AMERICAN STEAMER FOR CHINA—HER STEAM ENGINE.

Amid the distractions of intestine war and the paralysis of many branches of manufacturing industry, it is gratifying to know that our foreign commerce is extending in various parts of the world. This is especially the case in China, where a number of American mercantile firms have established stations for trading purposes, and they now employ several American river and coasting steamers. The Yankee is becoming the steam carrier for these celebrated regions, and when the vast population of China is taken into consideration—estimated to be 400,000,000 souls—this trade must one day become gigantic in its proportions.

On page No. 39, Vol. V. (new series) SCIENTIFIC AMERICAN, we gave a brief description of the steamer *Shantung*, which was built in this city for the China coast trade, in which it is now engaged, and on Saturday, 1st inst., another beautiful craft—the *Kiang-Tse*—departed for the waters of the Celestial Empire. She is about 1,000 tuns burden, of a beautiful model, and fitted with an overhead beam engine, like that of our river boats. This engine was an object of great interest to a select party of engineers, editors and others who were invited, during the outward trip down the bay, to witness the operations of two different valve motions, with which it had been fitted, and which were arranged to be changed from one to the other, to show the effects of each. The engine has a cylinder fifty inches in diameter, with a stroke of ten feet. It was built by H. Esler & Co., Atlantic Dock Works, Brooklyn, and is a substantial and excellent piece of mechanism. The two valve motions with which it has been fitted are the Winter cut-off and the Dickerson & Sickles improved cut-off. Winter's cut-off was applied first, and was said to be as perfect as it could be arranged. The Dickerson & Sickles cut-off is more complex, but it is claimed for it that a saving of about thirty per cent in fuel is effected by its use. The *Kiang-Tse* started with this valve motion in operation, and when under regular and full headway, the wheel made sixteen revolutions per minute, and the motion of the machinery was very smooth—no jarring action being experienced. After thus running for a little over half an hour Winter's valve motion was "hooked on," when a violent pounding motion in the cylinder was felt, and the revolutions were reduced from sixteen to fourteen per minute. In both cases the firing was the same. With the Dickerson & Sickle cut-off the steam is admitted very gently at first, then it opens full, and closes instantaneously. The steam was cut off at three feet, and expansion was carried out during the rest of the stroke. Several engineers who were present stated that the Winter cut-off was not so well adjusted as it might be, with regard to lead in the valve. Mr. Dickerson stated that although his improvement effected a considerable saving over the other, it was but very small compared with what might be saved in the steam engine, when it is considered how very little of the entire heat of the fuel is utilized in the very best engine ever constructed. Thus the power of heat in 1 lb. of coal, equal to raising about 12,000,000 lbs. one foot high, if all utilized in a steam engine, would be less than three ounces of coal for a horse power, whereas the engine of the *Kiang-Tse* required three and a half pounds of coal with the Winter cut-off, and with the other cut-off the reduction of this amount to two pounds nine ounces, per hour, was, after all, a mere drop in the bucket, as it only amounted to one-eightieth of the entire power which the coal was capable of producing. As a general statement it amounts to this, that the very best steam engines in use do not give more than one-twelfth of the power that is in the coal which they consume. In other words, an Atlantic steamer which burns one hundred tuns of coal per day would only consume eight and one-third tuns, were all the power of the heat in the burning fuel utilized in power. What a field for improvement is still open to the inventor and engineer for economizing the power of the fuel that is consumed in the furnaces of boilers!

CHARCOAL is the best known substance for absorbing foul gases and preventing fetid smells arising from sewers, sinks, &c.

THE Bessemer process of converting pig iron into steel has been introduced into France.

KJOEKKENMOEDDING.

Authentic (profane) history commences about six hundred years before the Christian era. In the beginning the record of events is preserved only in a very small portion of the earth—a little peninsula in the south of Europe, now called Greece. But a preservation of the knowledge of affairs rapidly extended over Europe, Asia and Africa, and finally to America; and for nearly four hundred years history embraces the record of all important events which have occurred in any part of the world.

Great efforts have been made to pierce the darkness which hangs over the early history of our race. The traditions of the Greeks and Romans have been subjected to repeated critical examination, in order to extricate, if possible, some grains of truth from the mass of fable of which these traditions are principally composed. But the more they are examined the less reliable are they found to be. As at the dawn of history the Greeks were found reckoning their dates by Olympiads, and the Romans from the foundation of their city, it would seem as if the date of the first Olympiad and of the foundation of Rome might be fixed with certainty, and the first Olympiad was accordingly placed at 776 before Christ, and the foundation of Rome at 754 B. C. But there is great difference of opinion among critics in regard to the correctness of even these dates, and Niebuhr and Grote, who are among the latest and most learned historians, have brushed away almost the last remnants of the early traditions of Greece and Rome.

A more reliable history has been deciphered by Champolion, Bunsen and others from the inscriptions and paintings which are found in the tombs and temples of Egypt, and a succession of reigns has been traced back 3,800 years before the Christian era. But this is scarcely more than a stony skeleton of history, curiously containing, however, some minute pictures of the arts, manners, customs and social life of the ancient people who inhabited the valley of the Nile, and who probably led for many centuries the slow march of human civilization.

