

SCIENCE:

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

PUBLISHED BY

N. D. C. HODGES,

47 LAFAYETTE PLACE, NEW YORK.

[Entered at New York Post-Office as second-class mail-matter.]

SUBSCRIPTIONS.—United States and Canada.....		\$3.50 a year.
Great Britain and Europe.....		4.50 a year.
<i>Science Club-rates for the United States and Canada (in one remittance):</i>		
1 subscription 1 year	\$	3.50
2 " 1 year.....		6.00
3 " 1 year.....		8.00
4 " 1 year.....		10.00

Communications will be welcomed from any quarter. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

VOL. XII. NEW YORK, DEC. 28, 1888. No. 308.

CONTENTS:

THE MCAULEY PROCESS OF BURN- ING PULVERIZED FUEL.....	321	THE SCIENTIFIC WORK OF THE JOHNS HOPKINS UNIVERSITY....	329
PROFILES OF THE NICARAGUA AND PANAMA CANALS.....	322	STANLEY AND EMIN PACHA.....	333
THE SPRAGUE ELECTRIC ROAD AT BOSTON.....	324	SCIENTIFIC NEWS IN WASHINGTON.	
MOHAMMEDANISM AND SLAVE- TRADE IN AFRICA.....	325	Ojibwa Folk-Lore.....	333
MENTAL SCIENCE.		Teton Folk-Lore.....	333
Brain and Sociability.....	327	Interesting University Statistics..	334
NOTES AND NEWS.....	327	Attendance upon Colleges and Sci- entific Schools.....	334
EDITORIAL.....	328	HEALTH MATTERS.	
Mohammedanism and Slave-Trade in Africa		Baldness	334
THE ADVANCES IN ELECTRICITY IN 1888	328	Plastering Wines.....	335
		Organic Poisons.....	335
		BOOK-REVIEWS.	
		The Civilisation of Sweden in Heathen Times.....	336
		Experimental Mechanics.....	336
		AMONG THE PUBLISHERS.....	336

WE PRINT at another place in this number a brief account of the spread of Mohammedanism in Africa. While we may consider its influence upon the heathenish tribes of Africa as detrimental, we must not underestimate its vast historical importance. People like the African aborigines are not roused to activity by the teachings of Christian missionaries; the appeals of the Mohammedan dervishes, which instigate their passions and arouse their warlike dispositions, are more likely to raise peaceful tribes to historical importance. The power of Mohammedanism to create commotions of vast historical importance has been frequently shown. It shows itself at present in the whole Sudan, and, notwithstanding the endeavors of all European nations, it is doubtful whether it will be possible to stay its progress and to redeem Africa from the curse of slavery. The existence of slavery is inseparably connected with that of the Mohammedan states. The present endeavors of the European powers which are directed against the East African slave-trade have some chance of success, as there are no inaccessible Mohammedan states in that region, and the slave-trade is kept up principally by a small number of individuals. Cardinal Lavigerie, to whom this movement is partly due, maintains that five hundred trained soldiers marching through the German territory by way of Unyanyembe to Ujdjidi, on Lake Tanganyika, could crush the

slave-trade and disarm and forever disable the Arab slave-merchants; but slave-raids of some form or other will continue to exist until means of conveying goods from the interior to the coast have been found, making unnecessary the use of carriers. It seems, however, that the principal region of slave-trade, that of Sudan, must for a long time remain inaccessible to European influence.

THE ADVANCES IN ELECTRICITY IN 1888.

WHEN we contrast the present state of electric science and industry with their condition a year ago, we are struck with the remarkable advances that have been made, especially in the latter. The most important experiments bearing on the theory of electricity have been those of Hertz on the propagation of electrical disturbances, with investigations by various workers on the effect of light on various electrical phenomena. Hertz has obtained electric oscillations of a very short period, — several hundred millions in a second, — and he has shown that electro-magnet waves caused by them are propagated in the surrounding space, and are reflected and interfere with one another as do waves of light. To those who have not believed the electro-magnetic theory of light, these experiments will be of great importance: for those who have believed the theory, they will add corroborative and strengthening evidence. Our general views of the electric current have been gradually changing; and the idea of the energy of the current being transmitted through the surrounding dielectric, and entering the wire at every point, is changing our methods of treating problems of current propagation and our conceptions as to the mechanical reality that underlies the phenomenon. A number of experiments on the discharge of condensers have been made, notably by Professor Lodge, with a view of developing a theory of lightning, and of providing the best means of guarding against lightning-strokes. There grew out of Professor Lodge's experiments a warm discussion before the British Association, on lightning-conductors, in which there was shown a wide difference of opinion between 'theoretical' and 'practical' men as to the best means of protection against lightning, and the interest aroused promises to be the means of adding largely to our knowledge on the subject. The development of the alternating system of electric lighting has stimulated investigations in that direction, and a number of experiments on self and mutual induction, on induction-coils, etc., have been made.

In the application of electricity the advance has been much more striking, especially in this country. In lighting, the increase in the number of lights has been steady and rapid; and, although no radical improvements nor fundamental discoveries have been made, yet the efficiency of all of the lighting systems has been increased, and the expense reduced. In arc-lighting there have been only changes in detail of the important systems; but the number of new stations being equipped, and that have started in the last year, greatly exceeds the showing made in 1887. Incandescent lighting has progressed still more rapidly. The Edison Company has erected central stations of large capacity — up to a maximum of 50,000 lamps — in New York, Philadelphia, Chicago, and other cities, besides adding to the already long list of smaller stations. They have increased the efficiency of their incandescent lamps, and have perfected their dynamos. The returns of stations using this system have been for the year most satisfactory, and it is stated in some of the technical papers that a large amount of capital — no less than ten million dollars — has been subscribed abroad for the extension of the system. The number of electric motors that have been supplied from central stations has also largely increased. The Westinghouse Company has continued to distribute electricity by the alternating system, and has rivalled the increase of the older Edison Company. The advantages of their system for distributing to scattered points, and even in cities where overhead wires are allowed, and where the lights are not concentrated in a particular neighborhood, — the lighting of stores, halls, theatres, etc., — are apparent. The efficiency of their converters and lamps has been increased, and experiments are being carried on with a view to perfecting some motor that can be used on alternating circuits. Other companies are doing a great deal of business in a quiet way in putting in private installations for factories, offices, etc. There has