

The plates are accurately drawn and beautifully lithographed, aiding greatly the demonstrations of the text.

The classification adopted by Dr. Allen is that of the late Dr. James Aitken Meigs, to which he called attention some time since in the pages of *SCIENCE*. It has been overlooked even by such writers as Topinard and Sergi, although it anticipated both of them in important points.

The functions which determine the form of the skull are considered by Dr. Allen to be mainly three, the growth of the brain, the interstitial changes in the bones, and the action of the muscles attached to the skull. The last mentioned he justly considers deserves more attention than it has received.

The Memoir is rich in such suggestions and should be consulted by all students of the subject.

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CURRENT NOTES ON METEOROLOGY.

THE HIGHEST KITE ASCENT.

ALTHOUGH *SCIENCE* of October 16th contained a brief note on the recent high kite ascent from Blue Hill Observatory, some further facts as to this record-breaking feat will not be out of place here. Reference has already been made in these notes on previous occasions to the kite work now being done at Blue Hill, and attention has been called to the scientific value of this exploration of the free air. On October 8th all previous kite records were broken by an ascent which carried the meteorograph to a height of 9,375 feet above sea level, the greatest altitude previously attained having been 7,333 feet (see *SCIENCE*, Oct. 2, 1896, 489). The ascent began at 9.52 a. m. and ended at 9.05 p. m. Seven Eddy and two Hargrave kites were used, and more than three miles of wire were paid out. The meteorograph entered and passed through the clouds, as is shown by a record of very dry

air above the clouds. The temperature fell from 46° on the Hill to 20° at an altitude of 9,375 feet above sea level. The pull on the wire was from 20 to 50 pounds at the start and ranged from 50 to 95 pounds at the highest point. The instrumental record was one of the best yet obtained.

The more the probable future of kite meteorology is considered, the more important does this means of exploring the upper air seem to become. The expense is very trifling as compared with the establishment of mountain observatories, or of balloon ascents, and as mechanical appliances are perfected for winding in the wire, and saving labor in other ways, the work of flying the kites will continually grow less arduous, and the heights attained will become greater. If the upper kites are sent up high enough to be out of reach of the varying and irregular currents near the earth's surface, there seems to be no reason for lowering the instrument at night, and if kept up 24 hours at a time, the results would be still more valuable than those now attained. Indeed it may be that continuous records may in time thus be obtained from the upper air by means of kite meteorographs.

WATERSPOUT PHOTOGRAPHS.

WHAT is probably the best photograph of a waterspout ever taken was secured by Mr. J. N. Chamberlain, of Cottage City, Mass., on August 19th, last. On that day, at about 12:45 p. m., a very perfect waterspout, lasting 12 minutes, formed offshore from Cottage City. The photograph is remarkably clear, and brings out in a striking manner the dark clouds overhead, between which and the surface of the ocean is seen the spout, very symmetrically developed and almost exactly perpendicular. The top of the spout is but slightly enlarged, so that the funnel-shaped is not so marked as it is often figured, while at the bottom the disturbance of the surface water of the

ocean results in enlargement of the lower end of the funnel by the formation of an irregularly shaped cloud of vapor or spray. After the disappearance of this waterspout two others, both less perfectly developed, appeared in succession. These were also photographed, but the views are not so striking as in the first case. No authentic scientific account of these waterspouts has, so far as we have seen, been published. The 8 a. m. weather map of August 19th, shows an area of high pressure central north of the Lakes, with cool north and northwest winds over New England. It seems likely, therefore, that these waterspouts were due in part to the low temperatures brought by the winds. Most of the waterspouts which occur over the Gulf Stream in winter are produced under similar conditions of cool offshore northwest winds, although, of course, the temperature contrasts are much more marked in winter than in summer.

SEVEN-DAY THUNDERSTORM PERIODICITY.

KASSNER, of Berlin, has been investigating the matter of thunderstorm periodicity in Germany during the past few years and has reached some interesting results. In 1893 (*Das Wetter*, 1893, 12-16) he found that for the period 1883-92 the thunderstorms of Berlin showed a maximum frequency on Thursdays and a minimum on Mondays. Further study of the records for Berlin from 1830-40 and 1848-92 indicated a Saturday maximum and a Sunday minimum. Polis found that the thunderstorms of Aix-la-Chapelle also had a Saturday maximum and a Sunday minimum. This fact was naturally supposed to be connected in some way with the increased smoke resulting from extensive firing up in factories and foundries on Saturday, when much work often still remains to be done and has to be hurried through, or, as in the case of iron foundries, the

metal is melted on that day in order that it may cool over Sunday. On Sunday, on the other hand, there is little smoke because little use is then made of fires. In *Das Wetter* for August and September, 1896, Kassner has continued his inquiry, using data for other places, and reaches the conclusion that in general the frequency of thunderstorms increases everywhere from Monday to Tuesday, and that a minimum occurs on Thursday or the next adjoining days. In cities with extended industries which require fires on a large scale there is everywhere an increase from Friday to Saturday, and a decrease from Saturday to Sunday, while in places without many factories the reverse is usually the case. The variations in atmospheric electricity are believed to stand in close relation to the variations in the amount of smoke, as previously suggested by Arrhenius and Ekholm (1894).

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NOTES ON INORGANIC CHEMISTRY.

THE manufacture of acetylene, at a low price, from calcium carbide, and its remarkable power as an illuminant, promised rapid development of its production upon a commercial scale. Two schemes are in use for its distribution. In one the plant is local, acetylene being made on the premises where it is used. In the other the acetylene is made on a larger scale and delivered in steel cylinders, condensed under high pressure.

The fact that acetylene is an endothermic compound has given rise to fear that grave danger attends its use, especially when stored in cylinders under high pressure. Hence recent experiments of Berthelot and Vieille (*Comptes Rendus*, CXXIII.: 523) on the explosive properties of acetylene possess considerable interest. They find that, at atmospheric pressure, a decomposition induced by ignition, or by the ex-