

Scientific American.

ESTABLISHED 1846.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

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VOLUME XXXV., No. 1. [NEW SERIES.] Thirty-first Year.

NEW YORK, SATURDAY, JULY 1, 1876.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Alloy for models', 'Answers to correspondents', 'Aquarium in New York city', etc., with page numbers.

THE SCIENTIFIC AMERICAN SUPPLEMENT.

Vol. II., No. 1.

For the Week ending July 1, 1876.

TABLE OF CONTENTS.

Table listing contents of the supplement, including 'THE INTERNATIONAL EXHIBITION OF 1876', 'ENGINEERING AND MECHANICS', 'ELECTRICITY, LIGHT HEAT, ETC.', 'CHEMISTRY AND METALLURGY', and 'AGRICULTURAL AND MISCELLANEOUS'.

The Scientific American Supplement

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NEW INVESTIGATIONS ON THE EARTH'S HEAT.

The theory ordinarily accepted as accounting for the creation and present condition of the earth is based on nebular hypothesis, and assumes that the globe, at one time gaseous, subsequently became molten, and is in that state now, with the exception of a comparatively thin crust, estimated to be about 60 miles in thickness. Our knowledge of the interior condition of the earth, however, is mainly speculative; and the strongest support to the above theory is met with in the increase of temperature noted on descending into mines and like excavations.

We have said that our knowledge is but speculative, and its principal confirmation is found in the fact that, wherever excavations have been made, the increase of temperature noted is met with. From this, however, it follows that, if the interior of the globe is in a state of fusion, the relative distances necessary to descend in order to produce like augmentations of heat must be comparatively less as the center of the earth is approached.

Recent investigations by Professor Mohr, of Bonne, at the deepest well in the world, have adduced results altogether at variance with the preconceived estimates referred to above, and which, if hereafter substantiated in other localities, will tend to throw grave doubts on the igneous theory of the earth.

Table showing depth (700 feet, 900 feet, 1,100 feet, etc.) and corresponding thermometer readings (Réaumur) and increase per 100 feet.

The third column decreases in arithmetical proportion, showing for each descent of 100 feet equal differences of 0.050° or 1/20° Réaumur, equal to 0.11° Fah. Applying this ratio to the depths below 700 feet, and between 2,100 and 3,390 feet, Professor Mohr forms a table as follows:

Table showing depth (100 to 200 feet, 200 to 300 feet, etc.) and corresponding increase per 100 feet (1.35°, 1.30°, etc.).

Continuing this, the author finally determines that, at a depth of 5,170 feet, there will be no further increase of temperature, and that the heat indicated at that distance will be true to the center of the earth.

WORKING MEN'S HOMES.—SIR SYDNEY WATERLOW'S LONDON ENTERPRISE.

The problem of providing healthy and comfortable homes for the working classes is one with which students of social science have largely dealt in Europe, and one which, ere very long, must in this country demand earnest and thoughtful consideration. It is an undeniable fact that, so long as working men are compelled to live in the vicinity of squalor or filth, or are crowded into tenements where every sanitary precaution is neglected, their condition, both moral and physical, must suffer; and the legitimate result is the injury and depreciation of the class in whose well-being the prosperity of the community in great measure depends.

Relief from the overcrowded tenement is, perhaps, nowhere more needed than in New York. Rapid transit, when gained, will do much towards improving matters by opening cheap homes in the suburbs; but even then an immense number of people will still be obliged to live in the heart of the city. For them, and for their brethren in other populous localities, as well as for working men in factory towns, improved homes are urgently needed; and until the same are

provided, the epidemics which yearly afflict the denizens of tenements, and are due most frequently to foul and impure air, may be expected. Nor can we hope to materially decrease the number of the intemperate so long as the attractions of the bar room are set off against cheerless and comfortless homes.

There are two ways of accomplishing the required end, namely, either the workmen may cooperate or capitalists can promote the matter as an investment. Both plans have been successfully tried in England. It is certain that to wait for philanthropy to do the work is not wise. On one hand, philanthropists like George Peabody, or Peter Cooper, or Baroness Coutts are few and far between; and on the other, a majority of working men possess a feeling of independence to which the notion of accepting any benefit savoring of charity is especially repellent.

Now as to the two practical ways: The practice of cooperation has been a favorite one among English working men for many years, and it has worked marvelous results. It is based on the sound policy of cash payments, and dividing the profits of trade among members. Land and building societies are two of its forms. A working man desiring a house joins a society, who effect the lease for him. Instead of paying his landlord, he pays a certain subscription and interest to the society; and when his subscriptions are paid up, the association buys the house and conveys it to him.

Passing to the second plan, this is also divisible. It may be carried out by individual employers for the benefit of their employees, or by corporations for the benefit of the whole working class in general. The former would be the course in manufacturing villages and towns, the latter in great cities like New York. We can best exemplify the working of both by example. In South Lancashire, the cotton spinning mills of the Messrs. Ashworth have been in operation for some seventy years. Owing a large tract in the vicinity, the proprietors have built complete villages. The cottages are of stone, two stories, and very comfortably arranged. The rentals are at fair prices. The men are paid regularly, and they in turn as regularly pay their rent. Schools are provided. In a word, so well organized and controlled is the great establishment that crime and misery are practically unknown.

So much for single-handed work. Great as are its results, they are exceeded by those achieved by the Industrial Dwellings Company in London. Here is a corporation based on a philanthropic foundation, but conducted on business principles, which render its working a model for future emulation. Some fourteen years ago Sir Sydney H. Waterlow (who, by the way, is now in this country, serving as chairman of the English jury on the Paper and Stationery Department of the Centennial, and to whom we are indebted for the following facts) erected at his own expense a block of dwellings in the heart of London, provided them with every convenience, and rented them to about 80 families at sums sufficient to yield a fair return on the outlay.

The buildings are of brick, ornamented with copings of artificial stone, made on the spot by the company, from Portland cement and coke breeze. This is easily and cheaply molded into tasteful forms, and is remarkably durable. The tenements, which are entirely separate, contain from two to four or five rooms; and every one, whether large or small, contains a compact little kitchen fitted with a range, boiler, clothes chest, and sink, and is provided with an abundance of water. The closets are detached from the tenements, and are separately ventilated. There is also a neat contrivance