a cog in the most corrupt political machine of the world—a machine that will have to be rebuilt if the Empire is to continue. He knows that a big national debt means the tearing of himself and his class from the machinery and the modernizing of the Chinese Government.

The truth is, the Chinese could pay the interest on a billion-dollar debt and not feel it. The present taxes are enough for all legitimate government expenses and 8 per cent on the debt three times that size. They have now a smaller debt than any of the great powers. It does not equal a dollar a head, and amounts to less than \$200,000,000. There are no local debts to speak of. The provinces are unencumbered and the cities and villages are unburdened; indeed, there is no country in a better financial condition.

As compared with the great powers, China is rich. England has one-tenth the people, and carries a debt 10 times as great; the debt of France is 10 times that of China, and the debt of the other powers are proportionately large. Here is what they are in round numbers: England owes \$2,000,000,000; France, \$2,500,000,000; Germany, \$2,000,000,000; while Russia has a debt of \$4,700,000,000. Austria-Hungary and Italy each owe eight times as much as the present national debt of China, and poor little Spain is paying interest on loans six times as great.

Have Horror of Debt.

The Chinese have a horror of debt. With their bankruptcy in a disaster. They pay their bills, settling all accounts at New Year. They especially dislike debts to foreigners, and it is the national policy to keep out of them.

Their first foreign loan was in 1874, when they borrowed \$500,000 at 4 per cent through the Hong Kong and Shanghai Bank. The loan was secured by the customs. Their chief debt was incurred after 1894, in order to pay the Japanese indemnity. During that year they borrowed 20,000,000 taels of the English on a 20-year loan. In 1895 they negotiated another English loan of about \$5,000,000 at 5 per cent to run for 20 years, and at the same time one of about \$80,000,000 of the Russians and French, to run 30 years, at 4 per cent.

In 1898 and 1899 they made two other loans of \$8,000,000 each of the Anglo-Germans, one at 4 and the other at 4 1/2 per cent. The first loan was to run 25 years, and the second 40. These and a few other very small loans, some of which are to pay the guaranteed interest on railway undertakings, comprise the total debt of this nation of 400,000,000 people, owning some of the richest agricultural and mineral lands upon earth.

No one knows what the revenues of China are. The taxes collected are enormous, but 70 per cent of them never get to Peking; the balance is either swallowed up in the form of bribes or presents to official superiors, or remains in the hands of the tax collectors.

There is no country so office-ridden. There is a class of men known as yamen runners connected with all government places, who are paid out of taxes and squeeze. It is impossible to tell what is collected. Accounts are rendered in piecemeal, and no province furnishes a balance sheet of its whole expenditure and revenue.

There is never a surplus and there are often deficits. No increase is ever reported. No one expects an increase, for he knows that if such a condition occurs the surplus will go into the collector's pockets. Indeed, the official figures of China are correct, the government revenue have been falling off, although in commerce, business and wealth the Empire has been steadily growing.

The revenue actually paid today are estimated at 75,000,000 taels. Call them even \$7,500,000, increasing thereby the estimate one-third, as the tael is not worth more than 30 cents. In 1893, the revenue were estimated at \$100,000,000. One hundred and fifty years later they approximated \$200,000,000, and still later Sir George Stanton estimated them at \$330,000,000. By the best figures attainable they are now somewhat as follows, in taels:

Sources of Income.
Imperial customs, 22,000,000; land tax, 20,000,000; salt tax, 10,000,000; opium, 15,000,000; native customs, 3,000,000; grain tribute, 5,000,000, and miscellaneous sources, 4,000,000, making a grand total of 79,000,000 taels actually received.

The taxes of the empire are collected by the board of revenue. This is one of the seven great departments of the government. It corresponds to our Treasury Department and has to do with all financial matters. It will probably have charge of the national debt, and all matters of indemnity will be laid before it.

