

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</i> Club-rates for the United States and Canada (in one remittance):		
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. XIII.

NEW YORK, JAN. 11, 1889.

No. 310.

CONTENTS:

THE CONTINENTAL DYNAMO.....	17	NOTES AND NEWS.....	23
BALL ELECTRIC-LIGHTING SYSTEM..	18	EDITORIAL.....	24
THE "IDEAL" STEAM-ENGINE.....	18	Later News from Emin Pacha. —	
SCIENTIFIC NEWS IN WASHINGTON.		Weather Forecasts. — Interna-	
Does Exposure to the Sun cause		tional Languages.	
the Human Skull to be Harder			
and Thicker?.....	19	BOOK-REVIEWS.	
Diseases of Menagerie Animals ...	20	The American Commonwealth....	24
The Geological Survey.....	20	Aspects of Education.....	25
THE TASK OF STATE WEATHER SER-		The Slöjd in the Service of the	
VICES.....	20	School.....	25
COMMERCIAL GEOGRAPHY.		Manual Training in Elementary	
The Development of Commerce on		Schools for Boys.....	25
the Kongo.....	20	The Roman Catholic Church and	
HEALTH MATTERS.		the School Question.....	25
The Schoolroom as a Factor in Dis-		AMONG THE PUBLISHERS.....	25
ease.....	21	LETTERS TO THE EDITOR.	
Electric Light and Eyes.....	22	Two Discoveries in Human Oste-	
ELECTRICAL NEWS.		ology by the Hemenway Expe-	
The Electric Sugar-Refining Pro-		dition.....	29
cess.....	22	<i>Sylvester Baxter</i>	
The Electric Light in Land War-		The Julien Electric Traction Sys-	
fare.....	22	tem.....	30
An Electric Road for Chattanooga		<i>Wm. Bracken</i>	
The Edison Lamp Patents in Eng-		The Soaring of Birds.....	31
land.....	23	<i>Wm. H. Pickering</i>	
The Daft Motor on the Elevated		The Great Lake Basins of the St.	
Roads.....	23	Lawrence.....	32
		<i>A. T. Drummond</i>	
		Color of Katy-did.....	32
		<i>L. N. Johnson</i>	
		Various Definitions of Manual	
		Training.....	32
		<i>O. M. Brands</i>	
		Color-Blindness.....	32
		<i>Arthur Stevens</i>	

A NUMBER OF REPORTS have been received which dispel the apprehensions in regard to the safety of Emin Pacha. When Osman Digma's letter arrived, announcing the capture of the Equatorial Province, this news did not seem unlikely, as it was known that the Mahdi had sent a large expedition up the Nile to attack Emin; but, as the news came at the moment when Osman expected an attack of the English, it appeared not improbable that the alleged news might be a trap to prevent the English from taking the offensive. A few days ago a Greek trader was reported to have arrived from Khartum with the news that the Mahdi's troops had failed to defeat Emin, and additional favorable news is said to have reached Cairo. It seems that ere long the mystery shrouding the events that have taken place in the region of the upper Nile since November, 1887, will be cleared up.

THOSE WHO CRITICISE the weather forecasts of the Signal Service, and at the same time would like to see discontinued meteorological work which does not directly bear upon practical questions, ought to read carefully the following remarks of Professor Cleveland Abbe, which are found in the preface to his "Treatise on Meteorological Apparatus and Methods:" "Meteorology can only be worthy of a place among the exact sciences in proportion to the improvements in its methods of observation, and to the extent to

which they cover the field of the phenomena. Thus the comparison between theory and observation requires the amount of solar radiation to be known to within 1 per cent, whereas it is at present uncertain by 15 per cent; it requires the temperature of the air to be known within 0.5° F., whereas published observations are not always reliable to within one or two degrees; it requires the general movement of the air to be known, whereas we have only very uncertain records of the stratum below 100 feet, nothing of the stratum between 100 and 3,000 feet, and scanty record of the cloud-stratum between 3,000 and 30,000 feet. Every effort to explain the ordinary phenomena of storms is embarrassed by the fact that assumptions as to the temperature, moisture, and wind have to be made because of the absence of actual observations. Weather-prediction will undoubtedly be more satisfactory when the present round of observations is enlarged so as to include the condition and movement of the great mass of air above us, while at the same time increasing the accuracy of measuring the lowest stratum."

THE COMMITTEE of the American Philosophical Society appointed to consider an international language continues its work. In a supplementary report made last month, the new attempts at forming an artificial international language are criticised, primarily Professor Melville Bell's "World-English." If the report characterizes this attempt as "English written on a new phonetic system," this view seems to be founded on a misunderstanding of Professor Bell's principle, which advocates a simplification of the English grammar somewhat in the sense of the opinions expressed in the first report of the committee. The greater portion of the supplementary report is taken up by restrictions upon the criticisms of Alexander J. Ellis of the Philological Society of London, who advocates the adoption of Volapük. It appears that a considerable number of scientists support the scheme of the American Philosophical Society, — to convene a congress for establishing the principles of such a language, — and that most of them concur in the view that it must have those characteristic features toward which Aryan speech is tending. An artificial language of such kind, if generally adopted, would undoubtedly be of great benefit to scientists, and make many publications, such as Hungarian, Bohemian, Roumanian, etc., available. But there seems little hope that in this period of nationalism the majority of scientists will forego the claim that their language is the language of the most accomplished and most cultured people of the world, and that it has a right to become one of the "world-languages." When this period has passed, English, French, and German will continue to be better means of international intercourse than any artificial language, which is necessarily a dead language, could be.

BOOK-REVIEWS.

The American Commonwealth. By JAMES BRYCE, M.P. London and New York, Macmillan. 2 vols. 12°. \$6.

THIS is pre-eminently the book of the season. It has been so long looked for, and so eagerly anticipated, that it will now be even more eagerly read. Dedicated to two such eminent publicists as Albert Venn Dicey and Thomas Erskine Holland, it is, first of all, a publicist's book; but the style is so clear, and the arrangement so logical, that it can and will be read by thousands of persons in this country whose better instincts stimulate them to improve the quality of their citizenship by studying a careful and impartial account of their national institutions. Professor Bryce's equipment for writing the book is of the highest order, and is not rivalled either in Europe or in this country. As a member of Parliament for Aberdeen and a member of the recent Liberal Ministry, as professor of civil law in the University of Oxford, as a careful and conscientious student of history, and as an accurate and painstaking man of affairs, whose knowledge of America is extraordinarily full and accurate, Professor Bryce combines in himself both the knowledge and the temper necessary to write a treatise on Ameri-