which can be speedily utilized at the first opportunity, is here well shown. JOS. F. JAMES.

Cincinnati, April 28.

Prehistoric fishing.

In Professor Rau's interesting work on prehistoric fishing is a series of Indian bone and horn fish-hooks, ending with a figure that I sent him of one found on an early site on the line of Onondaga county, N.Y. I was especially interested in this object; because it was the first thing found there that seemed to show any knowledge of Europeans, although the site was connected with later sites, near by, by several peculiar relics. The general form of the hook, with its distinct barb, was so like some of the present day, that I naturally thought the Indian maker had at least seen a white man's hook. The series in Professor Rau's work gave rise to doubts, as the main difference in this and others figured was in the barb. I was thus led to see the force of Dr. Rau's remark in his introduction: "I would not venture to say that barbed fish-hooks had been unknown in America in ante-Columbian times; I simply state that none have fallen under my notice."

In looking over some drawings of relics made about three years ago, my attention was arrested by one which I had labelled 'horn perforator.' The more I looked, the more the conviction strengthened that it was the barb of a fish-hook. Borrowing the fragment, I drew it again, after careful examination, and then sent the fragment to Dr. Rau for inspection. He says, "It certainly has the appearance of the barb of a fish-hook." The fragment is one inch and five-sixteenths long by about one-twelfth of an inch thick; from the point to the present end of barb, fifteen-sixteenths of an inch; while the width at the barb is about five-sixteenths; that of the shank, one-eighth of an inch. It is very sharp. There seems to have been a defect in the material, which caused the sharp point of the barb to break off, and which weakened the hook itself. This came from an early site where I have gathered many articles myself, and all are clearly prehistoric. The large copper spear figured by me for Dr. Abbott's 'Primitive industries' came from the same field.

Yet I think the New-York Indians seldom used hooks. All the early references are to fishing with nets and spears; and our Indian village sites are seldom on the shores of deep lakes, almost always by streams, or near the shallow rifts of rivers. Stone fish-weirs are not uncommon, probably used as they were farther south. One of three deep bays which I measured was a work of great magnitude. Nets were much used, and I have found the flat sinkers on sites far away from the water. These were small, however. The large ones, measuring six to seven inches across, I have only found on the river-bank.

A small cylindrical sinker of brown sandstone, grooved around the centre, was probably used on a line. The ends are rounded. A rough tube of copper, two and a half inches long by three-fourths in diameter, found by the Oneida River, I have thought might have been attached to a line, as well as the polished stone plummets.

The polished slate arrows of the Seneca and Oswego rivers, and of one part of Lake Champlain, I think may prove to be fish-knives, being much like a double-bladed knife of broad form. They would have been admirable for opening and skinning fish, had savages been so fastidious. W. M. BEAUCHAMP.

The ruddy glow around the sun.

In November, 1883, at the time of the remarkable after-glows, I noticed that there was a broad, reddish ring around the sun even at mid-day. Soon after, I briefly described the appearances in *Nature*. Since then, I have constantly observed this phenomenon. The sky is very bright for about ten degrees from the sun; then comes the ruddy zone about twenty degrees wide, the deepest color being at about the natural distance of halos. My observations show that at this place there are but few days of the year when the chromatic glow is not visible; but it varies in intensity not only from day to day, but even from hour to hour. About a year ago I discovered that an increase in the depth of color preceded a fall in the temperature, and the formation, first of a structureless haze in the upper atmosphere, and, soon after, of cirrhus-clouds. At other times storms came on with no increase in the depth of color. Soon it became evident that the latter cases were when rain fell, and the general temperature was not low. Hail and sometimes snow storms were accompanied by great depth of color. During the summer of 1884, I passed several weeks in Maine. On two occasions the colored zone appeared around the sun as distinctly as it ordinarily does here. Both times the appearance of the glow was followed by violent thunder-storms, with high winds and *hail*.

While temperature would not affect the diffractive power of particles of volcanic dust directly, yet it is possible that at a low temperature the dust particles, on account of the condensation of the air, may be enough nearer to each other to give a perceptibly greater diffractive power to the mass of air in which they are suspended. But so often has an increase in the depth of the circumsolar glow preceded the formation of clouds, that it seems far more probable that the glow is caused by the precipitation of atmospheric moisture at low temperatures. If dust is involved in the process, it is probably only by its increasing the depth of color, or by its facilitating the precipitation of moisture.