The board of revenue is known as the Ho Pu. It has two presidents, one a Manchu and one a Chinese. It has four vice-presidents, and from six to eight directors. It has its superintendents, secretaries, assistant secretaries, comptrollers and clerks. It nominally levies all taxes and duties and pays all salaries and allowances. The ministers are under it, and it has charge of the imperial factories which are situated in different parts of the empire. One of its bureaus, that of the three treasuries, is devoted to the storing of the metals, stationery, silks and dyestuffs of the imperial family.

The board of revenue sends out once a year to each of the provincial governments a statement of the amount it is expected to furnish the general government. To this must be added the local taxes, the civil and military taxes, and then the rate is fixed. After receiving the estimate the Viceroy or Governor gives his directions to the different officials. In many cases the taxes are farmed out successively by the higher officials to those beneath them, and so on, until they reach the men who actually get the money from the people. It is from this collection of taxes that the Chinese officials are able to pay such high prices for their offices. The real salaries are practically nothing, but the percentages which they can hold back from the collections make the high places exceedingly profitable. Some years ago a collector of customs at Canton was expected to send about \$1,000,000 to Peking, whereas the annual receipts of his office were known to be over \$1,000,000. This man probably had a salary of a couple of thousand dollars a year.

The Chinese merchants of Hong Kong told Lord Roberts that mandarins have been accustomed to spend \$20,000 to keep up their establishments, and that viceroys who received but \$900 had often necessary expenses amounting to as much as \$75,000 a year. Notwithstanding this, such officials usually retired from their offices rich.

Only Big Stealing Count.

Moderate thievery in Government work is not considered dishonest. It is only when the steals are of enormous size that they create comment.

Take Ho-Kwan, for instance, who was one of the high officials of the Emperor Kien Lung. Ho-Kwan was a poor Tartar, who became an official of great wealth and power. When Kien Lung died the next Emperor feared him, and had him decapitated. His estate was confiscated and was found to be enormous. He had more than 200 strings of pearls and precious stones, and one of the pearls was bigger than any in the imperial crown. He had precious stones in the rough and diamonds made into buttons and also millions of ounces of silver and gold.

Take Li Hung Chang. No one knows how rich he is. He has bank stock, railroad stock and factory stock everywhere. I imagine he owns foreign bonds. His real estate possessions are large, and he has much in jewels. He wears a diamond button in his cap, the stone of which is as big as the end of your thumb, and he has many diamond rings. Sheng is said to be rich, and so in all probability is Kang Yi and the other close friends of the Emperor Dowager.

The land taxes of China could pay a big interest on three times any indemnity the powers will demand. More than this sum is annually collected, although out of it the Government gets only 20,000,000 taels. China is a big country, and a vast amount of it is cultivated. If half the cultivated land were taxed at 75 cents per acre the gross revenue would be more than 200,000,000 taels. Let us estimate it roughly at \$200,000,000.

Set aside \$25,000,000 instead of 20,000,000 taels for the Government and you have still \$175,000,000 to pay the expenses of collection, and in addition the enormous sum of \$150,000,000, or 4 per cent on a loan of \$3,750,000,000. The powers cannot ask more than one-fourth or at the outside, one-third this amount. The estimate of 75 cents an acre is very low, and this is on only one-half of the cultivated land. It shows you what a surplus China might have without the addition of a tenth of 1 per cent to her tax rate for government improvements, if her officials were honest.

The lands of China nominally belong to the Emperor, and all taxes come directly from the crown. The lands are chiefly held in clans or families. They are divided up into small tracts or farms, many of which are less than an acre in size. There is a thorough system of Government records. Real estate is bought and sold and the transfers are registered. The taxes are levied upon the lands, as

described in the government records, but the expense of transferring is so great that the ownership often passes without a government deed. The estate descends to the eldest son, the other sons having certain rights which must be satisfied before the ownership can pass. The daughters never inherit.

A part of the land tax is paid in kind and a part in money. The tax is estimated somewhat according to the amount under crops, and the farmers bribe the collectors to report less crops than they actually have, in order to escape taxation.

All money taxes are in silver, 95 per cent fine. There are bankers connected with the Treasury Department at Peking who pass upon the purity of the tax money as it comes in, and who are responsible for it.

