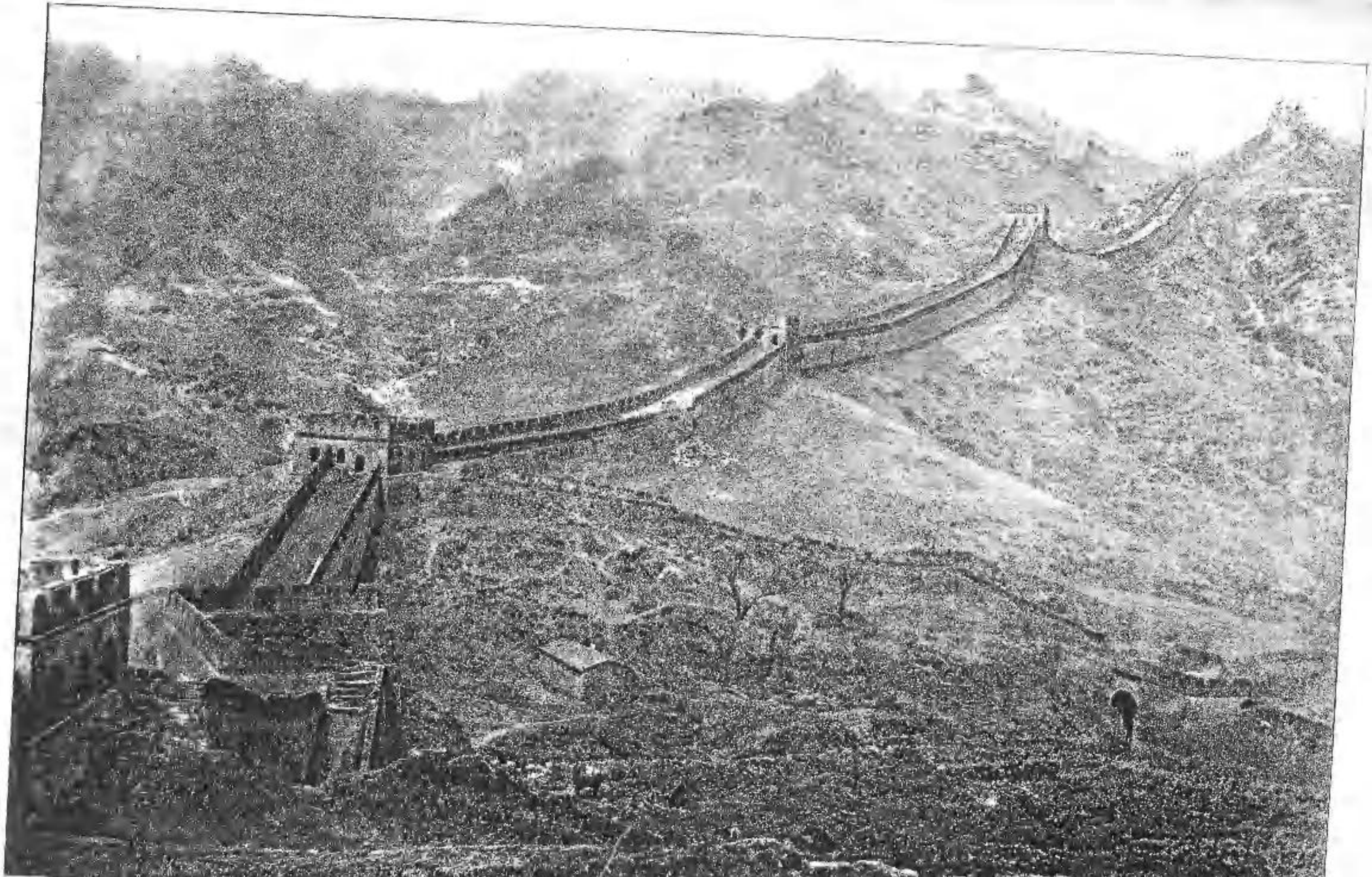


FROM A PHOTOGRAPH

THE GREAT WALL OF CHINA AS SEEN AT PA TA LING, NANK'OU PASS 45 MILES NORTH OF PEKING.

PHOTO-TINT by James Akerman London W.C.

THE GREAT WALL OF CHINA.[1]

By E. T. C. WERNER.

The interest attaching archæologically to a wall 1,500 miles in length and 2,000 years old is naturally of no small degree, and the desire to know more about it—who built it, and why?—arises no less naturally. Despite the fact, however, of Chinese history being twice as old as the Great Wall, the questions just asked do not admit of being correctly answered in so ready a manner as might at first sight be imagined. It has of late even been seriously maintained that the first question should be altered to, Was the Great Wall ever built at all? and if, as has been maintained no less seriously, it must when in this shape be answered in the negative, the second of course lapses entirely. It is the purpose of this paper to lay before the reader the facts as they are with the evidence adducible in support of them, and to draw thence inferences as to what ideas we may legitimately entertain with respect to the origin and past and present nature of a structure which, from our youth upwards, we have been taught to regard as one of the most marvellous objects on the face of the earth.

The traveller who, having accomplished the day's ride from Peking and the fatiguing journey up Nank'ou Pass, beholds before him the magnificent spectacle represented in the annexed illustration is, not unnaturally, on his return home, very positive in his assertions as to the existence and vast magnitude of the Great Wall. He has seen it with his own eyes, and he informs his friends that it fully realised, if it did not exceed, his highest expectations. Though his map does not furnish any ideas as to the dimensions or condition of the vast structure, it never-

[1]Read in the Architectural Section at the Annual Meeting of the Institute, at Leamington, August 9th, 1888.

theless contains a line representing a length of 1,500 miles similar throughout, and the mode of representation being the same from one end to the other it is but reasonable to suppose the wall to be so also. There is perhaps to be found among his heavier baggage a brick which he has brought with him to substantiate his arguments, and with this undeniable proof his non-travelling friends are finally convinced. Were we inclined to be hypercritical, we might here dwell upon the amusing anecdote which relates that a supply of bricks, similar to the genuine article in all respects except that of age, used to be kept in the British Legation at Peking for the convenience of those who had neglected to supply themselves with these pieces of irrefragible evidence whilst on the spot. Admitting, however, the possibility of the feat of procuring a genuine brick from the genuine Great Wall, and admitting, too, that the fallacies in our traveller's arguments are the fault, not of himself, but of those who, in the past, have made assertions without stopping to verify them, let us, as a preliminary to our enquiry as to how far such arguments are valid, examine the history of the Great Wall as closely as we are able by the light of the scanty records which have been handed down to us at the present day.