The last Smithsonian report contains an article by A. Morlot, of Lausanne, Switzerland, giving an account of certain discoveries recently made in Denmark and Switzerland, which afford us some positive knowledge of the inhabitants of those countries long previous to historic times. On the sea coast of Denmark are found broad heaps of shells which a close examination shows to have been collected by a very low class of savages. The writer of this has seen on the shores of the Pacific similar heaps of shells which were accumulated by successive generations of the degraded Digger Indians of California. They had eaten the shell fish and thrown the shells upon the ground. That the Danish shell heaps are artificial accumulations, and not natural deposits, is shown by several circumstances. Shells of adult individuals only are found, while natural deposits contain the young as well as the old of each species. There are also found in the same heap species which do not inhabit the same locality. Furthermore, the heaps are not stratified, and with the shells are found roughly fashioned instruments of silex, coarse pottery, charcoal, cinders and numerous bones of animals which have been manifestly split open artificially. These shell heaps are unquestionably the refuse of the meals of savages, and they are called by the learned Danes *Kjoekkenmoedding*, from *kjoekken*—kitchen, and *moedding*—refuse. Since 1847 these shell heaps have been subjected to a most rigid examination by some of the ablest geologists and archæologists of Denmark. Nearly 10,000 specimens of bones and other articles have been collected and labeled, and are now preserved in a properly classified arrangement. The most interesting facts developed by this examination are, that the heaps contain no metallic instrument of any kind, and no bones of any domestic animal except the dog, showing clearly a very low state of savage life. No charred remains of wheat or other grain have been discovered, indicating an absence of agriculture.

We are apt to wonder at the closeness of observation displayed by the Indian, and his shrewdness in drawing inferences from what he sees. But in both of these qualities—in minuteness and accuracy of observation, and in the power of drawing correct conclusions—the Indian is a mere child when compared with the masters of modern science. This is strikingly shown in the methods employed by Forchhammer and his colleagues in their investigations of the shell heaps of Denmark, and in the results of their investigation. We have already spoken of the proofs that these heaps were collected by human beings; that these beings were in the lowest state of savage life, that they were unacquainted with the use of any metal; that they had subdued to their service the dog and no other animal; and that finally they probably had not learned the art of cultivating the earth. Some of the other facts observed and the inferences from them are curious and interesting.

The species of shell found in largest number is that of the oyster, but the oyster has become extinct on those shores from the gradual freshening of the water, and this fact indicates a remote antiquity for the shellfish eaters. As the oysters can be collected only by raking them up from pretty deep water, these ancient savages must have known how to make boats; but, without the use of iron or other metal, their boats could have been only canoes, formed of trunks of trees hollowed by means of fire, or made of bark, like those of the North American Indians.

The bones which contained marrow are all split in a very ingenious manner, and, as the inhabitants of Lapland now split bones in the same manner for the purpose of procuring the marrow, it is inferred that this was the motive for the operation in those ancient times.

Comparative anatomy enables all the bones to be identified with absolute certainty. The most numerous are those of the deer, the roebuck and the wild boar, but bones of the beaver, wolf, fox, lynx, wildcat and others are also found. The presence of the bones of the swan proves that the inhabitants dwelt in the country during the winter, as the swan migrates to higher latitudes on the approach of warm weather.

No human bones are found, but the existence of enormous tombs belonging to this age of stone shows the great respect which was paid to the remains of the dead, and accounts satisfactorily for the absence of human bones among their kitchen refuse. This absence shows that these savages were not cannibals. The remains of human industry found in the shell heaps are exceedingly rude—coarse pottery which was not formed on a wheel, and pieces of flint roughly chipped into forms manifestly intended for knives, hatchets and spear heads. From the material of which the implements are formed this period is called the AGE OF STONE.

Evidences have been found of two subsequent periods which, from the materials in use, are called the Age of Bronze and the Age of Iron. As our article is already too long, we shall reserve a description of these to another week.

BARTLETT'S NEW HOT-AIR FURNACE.

On page 113, Vol. IV., SCIENTIFIC AMERICAN, we published an illustration of Bartlett's new gothic furnace for dwellings, &c., which conveys a clear idea of its peculiar construction. During the past winter we have had some practical experience in the use of the invention, which fully justifies the high opinion concerning its merits which we had previously expressed. This furnace has few joints, and these, by a simple contrivance, always remain gas tight, while the construction is such that the expansion and contraction of the metal cannot even under great heat result in breakage. The gothic top presents a very large area of radiating surface, without any tendency to overheating. For schools, churches stores and dwellings this invention has few equals. Bartlett & Lesley, proprietors, No. 426 Broadway, N. Y.

GREAT PRODUCT OF IRON.—Blast Furnace No. 3, of the Lackawanna Iron and Coal Company, at Scranton, Pa., made, during four weeks, the largest amount of iron ever produced in that length of time by a single furnace in the United States, and probably in the world; the yield of the last week amounting to 375½ tuns. For the week ending Jan. 25, 356 tuns; for the week ending Feb. 1, 342 tuns; for the week ending Feb. 8, 357 tuns; for the week ending Feb. 15, 375 tuns—average, 357½ tuns. This furnace is 50 feet high, 19 feet in diameter at top of boshes, and is blown through 18 tuyeres, with seven pounds pressure of blast.