SCIENCE.—SUPPLEMENT.

FRIDAY, JANUARY 8, 1886.

THE PALACE OF THE KINGS OF TIRYNS.

"THE untiring enthusiasm and liberality of one man have earned the gratitude of all civilized races, so long as the human past shall have any interest for mankind." These were the words with which one of the most accomplished of English scholars welcomed the appearance of Dr. Schliemann's narrative of his explorations at ancient Mykenae. And now we have to thank him for another volume,[1] equalling in interest the four he has already given to the world of letters, and even surpassing them in the beauty of its mechanical execution. Moreover, we think he has displayed sound judgment in allowing his learned collaborators to contribute the major part of the text of the present volume, for it is by his energy and success as an explorer that he will be always remembered. He is neither a learned scholar nor a trained archeologist; and, where he has relied solely upon his own resources in setting forth the results of his researches, he has frequently drawn conclusions which have met with but little favor at the hands of scholars. From similar failings the present work is by no means exempt: but such blemishes, like patches on the cheek of beauty, only heighten the intrinsic merits of this most important contribution to our knowledge of the ancient world; not to our knowledge of what is commonly understood by the phrase 'prehistoric times,' — for we think it a misnomer to call what he has brought to light 'the *prehistoric* palace of the kings of Tiryns,' who, as he thinks, flourished some fourteen hundred years B.C., — but to our accurate comprehension of the heroic age of Greece, those early times about which, hitherto, the Homeric poems have been our only source of information. We may well be grateful to him for the light which has thus been shed upon many an obscure passage or questionable statement in those earliest records of the western world. But in regard to what is known in archeology as the 'prehistoric period,' by which is to be understood a certain stage in the development of civilization, Dr. Schliemann seems to entertain very misty notions. He speaks of finding in the ruins of the palace arrow-heads of obsidian "rudely made; in fact, as rudely as the arrow-heads of silex found in the cave-dwellings of the age of the mammoth and the reindeer in the Dordogne, in France, and to be seen in numbers in the prehistoric museum at St.-Germain-en-Laye" (p. 78). But no such things exist as rude arrow-heads found in the caves of the Dordogne; and it is one of the commonplaces of prehistoric archeology that in the paleolithic period, to which these caves must be referred, bows and arrows had not yet been invented. He gives four drawings of these remarkable 'arrow-heads,' which precisely resemble four similar objects that the writer picked up upon the slopes of the Acropolis at Athens. But they are only fragments of obsidian flakes, which are abundant upon prehistoric sites in Greece; and they merely prove that a particular spot was occupied by man in the stone age. Yet the finding of these bits of stone, accompanied by fragments of rude, hand-made pottery, in the *débris* of the palace, furnishes our author his main argument to prove that it was destroyed in prehistoric times. But it is a common thing to find such fragments as these disseminated throughout the soil in the places where they occur; and, although Dr. Schliemann may have come upon them in the earth that has accumulated above the ruins of the palace, their presence proves nothing more than the antiquity of the site, whether it be at Tiryns or at Athens. But Dr. Schliemann can actually believe that such rude arrow-heads as these were still in use contemporaneously with the occupation of the remarkable edifice he has disinterred and described. His own excavations, however, at Mykenae had already disclosed the kind of stone arrow-heads employed at the close of the high civilization of the bronze age, — exquisitely fashioned out of obsidian, of the Solutré type, thin, delicate, and provided with barbs.

So, again, he argues for a very high antiquity for the earliest remains he has discovered, because he finds among them a kind of rude, hand-made pottery, consisting of vessels, or portions of them, provided with handles pierced with two perpendicular holes for suspension; while, of those having similar horizontal perforations, two examples only were met with. The former kind is not uncommon in the Swiss lake-dwellings, and in some other localities belonging to the Neolithic period; and he quotes Professor Virchow as authority for inferring from such similarity 'a direct connec-

[1] *Tiryns: the prehistoric palace of the kings of Tiryns.* The results of the latest excavations. By Dr. HENRY SCHLIEMANN. With preface by Prof. F. Adler, and contributions by Dr. William Dörpfeld. New York, *Scribner*, 1885. 4°.

tion' between the two places (p. 64). Virchow, however, had many other points of resemblance which are wanting at Tiryns, besides this single one, to bring forward, between the rude, early pottery of the two sites he was comparing.