In the thirty-second year of his reign, says the *Kang Chien* in the portion treating of the Ch'in dynasty, the Emperor Ch'in Shih, proceeding (from his capital in Shansi) to the north, met one of his high officials named Lu, who had just returned from a sea voyage. In the course of conversation Lu called his Majesty's attention to a prophecy contained in the *t'u shu*, or book of diagrams for predicting future events, to the effect that the cause of the overthrow of the Ch'in dynasty would be the *Hu*. This, says the commentator writing by the light of subsequent events, really referred to Hu-Hai, who was the actual overthrower of the dynasty. A different interpretation was, however, put upon the word by the Emperor. He took *Hu* to mean the Huns, or Mongolians, and accordingly took the initiative and despatched Mêng T'ien at the head of 300,000 soldiers to the north to conquer the Huns, then designated "clamouring slaves," the Mongols of the present day. He captured forty-four *hosien*, or districts, extending from Honan to

the country of the Mongols, *i.e.*, the northern border of Chih-li, a stretch of country now (*i.e.*, at the time of the writing of the history) known by the name of the Hsin Ch'in Chung, and built a long wall, following the lie of the land, as a means of protection from the dangerous districts beyond the borders. This wall extended from Lin tao to Liao tung, and, including all its deviations, was over 10000, *li* in length; so that the Huns were overawed by the majesty of the Emperor.

Thus the historian of the Ch'in. He is followed by two or three commentators, who give their opinions as to the wisdom or otherwise of the Emperor's act, the injustice of using up the strength of his people in attempting to carry out an interminable task, and the advisability of his relying upon his subjects rather than upon a wall for the protection of his Empire. One suggests that, although the monarch did wrong in undertaking so great a work, yet if each sovereign, as he succeeded to the throne, were to employ a certain amount of labour in repairing in the same style as that adopted by Ch'in Shih, without omission from generation to generation, all subsequent ages would then respect it as a boundary line between the Chinese and the barbarians.

When it is stated that other descriptions and commentaries contained in Chinese works are perhaps as lucid and detailed, but certainly not more so than the one just translated, it will be readily understood that very little knowledge may be expected to be gained from such sources respecting the dimensions, time and method of building, or the history and uses of the Great Wall. The points on which they all agree, however, and which may be regarded as beyond doubt, are that the orginator of the work was Ch'in Shih, the founder of the Ch'in dynasty and first universal monarch of the Empire, and that the primary object of its construction was the effectual keeping out of the Huns, whom he had driven back into the wilds of Mongolia. The first of these statements, indeed, must not be taken without qualification, since some uncertainty appears to exist as to whether the builder erected a new wall altogether, or simply united and extended the short walls which the princes of some of the northern states had erected on their frontiers. Of these

two alternatives the one generally adhered to and the most probable is the latter.[1]

In the *mémoires concernant les Chinois* it is stated that the Prince of Tchao, named Ou-ling, began the Great Wall in the year 303 B.C., and conducted it from the borders of Petcheli as far as the Huang Ho, or Yellow River; then the Prince of Yen, from Liaotung as far as the Province of Chensi; then again the Prince of Tsin, from Ling-tao fu as far as the first entrance of the Yellow River into China. Ch'in Shah Huang had these three walls repaired, completed, and connected when he had subjected the whole of the Empire to his sway, but that portion which extends from the north of Ling-tao fu as far as Chia yü kuan, at the extreme west of Chensi (Kansuh of the present day), was not built until 200 years afterwards, in the reign of the celebrated Out-ti of the Western Hans. De Mailla, also, states that the Princes of Tchao and Yen caused walls to be constructed; the first from Tai (Sui-tê chou of Yen-an fu of Chensi) to the foot of the Inshan (the chain which borders the country of the Ordos Mongols on the north), as far as Kao-Kiné (a fortress 420 *li*, or 140 miles, north-west of Tao-tung fu), to place in safety the towns of Yun-chung (in the district of Tao-tung fu), Yen-mên (now Tai-chou of Tai-yüan fu of Chansi), and Tai-chün (a dependency of Tai-yuan fu); and the Prince of Yen had one constructed from Ch'ao-yang to Siang-ping (Liao-yang chou of Liao-tung), to protect Chang-kou (Pao-an Chou of Hsüan-hua in Chihli), Yu-yang (Ping-kou hsien in Chihli), Yu-pie ping (Yung-p'ing fu of the same province), and Liao-tung chun, which is a part of Liaotung. Though no mention is made by this author of the third wall which formed one of those connected by Ch'in-Shih, still the other statements agree as to the wall of Ychao, and both are at one in making that of Yen end at or near Liao-yang in Liaotung; but, as will presently be seen, the latter, if indeed it occupied the same site, is not the

[1] No ceremony seems to have been performed at, or legend to be connected with, the foundation of the Great Wall, as might be expected in the case of so vast an undertaking. Instances are given of walls being founded on human bodies in Japan, and the superstition that human blood was necessary to render the foundations of such works steadfast and the superstructure impregnable was very prevalent in primitive times. The absence of any such in connection with the foundation of the Great Wall of China seems to lend further support to the second of the two alternatives mentioned.

same as the wall which ends at the present day at Shan-hai Kuan.