A curious tax levied upon lands in China is the rice tribute. This comes chiefly from certain provinces in the Valley of the Yangtze. It was originally intended for the support of the Manchu soldiers in the capital, but a part of it now goes to other funds. The tribute amounts to about 104,000 tons of rice annually. This does not represent half the amount collected. In all the large cities there are imperial granaries built to store rice for times of famine and for the use of the soldiers. I saw rice barns at Nanking and elsewhere.

The rice fleet which carries this crop to Peking is of enormous extent. It is to be seen upon the grand canal, and it has its chief depot at Tung Chow, 12 miles from Peking. The rice tribute is handled by the transport department, and there are thousands of boats and junks engaged in carrying it from one place to another. The amount the government receives from it is said to be in the neighborhood of \$4,000,000 per year.

Salt Monopoly.
The manufacture and sale of salt is a government monopoly. The salt comes from sea water, there being evaporating ponds in the provinces near the sea. One of the largest is not far from the mouth of the Peiho. After the salt is made it is turned over to the Salt Commissioners. These men hand it over to those who have salt-selling licenses, and they farm it out to others.

The salt licenses are limited in number. They are perpetual, and are passed down from father to son. In a good district a license is often worth as much as \$10,000 a year. The government fixes the price at which salt is to be sold to consumers, so that the man who gets a contract makes as much as 35 per cent. Indeed, it is believed that the salt revenues could be greatly increased without increasing the cost of the salt to the people. At present salt costs only about 2 cents a pound at Shanghai, and not more than 2 cents a pound at Hankow.

The total government revenue from it, according to one authority, is \$10,000,000. It is estimated that the actual receipts are about \$5,000,000, and of this the merchants and middlemen make a profit of more than \$10,000,000.

The Chinese salt is not so fine as that sold in the United States. It is dark, porous and full of lumps. It is stored in salt warehouses, and you often see great hills of it near the large cities. It is piled there and covered with matting until needed for use.

Squeezing the Merchants.

One of the greatest squeezes in China is the likin tax. This is a tax on goods

in transit. It is collected along all the waterways of the Chinese Empire, and it fills the rivers and canals with little revenue boats, each equipped with soldiers and cannons. The officials thus guard the waterways and take their toll from every bit of merchandise that passes through them. The taxes are supposed to be fixed ones, but the officials make them a matter of bargain between themselves and the merchants. Some of the merchants unions pay lump sums to have their

goods escape likin taxes. The Shanghai Free Goods Club, for instance, has secured for its members a number of years. The little gunboats often blackmail the merchants, and they make all sorts of squeezes. No one knows how much money is collected under the plea of likin taxes. Mr. Jamieson, a former English Consul at Shanghai, estimates that about 15,000,000 of likin taxes annually flow to the public revenues. The amount actually collected probably is several times that which comes from the imperial maritime customs, or at several times 22,000,000 taels annually.

China has all sorts of queer taxes. The jinriksha men in Shanghai are taxed; the wheelbarrow coolies pay licenses, and there are licenses for pawnbroking, banking and goods selling. There are pawnshops in every town, which have to pay not only for the privilege of engaging in business, but an annual tax thereafter. In some cities the license costs as much as \$500, and the yearly taxes are from \$50 to \$100.

There are taxes on all land sales. The legal charge is 3 per cent on the money value of the transfer. Less than this is usually paid, because the parties to the contract put a less consideration in the deed than is received. There is a legal tax on mines, now amounting to nothing, but which may yield a large revenue when the country is opened up. There are export taxes and import taxes. There are taxes on silk cocoons, and, in fact, little taxes on many things.

There is a tax on opium imports which brings in about a million dollars a year, and one on the roads and railways which grow in the lowlands of the rivers. This stuff belongs to the government, and those who gather it must pay so much cash per bundle. There are quantities of roads in Manchuria, and also along the lowlands of the Yangtze Valley and elsewhere. They are sold for thatch and for fuel.

The reorganization of the empire will necessitate the employment of foreigners in nearly all places of trust. China cannot pay its debts without Europeans manage its tax collections. The only honest collectors in the empire today are the foreigners in the customs and the natives under them.