The stages of civilization of the lake-dwellers of Switzerland and of the Homeric heroes differ as widely as does the dawn from high noon; and the endeavor to relegate the occupants of a palace whose artistic decorations excite only wonder and admiration to the status of the age of polished stone, or even of the early bronze age, displays a singular misapprehension of the teachings of prehistoric archeology.

That the huge, so-called Cyclopean walls of Tiryns should have inspired the belief in their hoar antiquity, and that around them should have clustered myth and legend, is not to be wondered at. The strange circumstance is, that it is in the later writers principally that this crop should have sprung up. It is worthy of remark that Tiryns is mentioned but once in the Homeric poems, and that only in the 'Catalogue of forces,' which by most scholars is regarded as a late interpolation. There it is characterized by an adjective which means 'the well-walled' (Iliad, ii. 559), and our author thinks that "Homer expresses his admiration for the walls by this epithet, which he bestows on Thebes" (p. 17). The fact is, however, that this word occurs in only one other passage in the poems, some hundred lines after its first use; and there it is applied, not to Thebes, but to the ancient city of Gortys, in Crete. This is the place where last year was discovered the longest and most important inscription yet known in the archaic Doric dialect, probably of the sixth century B.C. But at Gortys there are no Cyclopean walls, and we feel constrained to believe that the epithet was employed by the poet in both instances solely for its metrical advantages.

Leaving, then, the Homeric poems out of the case, there is no question that these huge walls have stirred the wonder and admiration of all modern travellers, and many have been the attempts to account for them, and to discover who were their builders. We can hardly, however, look upon Dr. Schliemann's as the most happy solution of the problem. He thinks that "we may assume with great probability that they were built by Phoenician colonists, and the same is probably the case with the great prehistoric walls in many other parts of Greece" (p. 28). How is it, then, we may ask, that a precisely similar style of construction is to be seen in mountain fastnesses in the Apennines of central Italy, where no foot of Phoenician trader ever penetrated, while no such example is to be found in Phoenicia proper, or in her greater daughter, Carthage? Much more probable seems to be Mr. Gladstone's conjecture that they are "the handiwork of the great constructive race or races made up of several elements, who migrated into Greece, and elsewhere on the Mediterranean, from the south and east." But we doubt if the key to the mystery is to be sought in peculiarities of construction; since archeologists now are of one accord that the huge polygonal style of building, in all of its different varieties, to the rudest of which alone the epithet 'Cyclopean' should be restricted, arose from the natural cleavage of the material used for building-purposes.

Equally unsatisfactory seems to be Dr. Schliemann's attempt to overthrow the established date of the destruction of Tiryns by the Argives, 468 B.C., in favor of a period so much anterior to this as the return of the Herakleids, which he places at about 1100 B.C. In this, it is true, he is sustained by the authority of that most hardy of the investigators of ancient history, Professor Sayce, while Professor Mahaffy also rejects the received chronology. But it is certainly suggestive that the very passage in the Iliad (iv. 52) which is cited by Professor Sayce in confirmation of such a theory, should have been previously brought forward by another eminent iconoclast, Professor Paley, as equally conclusive to establish the comparatively late date of the existing version of the Homeric poems.[1] But the universal consensus of historians, backed by the irrefragable testimony of the bronze serpent, which once supported the golden tripod dedicated by the Greeks at Delphi in commemoration of the battle of Plataea, and which is now to be seen in Constantinople, would seem to outweigh our author's archeological evidence in support of his new view, which would appear to consist of a *graffito* in eleven archaic letters scratched upon a bit of 'lustrous black Hellenic pottery,' re-enforced by numerous rude female images, which possibly may be only archaistic, and which, at any rate, bear a striking resemblance to the children's playthings found in the tombs at Athens.