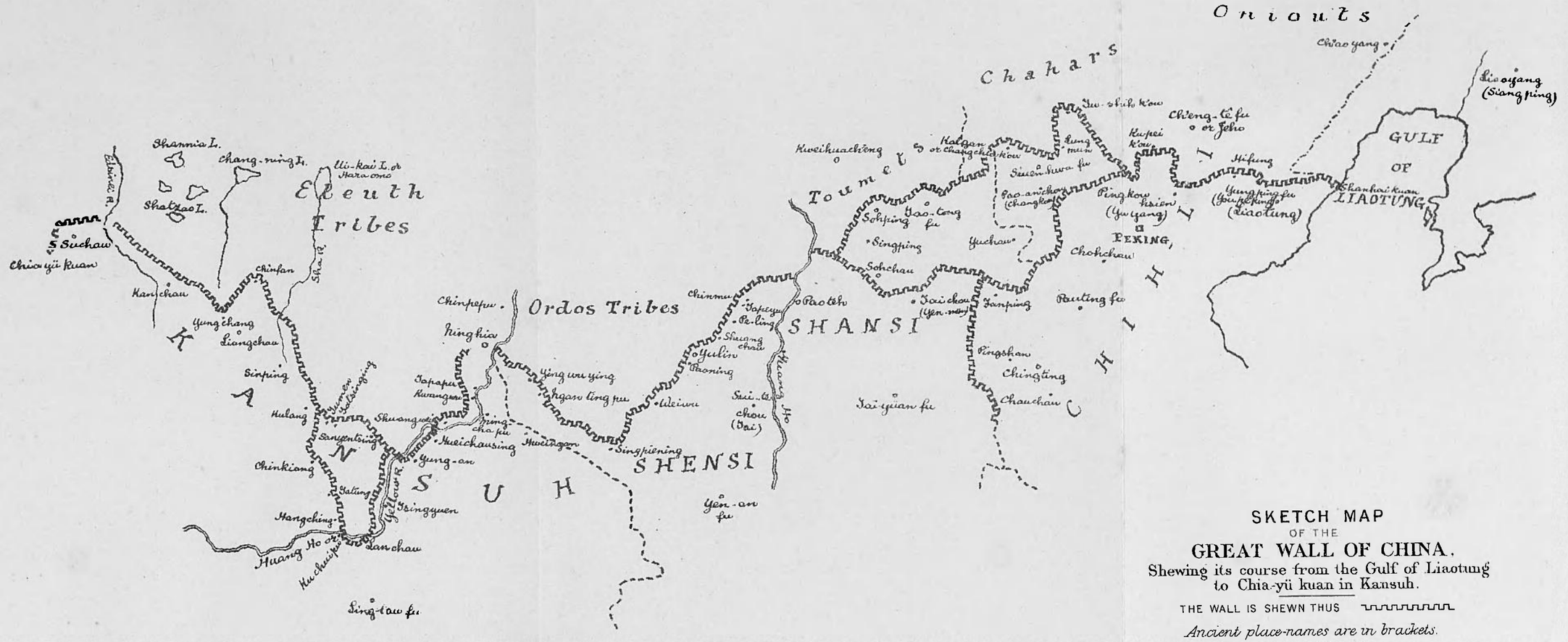
It will thus be observed that, though the work of repairing and connecting was doubtless great, and though it was through his agency that the Great Wall *as such* came into existence, the actual wall of the Emperor Ch'in Shih was comparatively short, and this should not be lost sight of in ascribing to him the title of its author.

In the accompanying sketch map an attempt has been made to represent the entire course of the wall, with the places above-mentioned as far as it has been possible to ascertain their positions or their modern equivalents. Although there can be no doubt, as will presently be explained, that the wall of Yen is not the fabric which we see at the present day, it is impossible, on account of the absence of details in the references to it which exist, to decide whether the two were erected on the same site, or whether the earlier occupied a more northern or more southern position than the present one. Kircher, indeed, in the quaint map which accompanies his work, represents the wall as running past the present town of Liao-Yang on the north and ending on the shores of the gulf due east from that place. His map, however, is full of inaccuracies, and it is obvious that in delineating its course he has fallen into the error of confounding the Liaotung of the present day with the more southern Liaotung of 2,000 years ago. Yet although it is tolerably certain that the kingdom of Yen did not extend so far north as would be the case if the Liaotung referred to as the terminus of the Great Wall were the present province of that name, still it is impossible to decide as to the exact course of the northern frontier upon which, his object being to protect his kingdom, the Prince of Yen would naturally have erected this defence. But whether or not the ancient and modern sites were identical it must not be supposed that Yen's *wall* is the identical one which now terminates at Shan-hai-kuan.[1]

[1] It should not be overlooked that if the Ch'ao Yang and Liao Yang referred to by De Mailla are the present places of those names, the position thus assigned to Yen's wall would agree with that represented by Kircher. But in all the native and foreign maps which I have been able to consult, the Prince of Yen's territory does not extend beyond the limit formed by the present Great Wall, and in many cases not nearly so far north, and any barrier joining these two places could not

The latter, extending from the sea-shore westward, past Ku-pei k'ou and Nan-k'ou, and then southwards between the provinces of Chihli and Shansi, is a new wall and was built in the Ming dynasty. Being at variance with those hitherto made, this statement requires some defence. Such, it seems to me, is to be found, firstly, in the fact of no mention being made of it by Marco Polo, to which I will refer later; and, secondly, in the impossibility of a wall built 100 years before the time of Ch'in Shih presenting at the present day so recent an appearance, comparatively speaking, as that which this portion does. Anyone standing on the sea-shore at Shan-hai kuan and looking at the wall where it abuts on the beach must, if he thinks, be forced to the conclusion that, washed as it is at high tide by the sea, this rampart, on the supposition of its being considerably over 2,000 years old, must long since have crumbled and decayed. The part usually stated to have been built by the Mings (and even this is said by Du Halde, who wrote 153 years ago, to be falling down in many places) is that which runs from its junction with the older barrier past Nank'ou in a south-western and southern direction, and divides the two provinces just mentioned, and the similarity in structure and condition of this portion with that which runs thence to the Gulf adds further weight to the above argument. A still further fact in its support would seem to be that, as stated by Kircher and other writers, the foundations of the original erection are said to have been laid *in* the sea, several ships filled with rough masses of iron being sunk to render it steadfast: "Supported on which foundations it rises towards the west and the region of Liaotung," etc. Whether this is fable, or whether it refers to the wall of Yen, which may or may not have termimitated at Shan-hai kuan, I am unable to say, but I can testify from personal observation that it *does not* refer to the one which exists at the present day at the latter place. This argument would also explain the reason of their being no trace left of the wall of Yen, as well as the

well have been erected by *him*. Its course westward, also, from the former place is not mentioned, and no record of a wall in this part, so far as I am aware, exists. I have, however, been unable to find any notice, ancient or modern, of a Ch'ao Yang other than the one entered in the map, and the course followed by the wall of Yen must therefore be regarded as extremely uncertain.