For some years the imperial maritime customs have been managed by Sir Robert Hart, who gets a salary twice as big as that of our President. He collects all the import duties, turning into the imperial treasury somewhere between twenty and thirty million taels a year. He has a large corps of officials, and his foreign clerks are the best paid men in Asia. They get big salaries, and every few years are allowed to go to Europe for a vacation, with their salaries paid. The members of the indoor staff can have two years' leave at the close of every seven, and those of the outdoor one year after every ten. Even the customs are managed along civil-service lines, and although Sir Robert Hart is the autocrat, everything goes by promotion and general efficiency.

FRANK G. CARPENTER.
ROMAN TABLE DELICACIES.
Queer Recipes Called From Earliest European Cook Book.

To the Romans belong the honor of having produced the first European cookery book, says a writer in Chambers's Jour-

nal. Although the authorship is uncertain, it is generally attributed to Caelius Apicius, who lived under Trajan (A. D. 110). Here are two recipes from this ancient collection:

"First, for a sauce to be eaten with boiled fowl, put the following ingredients into mortar: aniseed, dried mint, and hazel root; cover them with vinegar, and dates and pour in liquamen (a distilled liquor made from large fish which were salted and allowed to turn putrid in the sun), oil and a small quantity of mustard seed. Reduce all to a proper thickness with sweet wine warmed, and then pour this same over your chicken, which should previously be boiled in aniseed water."

The second recipe shows the same queer mixture of ingredients: "Take a wheelbarrow of rose leaves and pound in a mortar, add to it brains of two pigs and two thrushes boiled and mixed with the chopped-up yolk of egg, oil, vinegar, pepper and wine. Mix and pour these together, and stew them steadily and slowly till the perfume is developed."

The Romans were very fond of surprise dishes, such as pigs stuffed with live thrushes; and, to anticipate a little, this taste descended so near to our own times as the reign of Charles II, as witness a recipe of that date for making two pies which were to be served together—one containing live birds and the other live frogs. When the latter was opened, "you skip the frogs, which make the ladies shriek and skip," while the birds, when released, were to add to the general confusion by flying at the candles and putting out the lights.

A dish of peacock was a favorite plate at Rome, and was served at the beginning of dinner. The bird, having first been done to death by stifling, was then skinned, and the feathers fixed with the flesh of other birds, and the whole sewn together, and finally sent in to table affixed to a small branch as if alive.

Did He Get It—Well!
An ungroomed man slouched up to Ed P. Smith in Farnum street the other day and accosted him as follows:

"Say, mister, if I was to tell you that I wanted a quarter to get a square meal you'd think I wanted it to buy whisky, wouldn't you?"

CHINESE WOMEN WHEELBARROW PASSENGERS HIDING THEIR FACES FROM THE CAMERA.

The preliminary knowledge that the volcano is about to burst forth. There have been losses of life in the later explosions, but they were generally due to sudden accidents, such as the flow of lava, which killed 10 persons at the outbreak in the early '70s. At that time, from the report of the professors in the observatory, the inhabitants of Naples and other nearby cities knew that the eruption was coming, and that it would be possible for them to go up to the top of the mountain and view the outbreak. Ten persons who had taken advantage of

the opportunity were engulfed in an unexpected outpour of lava, and died a horrible death, says the New York Sun. Mount Vesuvius is the eastern extremity of a chain of volcanoes that reaches to the Island of Ichia. It is eight miles from Naples, on the eastern shore of the bay, which is thought to have been at one time the great crater of a volcano, and before the Christian era its volcanic activities were confined chiefly to the Island of Ichia. The base of Mount Ve-

lanius is more than 30 miles in circumference, and to the base of the cone the ascent is about 250 feet. The height of the summit varies in accordance with the condition of the volcano. Its maximum, taken after an eruption, was 4553 feet. The valley Arlio del Cavallo, separates the two cones by a distance of 700 feet.