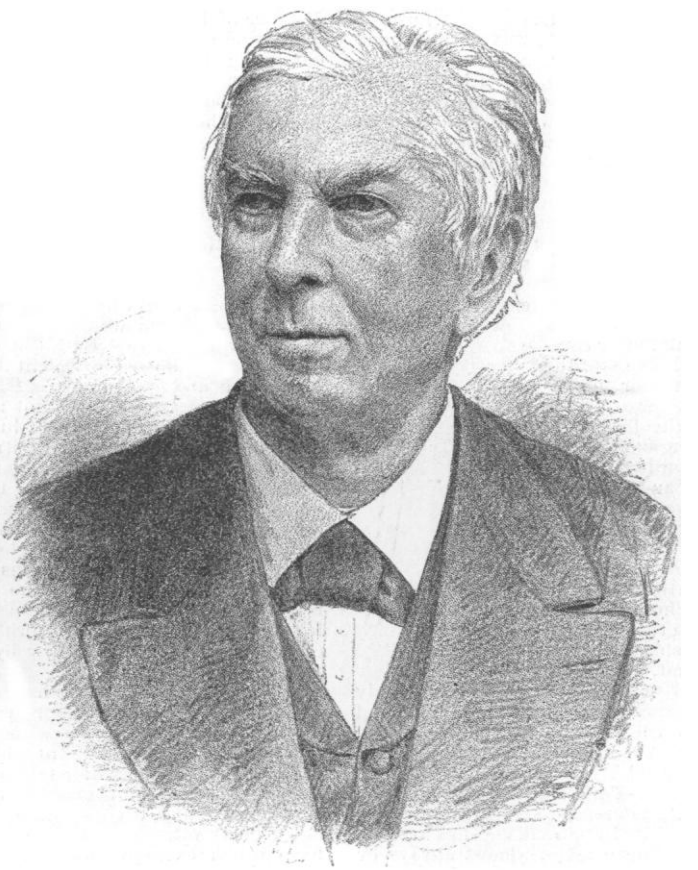
In substance, these views have been expressed verbally to numerous persons for more than a year past. They are published now not merely as a matter of theoretical meteorology, but also for a practical purpose. The observations here recorded make it probable that the glow may be utilized as a prognostication of hail. It goes without saying, that it will be of great value to many, especially to those who have much exposed glass on the roofs of greenhouses, etc., to be able to predict hail and a fall in the temperature. It is true that other localities than those named may not show the same phenomena. The subject is worthy of the careful study of the signal-service, and of meteorologists generally.

G. H. STONE.

CARL THEODOR VON SIEBOLD.

THE death of Carl Theodor Ernst von Siebold, the last survivor of three distinguished brothers, deprives Germany of one of her most honored men of science. His investigations had ceased, owing to illness and the encroach-

ments of age, some time before his death; but his career is a long record of discoveries. He was born at Würzburg, Feb. 16, 1804. His elder brother, Eduard Kaspar Jakob, was a prominent obstetrician, holding a professorship at Göttingen at the time of his death. His still older cousin, Philip Franz (not a brother, as sometimes stated), became distinguished by his very successful scientific journeys in Japan and the Indian Archipelago. Carl Theodor, like Helmholz, and many another of the older German men of science, was educated as a physician, and began life with the practice of his profession, at first in a governmental post as a 'kreisphysikus' in Heilsberg for a year, next as director of the lying-in hospital at Dantzig. In 1840 he definitely entered upon a university career as professor of physiology at Erlangen; and, after several changes, he went to Munich in 1853, and there remained until his death, on the 7th of last April.



His original work has been almost entirely in the field of zoölogy, more especially in the domain of comparative anatomy. His manual of this last-mentioned science is a great masterpiece, a model of truthful and critical compilation, supported by numerous original observations. In this work an immense array of facts are properly co-ordinated, and the whole concisely presented. It is not too much to say of this publication, that it has never been surpassed as an adequate exposition of the contemporary knowledge of comparative anatomy. Siebold's own investigations have been very numerous. His researches on the development of the intestinal worms, and also those on parthenogenesis, opened new fields of thought, and the first-mentioned were of great practical utility to mankind. His monograph on the fresh-water fishes of Europe is the standard authority on the subject. Together with Kölliker, he founded the famous *Zeitschrift für wissenschaftliche zoologie*, a journal of the very highest character. The museum at Munich, of which he had charge, is a beautiful monument to his scientific and judicious administration. Such, in brief, are the long-continued and successful labors of one of the most esteemed veterans of German science, of one whose work and influence have contributed much to give Germany of to-day the intellectual leadership of mankind.