SKETCH MAP
OF THE
GREAT WALL OF CHINA.

Shewing its course from the Gulf of Liaotung to Chia-yü kuan in Kansuh.

THE WALL IS SHEWN THUS

Ancient place-names are in brackets.

100 80 60 40 20 0 50 100 150

Scale of English Miles.

very ruinous condition of those parts which are known to have been built about the time of the first Emperor of the Ch'in dynasty,[1] though, owing to the absence of any trace of foundations, some doubt may well exist as to whether certain portions were ever carried into execution at all. This refers of course only to the part designed by Ch'in Shih, and derives some support from historical facts. Of these the first is that only three of the ten years (B.C. 214 to B.C. 204) alleged to have been devoted to its construction had elapsed before the death of its founder; and it is more than probable that under the reign of his son, who, we are told, "was unable to maintain rule over the half-subdued feudal chieftains," the people, who "were required to supply a quota of men from each place, feed and clothe them while at work, and continue this expense until their portion was built," either desisted, on the fall of the "Napoleon of China," from the continuation of their task, or completed it in the rough and ready fashion of which the greater part of it is an example. "No Monarch," we read, "could have maintained an army which could force his subjects against their will to do such a work, or carry it on to completion after his death."

Be this as it may, there is abundant evidence that age *has* had on the portions which were built in those early times effects which we find to be wanting in the case of the part which we shall presently see to be the only one deserving the title usually applied to the whole.

"As soon," says Du Halde, "as one leaves it (the province of Chihli) to pass into that of Chansi towards Tientching Ouei, the wall begins to be nothing but beaten earth; it is without battlements or facing, smaller, and at most fifteen feet in height. However, when one has passed Cha hou keou, in lat. 40° 19′ . . . it is covered outside with brick, and among its towers there are some which are very large and built of brick on a stone base, but it does not continue always the same.

"The river Hoang Ho, bordered with watch towers, in which soldiers are stationed as sentinels day and night,

[1] A certain amount of doubt would appear to be thrown on the durability of these Chinese structures by the fact that the walls which Ch'in Shih is said to have repaired and connected were found by him in a *very dilapidated condition*.

"takes the place of the Great Wall towards the limits which separate the province of Chansi from that of Chensi.

"Beyond the Hoang Ho, as one goes towards the west in the province of Chensi, the wall is nothing but earth: it is low and narrow, and sometimes buried in the sand (for it is in a level and sandy district), and is in some places entirely decayed.

"The wall is only built of earth in these cantons (*i.e.* in the direction of Chia Yü Kuan), but it is kept in better repair than elsewhere on account of the proximity of the inhabitants of Hami.

"When one has passed a small town named Tchouang lan . . . . there is no longer any wall, but only a ditch of moderate size, except in the gorges near Si Ning, which are walled like those of the province of Chensi."

Père Gerbillon, too, who has been relied upon as one of the chief witnesses to its vast dimensions and incredible durability, says:—"It must nevertheless be acknowledged that those who have described it in their narratives have exaggerated greatly, imagining without doubt that it was throughout the same as they had seen it in some of the places nearest to Peking, or at certain of the most important passes."

"Now that the Manchus, "says De Mailla," are masters of China, the repair (of the wall) is naturally neglected; fortifications are only maintained at the weakest passes; the rest is falling to ruin."

Statements of like kind are also to be found in the writings of the Abbé Huc and in the *Missionary Travels in China and Chinese Tartary*. by the "Bishop of Corea." While taking exception to the too forcible language of the latter in the following extract we may quote his work as containing evidence on this point similar to that given above. "On the seventh of October," 1834, he says "we arrived at the Great Wall, so highly extolled by those who know nothing about it, and so emphatically described by those who have never seen it. . . . . The Great Wall has nothing remarkable, but its length, which is about 1,500 miles. . . . . This rampart, formerly covered with bricks, which have tumbled down, forms the frontier of three or four provinces, each of which would, in Europe, be a considerable kingdom. In the plains and

" ravines it is a regular wall fenced with battlements, between thirty and forty feet high; on the mountains, I doubt if its height exceeds ten feet; indeed, on the heights, it is little more than a ridge of earth, flanked by numerous projections like redoubts, but there is no person to guard them."

" We had occasion, says " M. Huc," to cross the Great Wall at more than fifteen different points; we often journeyed entire days following its direction, and without losing sight of it; sometimes we met only simple masonry, instead of the double walls that run along northward of Peking; sometimes it is an embankment of earth; it even happened to us to see this famous barrier exclusively composed of some small stones heaped together."

Of more recent evidence the following is extracted from a letter of a missionary in Kansuh published in the *Chinese Recorder* for May last. " It (the wall) is built throughout of loess and is not continuous, the longest piece without a break is perhaps a mile (English) long. It averages twenty feet high, and fifteen feet across at the top. . . . It will hardly last many years longer as its material is apparently much in demand for building purposes."

To these statements, to the truth of which I can testify so far as concerns those portions of the " real " Great Wall which I have visited, I will add only one more. " All accounts agree," says Mr. Simpson in his *Meeting the Sun*, " that that portion of the wall which we visited, and which is the nearest to Peking, is the best. Either the Emperors of the time were anxious to have it strong at that part, being nearest to the capital, or the contractors, or whoever had charge of the work, were closer to the eye of the authorities, and had to do their work well. To the westward of Peking the beautiful masonry ceases, the protecting towers become scarcer, and at last disappear. It even ceases to be a stone wall, and is in parts only an earthern parapet. Towards its western end Huc and Gabet crossed without dismounting."