The mountain has two peaks, called Somma and Vesuvius, at the present time, although there is ground for the belief that in ancient times it had but one. This took the form of a truncated cone, with an uninterrupted outline. The present cone is thought to have been formed by the eruption of 79 A. D. Although eruptions took place in 367, 472, 512, 683 and 957, it was not until 1631 that a flow of lava is reported. Then it flowed down to the sea. Formerly only ashes and scoriae had been ejected, and in the eruption of 97 the ashes were carried as far as Constantinople and to Tripoli. The

eruption of 1631 was the most violent, but continued for only seven hours. It again overwhelmed Torre del Greco, but as the weather was extremely cold, the lava soon cooled, and less damage was done than had been expected. In the middle of November, 1868, a cone about 70 feet in diameter, formed within the large crater during the preceding years, poured out a great flow of lava. Besides the principal flow from the big crater, there was a stream from an outside orifice 20 feet in diameter, and these rapidly rolled down the mountain. The crater also constantly projected into the air huge stones. This eruption continued until January, 1869.

It was on April 24, 1872, that the next great outbreak came. It had been preceded by warning tremors, and the greatest force continued from the first outbreak for ten days after.

The seismograph in the observatory has begun to show signs of agitation as early as 1871, and Professor Palmieri, in charge of the observatory, predicted an eruption. Cones formed during the year, and in the beginning of 1872. At this eruption 10 persons, who had come to the top of the mountain to see the beauties of the disturbance, were killed under the stream of lava that suddenly broke out from different parts of the mountain. Even the base broke open on this occasion, and the eruption was visible at so many points that Palmieri described the situation in these words: "Vesuvius sweats fire." From the time the manifestation began crowds of spectators came up from Naples and the other towns to witness the wonders of the explosion every night. The observatory stood between two ferocious vents so hot that the glass windows broke. Many persons fled from the observatory, and others who were perched upon the lava flow were killed.

The observatory on Mount Vesuvius was founded by Ferdinand II, in 1841, and under the charge of the famous physicist, Professor Palmieri. He was succeeded by Professor Luigi Palmieri. He was also a professor at the University of Naples. Professor Palmieri has had in the meteorological observatory on Vesuvius the opportunity to test the disturbances and the causes with the greatest accuracy, as the institution is supplied with the most delicate instruments. This is his theory as to the approaching eruption of Vesuvius.

"When the central crater begins to heave with slight eruptions, one may always predict a series of slight convulsions of greater or less duration, which are preparatory to the great explosion after which the volcano remains for the most part in repose."

Field of the Cloth of Gold.
A tale by minstrel told.
How they held a royal tournament
On a field of the cloth of gold.

Only Kings and Princes strive
And Knights of high degree,
For the base-born churl might not come
In the ranks of chivalry.

And the story echoes still
From those far days of old,
Though they are dust who rode the lists
On the field of the cloth of gold.

Here in a hapless age,
And in a wide, free land,
Where rank on rank, like soldiers tall,
The tawny cornfields stand.

A million sunflowers spread
The glorious fold on fold,
To make the wool and to weave the web
Of a field of the cloth of gold.

Woven of earth and air,
Star dust and burning noon,
A gleam of yellow flame by day,
Pale gold in the argent moon.

Along the burning slopes,
Wide to the Autumn sun,
As bright in hue as Danae's robe
And rich as silk upon.

A million sunflowers spread
Their golden, fold on fold,
To make the wool and to weave the web
Of a field of the cloth of gold.

—Louise A. McGaffey in Chicago Post.

CHINESE FINANCIERS RECKONING REVENUE RETURNS.

The excellent views of the Holland to peddle-bots at Newport shows that her efficiency has not been at all overrated by her inventor. The United States navy have had this terrible engine of war as potential in its effect on the imagination as in its effect on the sides of hapless man-of-war, long ago, had a hidebound bureaucracy held the man's view of the world.

As it is, says an exchange, the submarine boat is winning all along the line both here and abroad, and even the most conservative of bureau officials have recognized the new situation.