But enough, perhaps too much, has been said about our author's theories: let us turn to some of the actual gains to knowledge acquired by his liberal use of the spade at Tiryns; only we must first enter our protest against his failure to do justice to his townsman, Dr. Rhaugabé. Referring to the appearance of the site before he commenced operations there, he says, "Many of the walls were visible on the surface, and had misled the best archeologists, as they were assumed to be

[1] Transactions of the Cambridge philosophical society, xi. p. 383.

mediaeval, and it had never been imagined that they could be perhaps two thousand years older, and belong to the palace of the mythical king of Tiryns" (p. 8). Who would suppose, upon reading this, that twenty years ago Dr. Rhaugabé, in his 'History of ancient art' (p. 63), had stated that "it is highly probable that these are the remains of the primitive palace of Proetus"? We have here an instance of the same self-complacency which manifests itself also in a remark about his "excavations in the prehistoric tumulus on the plain of Marathon, which previously had been wrongly regarded as the tomb of the one hundred and ninety-two Athenians who fell in the battle" (p. 78). Dr. Schliemann seems to have never read Byron's well-known verses upon Marathon and 'the violated tomb,' and not to know that years ago the tumulus was explored by a Frenchman; which may, perhaps, explain why our author found so little in it, even if its situation itself, in a sandy plain hard by the water's side, would not be sufficient to account for the disappearance of the bones of the heroes who were buried under it, as we may fairly infer from what Thucydides and Pausanias and Kritias tell us.

The first decisive result of the explorations at Tiryns has been to establish the fact of the existence there of two successive structures, built upon a limestone rock which rises to a slight elevation above the surrounding plain. The primitive fortress was constructed of sun-dried bricks and wood, according to Professor Adler, and traces of the sub-structures of a huge gate-tower belonging to it were discovered under the foundations of the palace (p. xii.). Remains of its walls built of rubble and dry mortar of clay were found by Dr. Dörpfeld, buried deep in *débris*, through which a trench had to be dug before the foundations of the terrace-wall of the upper citadel could be laid (p. 252). Besides these proofs drawn from the construction, there were found among its ruins numerous fragments of rude pottery, mostly hand-made, though in some instances showing a knowledge of the potter's wheel, which presents so great a contrast in form, *technique*, and decoration, to the pottery occurring in the ruins of the subsequently erected Cyclopean palace, as to prove, in Dr. Schliemann's judgment, that they are the work of totally different peoples. This opinion is based upon arguments derived from the continuity of style always to be observed in the art-products of the same race, even at very different periods, which he ascribes to Mr. Dennis, but which really ought to be credited to Professor Brizio (p. 57).

But the crowning achievement of Dr. Schliemann's labors has been the discovery that those vast walls, piled up, of huge unhewn stones, so massive that in the exaggerated language of Pausanias "a yoke of mules could not move the smallest of them from its place," were raised for the defence of 'a lordly house,' of which the uniformity of design in its ground plan, and the skilful distribution and arrangement of all its parts, have given to the trained eye of an architect a most favorable impression of the builder's talent and experience. It is indeed a revelation to the world that the high stage of civilization which the Homeric poems disclose was not merely a poet's dream. In the glowing language of Dr. Dörpfeld, "we see the mighty walls, with their towers and gates, and enter into the palace by the pillar-decked Propylaed. We recognize the men's court, with its great altar, surrounded by porticos; we see, further, the stately Megaron, with its ante-room and vestibule; we even enter the bath-room, and finally pass on to the women's dwelling, with its separate court and numerous chambers. This is a picture which floats before the mind of every reader of Homer, — a picture which many a *savant* has endeavored to restore after the data given by him. All such attempts, hitherto, have been to some extent unsatisfactory. There always remained questions to which all the acuteness in the world, on the part of Homeric scholars, could give no answer in the words of the poet. Many of these riddles are now solved by the palace at Tiryns" (p. 192). But to attempt even the briefest *résumé* of the interesting and instructive chapter in which Dr. Dörpfeld has given a detailed account of the plan of the citadel, and the singular method of construction of its walls, with their covered galleries and concealed chambers, of the arrangement of the approaches to it and the hitherto unknown stairway conducting to the postern gate, and finally of the palace itself in all its several parts, and the building-materials employed in it, as these all were brought to light in the explorations of the summers of 1884 and 1885, — this would far exceed the space at our command. We can only refer to some remarkable discoveries, which throw light upon the character of the civilization to which the building belongs, and which are most striking from their novelty.