Consider we now the relation all this bears to the absence of any mention of the Great Wall by Marco Polo. " It has often been cast in Marco's teeth," writes Colonel Yule, " that he makes no mention of the Great Wall of

China, and that is true; whilst the apologies made for the omission have always seemed to me unsatisfactory." *His* apology, however, seems to me as unsatisfactory as the others did to him. He says: "I think if we read 'between the lines,' we shall see reason to believe that the wall *was* in Polo's mind at this point of the dictation, whatever may have been his motive for withholding distincter notice of it. I cannot conceive why he should say: 'Here is what we call the country of Gog and Magog,' except as intimating.: 'Here we are *beside* the Great Wall known as Rampart of Gog and Magog, and being there he tries to find a reason why those names should have been applied to it." Polo, however, tried to find a reason why the name should have been applied to the *country*, not to the wall, and surely the deduction to be drawn from his words is just the opposite to that drawn by Colonel Yule. If the wall *was* in Polo's mind at the time of the dictation that would have been, judging from the habits of the veteran traveller, a very strong reason for his alluding to it; and that he does not do so seems to me to tend to prove rather that it was *not* in his mind. His want of success in finding a reason for the application of the name would not have caused him to withhold all notice of what would have been to him one of the most remarkable objects in the whole of his long journey. In the map at the end of the first volume of Colonel Yule's *Marco Polo* the route of the traveller is marked as crossing the wall about midway between Kuku Khotun and Sindachu, and as running thence first south-east and afterwards south-west, where it should again cross the southern branch of the Great Wall, which is omitted in the map. We know, however, from the text and from other maps in Colonel Yule's work that from Sindachu the traveller proceeded to Chandu, and returned thence to Cambulac, or Peking. Whatever may be the explanation of the discrepancies in the maps, we thus find that he should have crossed the wall no less than *four* times, not to mention his visits to Suchau and Kanchou in the west, where he must have crossed it first of all on his eastward journey. Surely so acute an observer could not have withheld notice of so vast a structure when, on the current hypothesis, it was thus frequently forced upon his

attention. It seems to me that the simplest and most probable explanation is, that Marco Polo did not see the Great Wall because it was not there to see. The old wall was decaying or dead and the new one was still unborn, and so he made no mention of either. We have seen that, at the present day, it would be easy to ride over the wall of Ch'in Shih without recognising in it anything conveying the idea contained in the words "Great Wall" as commonly interpreted. The walls of Ch'as and Yen decayed in less than a hundred years, and the Ming wall is already going to ruin, so that, more especially as no record exists of any repairs being done for at least 700 years before Polo's time (and even then it is extremely uncertain whether the portions repaired were in the part which would have been seen by that traveller), the most satisfactory way out of the difficulty seems to be the one above indicated; and the very mild references to a rampart of Yájuj and Májuj by Abulfeda and Rashiduddin can have no effect on this conclusion.

Having thus gained some idea as to what conceptions we may legitimately form of the existing condition of the Great Wall, let us examine its form and structure where we find it complete at the present day, taking as our example that part which merits in the fullest sense of the word the adjective usually applied to it.

The Wan li Ch'ang Ch'eng,[1] or myriad mile wall," the indefinite term applied to it by the Chinese, is seen at its best at Nank'ou Pass, and at many of the passes thence eastwards to the sea. The most complete account of it, as seen in the neighbourhood of Kupei k'ou, is contained in Staunton's *Account of Lord Macartney's Embassy*, and the plans, sections, and elevation annexed, with the references accompanying them, have been taken from that work. In explaining the structure, dimensions, and uses of the wall I shall avail myself largely of this description, partly because I cannot improve upon it, and partly because of the especial value attaching to it on account of the careful measurements taken by Captain Parish on the spot in 1793.

"What," says the author, "the eye could, from a single spot, embrace of these fortified walls, carried along

[1] lit., "ten thousand-li-long-wall," first so called in the Ch'in dynasty.

"the ridges of hills, over the tops of the highest mountains, descending into the deepest vallies, crossing upon arches over rivers, and doubled and trebled in many parts to take in important passes, and interspersed with towers or massy bastions at almost every hundred yards, as far as the sight could reach,—presented to the mind an undertaking of stupendous magnitude. . . . . The travellers were now able to determine, from their own feelings, that it was not alone the dimensions of those walls, however considerable, that made the impression of wonder upon the persons who had hitherto seen these intended barriers against the Tartars. Astonishment seldom is excited by the mere effect of the continuance or multiplication of labour, that may be performed by common means. It was the extreme difficulty of conceiving how the materials could be conveyed, and such structures raised, in situations apparently inaccessible, which principally occasioned surprise and admiration. One of the most elevated ridges over which the great wall is carried has been ascertained to measure five thousand two hundred and twenty-five feet.

"This species of fortification, for to call it simply by the name of wall does not convey an adequate idea of such a fabric, is described to extend, though not equally perfected throughout, in a course of fifteen hundred miles; for of that length was the boundary line between the civilized Chinese, and several restless Tartar tribes. Upon such barriers, indeed, was not supposed to depend the fate of nations in actual war. A superior army is always found to overcome every species of defence; no fortification is impregnable; but fortresses delay the progress of an enemy. They preserve a country from being surprised by a sudden invasion; and fortified walls protracted along a boundary line, serve as a protection against sudden unexpected inroads, or the partial attacks of individual plunderers in the midst of peace."

Particular attention was paid by Captain Parish, who accompanied the Embassy, to the architecture and dimensions of the walls and towers. I cannot do better than quote *in extenso* his accurate description and careful measurements. He observes,—

"The body of the great wall is an elevation of earth,

"retained on each side by a wall of masonry, and terraced by a platform of square bricks. The retaining walls, continued above its platform, form its parapets. Its dimensions, independently of fractional parts, were as follows:

	Feet.
"Height of the brick work to the bottom of the cordon	20
"From the bottom of the cordon to the top of parapet	5
"Total height of the brick wall ...	25

"The brick wall is placed upon a basis of stone projecting about two feet beyond the brick-work, and of which the height is irregular, owing to the irregularity of the ground over which it runs; but not more than two courses appear above the sod, amounting to somewhat above two feet.

	Feet.	Inches.
"Thickness of each parapet wall at top	1	6
"At the cordon	2	3
"Depth of the cordon ...		6
"Projection of the cordon ...		6
"Thickness of each retaining wall where it rests upon the stone base	5	0

"The bottom of the cordon is upon a level with the terrepleine of the wall.

"Entire thickness of the wall, including the elevation of earth, which is eleven feet thick in every part of it.

	Feet.	Inches.
"At the cordon	15	6
"At the bottom of the brickwork	21	0
"Thickness of the stone base ...	25	0

"There is, in many parts, a small ditch beyond the stone foundation of the wall.