The mountain has never been entirely quiet since that outbreak. It has from time to time broken into eruptions, emitting steam, dust, and scoriae, and less frequently lava. The eruption of 1770 was

one of the grandest in the history of the mountain. Great clouds of white vapor floated above the crater, and into the distance were thrown pieces of stone, bery matter and masses of molten rock. Torre del Greco, at the foot of the volcano, which had been rebuilt after the eruption of 1581, was again destroyed in 1774 by the flow of lava from the mountain at that time. The new crater formed by the explosion of 1872, which continued through out almost the whole month of October, is three miles in circumference and about 1000 feet deep. In 1855 there was an eruption that nearly surrounded with lava some of the dwellings near the base of the mountain. The explosion in 1861 was very violent, but continued for only seven hours. It again overwhelmed Torre del Greco, but as the weather was extremely cold, the lava soon cooled, and less damage was done than had been expected. In the middle of November, 1868, a cone about 70 feet in diameter, formed within the large crater during the preceding years, poured out a great flow of lava. Besides the principal flow from the big crater, there was a stream from an outside orifice 20 feet in diameter, and these rapidly rolled down the mountain. The crater also constantly projected into the air huge stones. This eruption continued until January, 1869.

It was on April 24, 1872, that the next great outbreak came. It had been preceded by warning tremors, and the greatest force continued from the first outbreak for ten days after.

The seismograph in the observatory has begun to show signs of agitation as early as 1871, and Professor Palmieri, in charge of the observatory, predicted an eruption. Cones formed during the year, and in the beginning of 1872. At this eruption 10 persons, who had come to the top of the mountain to see the beauties of the disturbance, were killed under the stream of lava that suddenly broke out from different parts of the mountain. Even the base broke open on this occasion, and the eruption was visible at so many points that Palmieri described the situation in these words: "Vesuvius sweats fire." From the time the manifestation began crowds of spectators came up from Naples and the other towns to witness the wonders of the explosion every night. The observatory stood between two ferocious vents so hot that the glass windows broke. Many persons fled from the observatory, and others who were perched upon the lava flow were killed.

The observatory on Mount Vesuvius was founded by Ferdinand II, in 1841, and under the charge of the famous physicist, Professor Palmieri. He was succeeded by Professor Luigi Palmieri. He was also a professor at the University of Naples. Professor Palmieri has had in the meteorological observatory on Vesuvius the opportunity to test the disturbances and the causes with the greatest accuracy, as the institution is supplied with the most delicate instruments. This is his theory as to the approaching eruption of Vesuvius.

"When the central crater begins to heave with slight eruptions, one may always predict a series of slight convulsions of greater or less duration, which are preparatory to the great explosion after which the volcano remains for the most part in repose."

Field of the Cloth of Gold.
A tale by minstrel told.
How they held a royal tournament
On a field of the cloth of gold.

Only Kings and Princes strive
And Knights of high degree,
For the base-born churl might not come
In the ranks of chivalry.

And the story echoes still
From those far days of old,
Though they are dust who rode the lists
On the field of the cloth of gold.

Here in a hapless age,
And in a wide, free land,
Where rank on rank, like soldiers tall,
The tawny cornfields stand.

A million sunflowers spread
The glorious fold on fold,
To make the wool and to weave the web
Of a field of the cloth of gold.

Woven of earth and air,
Star dust and burning noon,
A gleam of yellow flame by day,
Pale gold in the argent moon.

Along the burning slopes,
Wide to the Autumn sun,
As bright in hue as Danae's robe
And rich as silk upon.

A million sunflowers spread
Their golden, fold on fold,
To make the wool and to weave the web
Of a field of the cloth of gold.

—Louise A. McGaffey in Chicago Post.

CHINESE TAX COLLECTORS.