We think the series of nine plates, in which are depicted fragments of plastered walls, painted with frescos in five different colors, cannot fail to stir the admiration of every lover of the beautiful, whether he be a student of antiquity, or not. Who could have imagined that the palace walls, in the Homeric age, were ornamented with decorations which for beauty and grace of design, and freedom and boldness of execution, surpass the fresco-painting of our own day? What life and power

the figure-piece of the bull-tamer, leaping upon the back of the beast in full career, displays! The beautiful frieze made of slabs of alabaster, decorated with sculptured ornaments and inlaid with pieces of dark blue smalt, is most interesting, not only for its intrinsic elegance, but for the confirmation it has given to a conjecture of Helbig in explanation of one of the Homeric puzzles, the nature of the frieze of *kyanos*, which adorned the palace of Alkinòos (Odyssey, vii. 86). This is the substance which Mr. Gladstone supposed to have been bronze, and which Mr. Evans, following the general opinion, has reluctantly conceded to have been dark blue steel, but which we now have every reason to believe to have been a blue glass paste. Another surprising discovery was the bath-room, containing a fragment of a bathing-tub, made of thick terra-cotta, and resembling in form similar articles in use to-day. After such a substantiation as this, of the numerous instances in the Homeric poems where mention is made of the 'well-polished bathing-tubs,' we may perhaps feel warranted in believing that in the heroic age sometimes these were actually made of silver, like the two which 'Polybus, who dwelt in Thebes in Egypt,' gave to Menelaus (Odyssey, iv. 128).

Reluctantly we lay aside this interesting volume, fully sharing in the regret expressed by Dr. Dörpfeld at the fate that must speedily overtake much of what has thus been brought to light after its sleep of centuries in the lap of mother-earth. He says that it is doomed to certain destruction, although the Greek government intends to do all in its power to protect the palace with a roof and in other ways (p. 250). But even if the material parts must perish, its teachings have been embalmed forever for posterity in this noble volume, which, as we said at the outset, we owe to the liberality and enthusiasm of Dr. Schliemann.

WINTER ON MOUNT WASHINGTON.

THERE are three distinct types of winter weather on Mount Washington that offer good illustration of the control of wind over temperature. The most common, and certainly the one most frequently associated with the popular estimation of the mountain's weather, appears with the westerly or north-westerly winds of considerable strength that blow between a centre of low barometric pressure lingering over the provinces or in the Gulf of St. Lawrence, and a centre of high pressure on the lakes or in the Ohio valley. The sky is clear or fair, the wind blows fifty to eighty or more miles an hour, and the temperature falls to a point worthy of newspaper items. This is the time of hardship for the observers in the signal-service station: clearing the anemometer cups of the frost-work that forms on them is then no pleasant task; but, if not cleared, the frost-work fills the cups, and prevents their proper turning, or they become so heavy that the centrifugal force of their rapid whirling may tear them from the axle. The cold is so intense and penetrating with the high wind, that the stoves have to do their utmost to keep the station habitable. A conflagration at such a time would be almost certain death to the men, for they could not descend the mountain in such weather.

On the 29th of last January there was a sample of this type: a storm-centre had passed the day before; the wind shifted from south to north-west, and rose to one hundred miles an hour, — if the records in recurring round numbers can be accepted as precise, — and at seven o'clock in the morning the temperature was — 32°. At the same time, the temperature at Boston was 0°; at Portland, 2°; and at Montreal, — 9°. The cause of the extreme cold on the mountain is, first, that its winds come rapidly from the cold north-west, without having time to warm up very much on the way; and, second, that they are forced to rise more or less in passing over the mountain, and thus are cooled by expansion about half a degree for every hundred feet of ascent. In other words, the cold is chiefly imported, but is partly a home product. The temperature is not excessively low: it is higher than the records give for the far north-west, and much higher than the minima known in Siberia; but it is harder to bear on account of the terrific winds that accompany it. Residents in Montana and Siberia unite in having a good word for the calm, dry cold of their frigid winters, but no word of praise for the windy cold on Mount Washington appears in the signal-service reports. Other examples of this type, illustrated in the old reports and maps, are Dec. 30, 1873; Jan. 16, 17, 25, 26, 1874.

The second type appears when the mountain stands a moderate distance from a storm-centre, generally to the east or north of it. The temperature is then relatively high, and the weather cloudy or rainy. Jan. 16, 1885, will serve for an example of this. The storm-centre was then to the west of the mountain, but not far away, as the wind was from the south, sixty miles an hour. It was snowing, and the air was nearly 'saturated' with vapor; the air temperature at 7 A.M. being 29°, and the dew-point 28°. At the same time, the temperature at Boston was only 32°, while that at Portland was 24°. Montreal failed to report that morning, but was undoubtedly colder still. Now, if there is any propriety in averages, Mount Washington ought to be in win-