	Feet.	Inches.
"In relation to the embrasures, the height of the merlon is ...	2	0
"Width of the embrasures within and without	2	0

" Distance between them, from centre to centre... ...	9	0
" As to the loopholes		
" Height of the opening ...	1	0
" Width of the opening ...		10
" Depth of the scarp ...	4	0
" Distance between two ...	9	0

" The bottom of the loopholes is on a level with the terrepleine of the wall, and from thence they are sloped downwards, so as to discover an enemy within a few yards of the basis of the wall. It will perhaps be thought that this position is much better calculated for the use of firearms, than for that of bows and arrows.

" The towers incorporated with the great wall are distant from each other about 100 yards; but as the plan of the wall is a curve line, this distance estimated by that line is variously, and sometimes considerably increased; when greater strength was required, they are sometimes more frequent. Their dimensions and constructions, and the positions they hold with respect to the wall, also vary considerably with their situations. The first of those which was examined consisted of one story upon a level with the terrepleine of the wall; and above this, a parapet nearly similar to that of the wall. It had three embrasures or ports below in each front, and two in each front of the parapet of its platform. Its dimensions were as follows :- -

	Feet.	Inches.
" Length of each side of the square at the base	40	0
" Length of each side at the top...	30	0
" Height of its stone base ...	4	0
" Height of the brick wall from the stone base to the cordon ...	28	4
" From the cordon to the top of the parapet	5	0
" Total height of the tower ...	37	4
" Width of the lower embrasures or ports	3	0
" Their height	3	0

" The embrasures of the parapet were of the same dimensions as those of the wall.

"This tower projects eighteen feet beyond the wall, towards Tartary. At the base it is entered off the platform of the wall by one of its ports, which is cut away a little for this purpose.

"The second tower which was examined differed materially from the first, as to its form, dimensions, and situations. It consisted of two stories, besides its platform. The lower story was on a level with the terrepleine of the wall. It was a square and almost solid mass of stone, intersected with arched passages in the form of a cross, at each extremity of which was a window or large port in the centre of each side of the square. By two of these it communicated with the terrepleine of the wall on each side; thus this tower offers two flanks to the wall. Midway between the entrance and the centre of the cross is a narrow staircase, at right angles to the direction of the wall, which communicates with the second story, This may be said to contain but one room, formed by three parallel arches, in a direction perpendicular to the entrance, having three arched intervals of communication between each. Those in the centre are in a line which bisects the building, and are in the direction of the wall; the others are in lines parallel to this on each side. Thus a square room is formed, consisting of three equal arches, parallel to each other, and three lines of arches of communication, leaving four square piers of masonry about the centre. The extremities of each parallel arch are pierced for ports or embrasures, three of which face the wall on each side; the entire ports facing the wall enfilade the terrepleine on each side of the tower; the others flank the sides of the wall in each direction. The ports in the other faces of the tower look to the north and south. In the parapet of the platform are twelve embrasures, three in each front, with a loophole in each interval. Thus each front in this tower presents on the lower story one port, on the second story three ports; on the platform three embrasures and five loopholes. It owes probably the superior strength of its construction to its vicinity to the river, and short distance from the outer gate. On this latter account it is that the tower is particularly strengthened on each side of the wall, defending it on

"one side towards the river; and should this be forced, protecting on the other side the entrance of the gate. The dimensions of this second tower were as follow:

	Feet.	Inches.
"Height of the stone base ...	4	0
"Floor of the first story ...	16	0
"Height of the arch of the first story	8	0
"Thickness of the arch ...	1	3
"Thickness of the flooring of the second story		4
"Height of the parallel arches ...	12	0
"Thickness of the parallel arches	1	3
"Thickness of the flooring of the platform		4
"Height of the parapet of the platform	5	0
"Total height of the tower	48	2
"Length of each side of the square at top	36	0
"Length of each side of the square at the base	42	0
"Dimensions of the lower story.		
"Width of the intersecting arches	3	0
"Length of the intersecting arches	33	0
"Height of the arches ...	8	0
"Width of ports or embrasures ...	2	0
"Height of the same ...	4	0
"Height of the cut for doors ...	5	0
"The embrasures are arched at the top.		
"Width of the opening for staircase	2	0
"Height of the opening ...	4	0
"Dimensions of the second story.		
"Length of each side of the room	28	0
"Width of the parallel arches ...	6	0
"Length of the same ...	28	0
"Height of the same ...	12	0
"Interval between the parallel arches	5	0
"Width of arches of communication	5	7

" Length of the same	...	5	0
" Height of the same	...	8	0
" Length of the piers of masonry	...	5	7
" Breadth of the piers	...	5	0
" Width of recess for embrasures		4	0
" Depth of recess ...	...	2	6
" Height of recess	...	8	0
" Width of the embrasures	...	2	0
" Height of the embrasures	...	4	0

"The dimensions of the parapets, embrasures, and loop-holes, are as in the first tower.

"The embrasures or ports in each of the rooms, and the recesses for those of the second story, are all arched.

"The coins of the doors, windows, ports, embrasures, and many of the salient angles and staircases in the towers, as well as the broad bases or stone foundations of the towers and intervening wall, are of a strong grey granite, with little mixture of mica in it.

"The rest of those buildings consist of bricks of a bluish colour. They are laid in laminæ of a brick thick each; forming, as it were, so many distinct walls as there are bricks in thickness. They differ in their dimensions according to the situations in which they are placed. Those in the front of the wall and towers, are as follows:

		Feet.	Inches.
Thickness of the bricks	...		$3\frac{3}{4}$
Width of the same	...		$7\frac{1}{2}$
Length ...	...	1	3

"Those for the terraces of the wall and towers, differ only from the former in being perfectly square, each side containing fifteen inches. Wherever, for finishing the tapering tops of the parapets, bricks of the usual dimensions would not answer, instead of rudely chipping off these to the form required, as has been sometimes directed by negligent or ignorant artists, care was taken to mould other bricks purposely of the form and size proportioned to each separate use. The cement or mortar between the different layers of brick, was upwards of half an inch in thickness, and had a very small proportion of any ingredient in it, to alter the perfect whiteness of the calcined limestone.