The observatory at the base of the mountain enables the scientific experts to tell what the condition of the interior of the crater may be and the preliminary signs of an explosion are unfailingly indicated by means of the delicate instruments invented to mark the phases of the volcano. The observatory has now existed for 61 years, and the predictions of past eruptions have been verified. Nowadays the explosions of Mount Vesuvius are not accompanied with the disastrous consequences they were usually supposed to bring, and this is in a large measure the result of

the mountain has significantly increased in size during the past century and a half, chiefly by means of the lava which is so frequently ejected. Some of these lavas are so liquid in character that they flow readily down the sides of the mountain to the sea, while others only move an inch or two forward during several years. When the lava flows slowly down, as it did in 1832, it becomes wrinkled and folded, or twisted like ropes on the chilled surface, from the effects of the warm lava underneath. When it rolls down quickly, as in 1872, after that noted explosion, it is broken into great edges of the appearance and character of cinders. The greatest flow of lava ever noticed in any of the eruptions came in 1774, when the stream that flowed down the mountain was estimated to contain more than 40,000,000 cubic feet of lava, and reached to the sea in a mass 15 feet high and 1200 feet wide. It can readily be seen how destructive such a phenomenon would be.

Eruptions in the present century have been those of 1804, 1805, 1806, 1812, 1813, 1817, 1820, 1822, 1823, 1831, 1834, 1835, 1841, 1842, 1847, 1849, 1850, 1852, 1853, 1855, 1856, 1857, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900.

For nearly 500 years after the historic eruption of 79, which destroyed Herculaneum, Pompeii and Stabiae, Mount Vesuvius was comparatively inactive. The historians occasionally mentioned explosions, but few particulars are given, and by the end of the 17th century the mountain had come to look as it was in the times of Pliny, before the eruption of 79. The walls of the crater, five miles in circumference, were overgrown with trees and vines, and at the base were broad plains on which cattle grazed. The central tract was a lower plain covered with loose ashes and dotted with pools of hot, watery water. The eruption of 1861 was the more unexpected as it was thought that no danger was to be anticipated from a mountain thus covered with foliage and affording pasture to the flocks of the shepherds who lived on its slopes. It began on December 14, and had been preceded by earthquakes recurring intermittently during the preceding six months. The violent volcanic outbreak came on unexpectedly, as the instruments now kept in the observatory to tell the condition of the volcano were, of course, not at that time in existence. The eruption continued until February, 1862. During this violent and continued outbreak the cone lost so much of its height that it was 1500 feet lower than Somma. Great clouds of dust and smoking were belched from the crater, and some of these were carried, so strong was the force of the eruption, as far as Constantinople, and fell into the Adriatic. The clouds of steam that constantly flowed up from the crater condensed, and formed, with the dust, hot and muddy streams that flowed down the sides of the mountain. The flow of lava that came from the open as-

pects in the mountain ran into the sea at 13 different points. This eruption nearly destroyed the towns of Torre del Annunziata, Torre del Greco, Resina and Portici, and in spite of the warnings of the earthquakes 15,000 persons lost their lives through it.

The mountain has never been entirely quiet since that outbreak. It has from time to time broken into eruptions, emitting steam, dust, and scoriae, and less frequently lava. The eruption of 1770 was

one of the grandest in the history of the mountain. Great clouds of white vapor floated above the crater, and into the distance were thrown pieces of stone, bery matter and masses of molten rock. Torre del Greco, at the foot of the volcano, which had been rebuilt after the eruption of 1581, was again destroyed in 1774 by the flow of lava from the mountain at that time. The new crater formed by the explosion of 1872, which continued through out almost the whole month of October, is three miles in circumference and about 1000 feet deep. In 1855 there was an eruption that nearly surrounded with lava some of the dwellings near the base of the mountain. The explosion in 1861 was very violent, but continued for only seven hours. It again overwhelmed Torre del Greco, but as the weather was extremely cold, the lava soon cooled, and less damage was done than had been expected. In the middle of November, 1868, a cone about 70 feet in diameter, formed within the large crater during the preceding years, poured out a great flow of lava. Besides the principal flow from the big crater, there was a stream from an outside orifice 20 feet in diameter, and these rapidly rolled down the mountain. The crater also constantly projected into the air huge stones. This eruption continued until January, 1869.

It was on April 24, 1872, that the next great outbreak came. It had been preceded by warning tremors, and the greatest force continued from the first outbreak for ten days after.