"The blue colour of the bricks, led to doubt whether they had been exposed to any greater than the sun's common heat, though they had so long resisted the influence of time and weather. It has been ascertained by experiment, that a mass of clay or brick contracts in its dimensions when exposed to the action of fire; and that this contraction is increased in proportion as the heat augments; but that the mass does not return to its former dimensions after being withdrawn from the fire. Had the bricks, used for the great wall, been baked only in the sun, they would contract when exposed to a wood fire or red heat; but which, on trial, turned out not to be the case. Indeed some of the kilns still subsist near the great wall, where probably the bricks of which it is composed were burned.[1]

"The great wall does not appear to have been intended as a defence against cannon, since the parapets are insufficient to resist the force of cannon shot. But the soles of embrasures of the towers, were observed to have been pierced with small holes, similar to those used in Europe for the reception of the swivels of wall-pieces. The holes appear to be a part of the original construction of the wall; and it seems difficult to assign them any other purpose, than that of resistance to the recoil of fire-arms. The field-pieces seen in China are generally mounted with swivels, for which these holes are well calculated; and though the parapets are not capable of resisting cannon shot, they are sufficiently strong to withstand these small pieces. Several of them were observed on the parade of the troops at Koo-pe-koo. They were mounted upon stands, on which they traversed with swivels. From these considerations, it does not seem unlikely, that the claim of the Chinese to a very early knowledge of the effects of gunpowder, is not without foundation."

To this detailed description I will only add one remark with reference to the last paragraph. The wall certainly, as Captain Parish remarks, does not appear to have been intended as a defence against cannon. Both Kircher and

[1] This is another fact tending to prove the comparatively recent construction of this part of the wall, for there is nothing in a Chinese kiln, even if it escaped being filled with sand and thus rendered undiscernible, to cause it to endure so as to be recognisable 2,000 years after it had ceased to be used.

Du Halde relate that the work was built of such strength that if a nail could be inserted anywhere in the joints of the stones, the builders of that part atoned for the defect with their lives; and though this may have been but a test of general good workmanship, still the idea which presented itself to the mind of the artificer seems to have been one of spears and arrows rather than of shot and shell. The towers also, in the older structure, are said to have been built two *bow-shots* apart, so that the whole space between might, if necessary, be protected by them. The fact of the finding of holes which, if Captain Parish's supposition is correct, were intended for the reception of the swivels of wall-pieces, seems to confirm what I have said above as to the age of the part of the wall just described; for, whatever knowledge the Chinese may have had of the effects of gunpowder in primitive times (and the researches of Mayers show that this explosive did not probably become known to them—and then to a partial extent only, and from foreign sources—until about the period 500-600 A.D.), they certainly had not begun, so early as the Ch'in dynasty, to fight with powder and shot.

Our conceptions, then, of the Great Wall of China must be modified on the following points. In place of one continuous wall of vast dimensions extending uninterruptedly for a distance of one thousand five hundred miles, winding over hill and dale, mountains and rivers, and presenting an appearance almost as new and uninjured as when built by the Emperor Ch'in Shih two thousand years ago, we must picture to ourselves several walls, all now in a more or less ruined condition, some built before and some after the reign of the Emperor just named, which may or may not have been repaired, completed, and connected by him, and at one time have presented the magnificent spectacle which we are usually taught to look upon as exhibited throughout in the same proportions and elaborate degree of finish in the older Great Wall as we find in that portion which was constructed during the Ming dynasty. As regards the latter we have seen that it must be considered to be of greater extent than is usually supposed, extending not merely in a north and south direction

between the provinces of Chansi and Chihli, but also eastwards to the sea at Shan-hai Kuan, being either an entirely new wall or the repair of an older one now decayed; but in any case not being the original wall either of the Prince of Yen or of the Emperor Ch'in Shih; a conclusion which we found to accord with the present comparatively recent aspect of that part, to account for certain appearances in the existing structure which have had no use in primitive warfare, and to explain also, in a more satisfactory manner than has hitherto been done, the silence of Marco Polo on the subject.

The Great Wall of China will never be repaired. It will stand on in silence through the ages like some vast tombstone of a bygone time, but the circumstances which caused its erection and would necessitate its restoration will never recur. Now that China is learning that floating walls are of more real service to her than stone ones, she is not likely to waste on the latter energies which she perceives would be more usefully expended in making and organising the former; and although her principal enemy occupies relatively the same geographical position as did the nations against whom the wall was erected as a defence, yet, however serviceable they may have been in the past, such appurtenances of primitive warfare would be of little use in the present. So that this vast structure, which has been reckoned amongst the seven wonders of the world, and has, as it were, been a spectator of interesting periods of Chinese history for so many ages of a picturesque past, has nothing left but to await the day when Time shall bid it cease to exist.

THE GREAT WALL OF CHINA.

Fig. 1

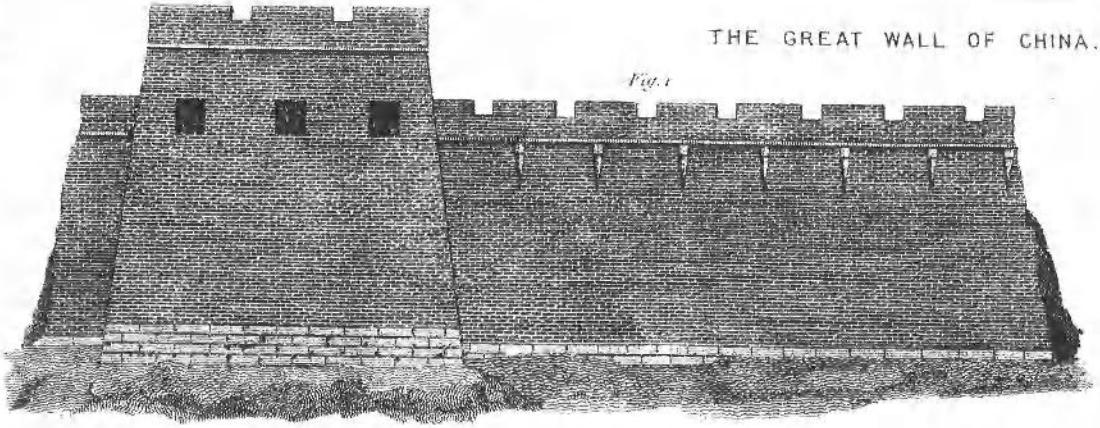


Fig. 2

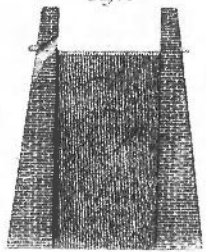
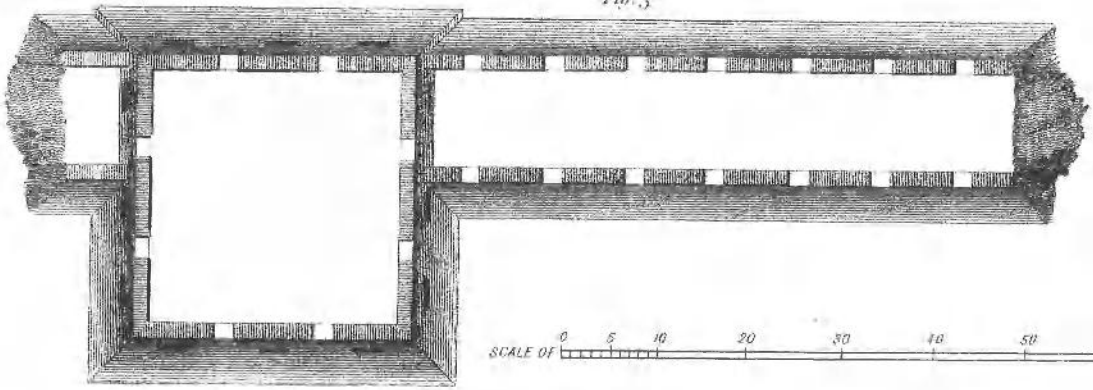


Fig. 3



THE GREAT WALL OF CHINA.

Fig. 4

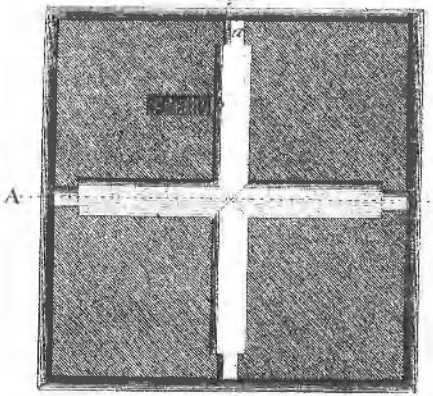
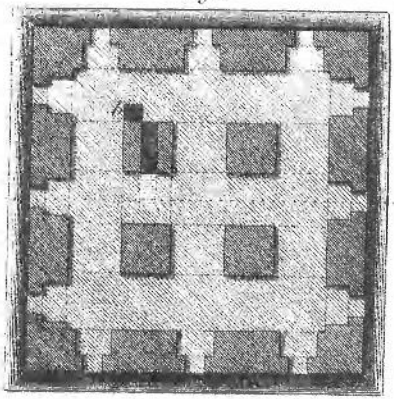


Fig. 5



SCALE OF 0 5 10 20 30 40 50 60 70 80 FEET

Fig. 6

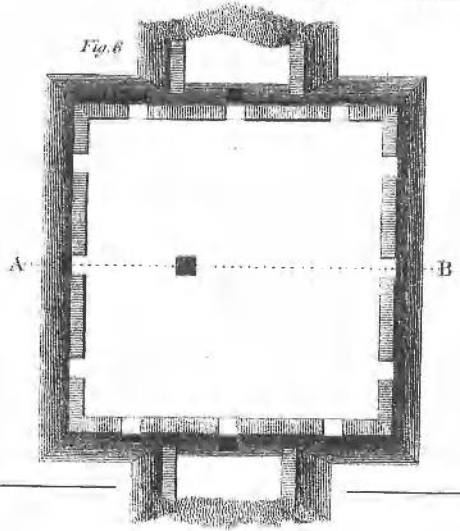
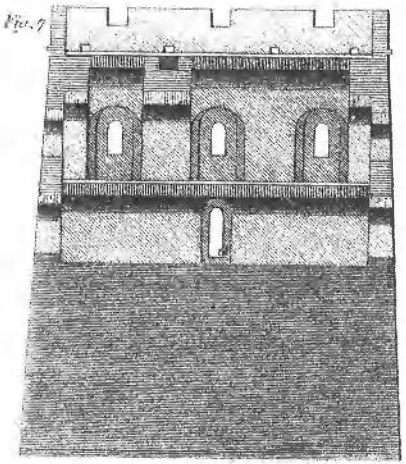


Fig. 7



PLANS, SECTIONS, AND ELEVATION OF THE GREAT WALL OF CHINA, and some of the Towers, near the Pass of the pei k'ou. From Staunton's Account of Lord Macartney's Embassy, 1793.

References.

Plate I.

Fig 1.—Elevation of the Great Wall with a Tower.
2.—Section of the Wall.
3.—Plan of the Wall and Tower.

Plate II.

4.—Plan of the lower story of a Tower.
5.—Plan of the second story.
6.—Plan of the platform of the top of the Tower.
7.—Section through AB.

Remarks.

The section shows two retaining walls whose thickness is one foot six inches at the top, and five feet at the base. They are built of bricks of a blueish colour. The width of the top, including the thickness of the parapets, is fourteen feet; the intermediate space is filled with earth and small stones, with a terrace of bricks, each one foot three inches square, and three and three-quarter inches in thickness.

The tower is entered from the wall by a postern [*a*] (Fig. 4 & 7), which for this purpose is cut a little lower than the other parts of the same story, as appears by the section (Fig. 7). The terrepleine of the wall is on a level with this story. The room consists of two arches intersecting one another at right angles, at each extremity of which there is a port.

The communication with the second story is by the stairs marked [*b*] (Figs. 4 & 5). The room (Fig. 5) consists of two parallel arches in the direction of AB, having three arched intervals of communication between each perpendicular to that direction. They are marked by dotted lines in the plan. An arch is also thrown across the centre principal arch which is described in the plan by dotted lines. This is necessary for the completion of the stairs of communication with the platform of the tower. (See Fig. 6).

On the platform are twelve embrasures, and a loop-hole in each interval is opened from the bottom of the parapet. The centres of the soles of the embrasures are pierced with small holes similar to those in Europe intended for the swivels of wall-pieces.

By the section it appears that the arches between each story are one foot three inches thick, the most general length of a brick, to which four inches are added for the thickness of the terrace of brick, which is general through all the work.

The towers differ in their construction; one (of which Staunton gives an elevation), was observed to have greater strength and height than most of those near it on account of its situation upon the river.