"The author said that the draught diminished as the direction of the wind was more and more downwards, but did not go backwards until the inclination amounted to about 30° . The maximum up-draught would occur, not, as was often supposed, with a direction of wind vertically upwards, but with one making an angle of about 30° with the vertical. A chimney with a T-piece at the top never produced an unfavourable effect on the up draught, and only in one case failed to produce a favourable one. With a T-piece to which was affixed vertical ends, every wind met with would have a favourable effect, and no wind known would have an unfavourable effect.

"Prof. De Chaumont thought that vertical ends increase the resistance of the up-draught, and described a chimney with a lamp-shade-like top and conical cap, with which it was impossible to get a down-draught." G. J. SYMONS,
62, Camden Square, N.W. Registrar Sanitary Institute

Barnard's Comet

I WONDER that more has not been written about Barnard's comet (*f* 1886). On the 9th, at 17h. 50m., in spite of the strong twilight, it was plain with the naked eye as a star. I did not notice its exact brightness, but it was perhaps equal to ρ Virginis. With the telescope its head was about 8' diameter, and it had two faint tails at about position-angles 250° and 300° . The former, which was the brighter at its origin, was $\frac{1}{2}$ long, and was straight; the latter I believe was curved, and was $\frac{1}{2}$ long.

T. W. BACKHOUSE

Sunderland, November 11

Aurora

LAST evening (November 2), between the hours of seven and eight o'clock, a bright aurora was visible in this vicinity. At intervals later in the evening, patches of cirrus clouds in the northern sky became luminous. The disturbance of the suspended magnet was at its height early in the evening, when the aurora was brightest. It is interesting to note the fact that this aurora was twenty-six days removed from that of October 7 and 8, corresponding to the time of the revolution of the sun on his axis. It is noteworthy, also, that very near to the time of the appearance of each aurora there was a slight renewal of earthquake activity in South Carolina and other localities.

Lyons, New York, November 3

M. A. VEEDER

"Lung Sick"

DR. EMIL HOLUB, in writing to me a few months ago from Panda-ma-Tenka, Albert Country, Zambesi, mentions having treated his cattle in a similar manner to that referred to in NATURE of the 11th inst. (p. 29). He says:—

"Shortly after I started northward from the Vaal, a contagious disease broke out among my cattle; there was any amount of sickness among the numerous trains (forty teams a day) going to the Diamond Fields, but I could get no clue to the lameness of the front legs of my bullocks for a long time. Having shot one, the disease proved to be a contagious pleuro-pneumonia, similar to the 'lung sick' so prevalent in this neighbourhood, affecting hips and shoulder-blades, causing lameness. The lungs were partly destroyed, but the animal had but little cough. I disinfected the whole herd, and vaccinated the healthy as well as the sick. The end of the tail was pierced with a narrow-bladed dagger, and a piece of lung full of virus inserted and then bandaged. The second vaccination effectually prevented the spreading of the disease for the whole journey, even in native locations similar to the Bechuanas, in which we were surrounded with 'lung-sick' cattle dying near our encampment."

PHILIP J. BUTLER

55, De Beauvoir Road, London, N., November 13

PAUL BERT

PAUL BERT, who has died at his post as Governor of Tonquin, was born at Auxerre in 1833, graduated Doctor of Medicine in 1863, and Doctor of Science in 1866. Obtaining a professorship in the Faculty of Science at Bordeaux, M. Bert devoted himself especially to physiology, and in 1869 he obtained the Chair of General Physiology in the Faculty of Science at Paris.

He continued here his experiments on the influence of changes of barometric pressure on life, and presented a series of papers on the subject to the Academy of Sciences, which awarded him, in 1875, its great biennial prize of 20,000 francs. He entered political life in 1870, and has all along been known as an advanced Radical. He, however, never lost his interest in science; he did much to promote education in France, and took an active part in the legislative movement which obtained for M. Pasteur an annual pension of 12,000 francs as a national recompense. M. Bert was elected President of the Biological Society in 1878, in succession to Claude Bernard, whose most brilliant pupil he was, and more recently was admitted to the Academy of Sciences. In Gambetta's Cabinet of 1881 he was Minister of Public Instruction, and a few months ago accepted the post of Governor of Tonquin, where one of his most notable acts was the founding of a Tonquinese Academy. M. Bert's papers on "Barometric Pressure" were published as a separate volume in 1877, and his lectures at the Museum of Natural History were in 1869 published under the title of "Leçons sur la Physiologie Comparée de la Respiration." He also issued, in 1869-70, "Notes d'Anatomie et de Physiologie Comparées." For many years he had charge of the scientific department of the *République Française*.

At the sitting of the Academy of Sciences on Monday, the President, M. Jurien de la Gravière, expressed regret that politics had diverted M. Paul Bert from physiology; and M. Vulpian remarked that his death, though glorious for the country, was a calamity for science, his numerous memoirs having placed him among the first physiologists of the age. The Academy adjourned in sign of mourning.

THE RECENT WEATHER

AT the close of a short period of somewhat unusual weather conditions, it may be worth while to call attention to the more prominent features of those conditions.

Cyclonic systems, some of wide, some of small dimensions, have been primarily developed over Western Europe in unusually large numbers. Opportunities for studying those atmospheric conditions from which barometric depressions originate within the area of our European stations are by no means very rare, but they are nevertheless sufficiently scarce to merit careful scrutiny at the hands of every student of weather knowledge. So much is this the case that a meteorologist of eminence made, some years since, the statement that no one had ever been present at the birth of a storm.

Considering the disastrous nature of the floods, the sloppiness of earth and sky, and the general misery in the aspect of things, which characterise the event, few of us can wish to be very frequently spectators of it. But when it occurs, the conditions accompanying it should be carefully attended to. These may perhaps be briefly summarised thus:—

(1) Barometric depressions are primarily developed over a region where atmospheric gradients are slight, the exceptions to this rule being those systems (secondary or subsidiary, as they are termed) which first appear as loops or bulges in the isobars of a large pre-existing cyclone.

(2) They originate either in the rear of a depression which has already passed away or in the inter-space between two large anticyclones, and more especially when the anticyclones are so large that this inter-space constitutes what is called a "trough" of relatively low pressure.

(3) They are preceded and accompanied by an enormous condensation of vapour into cloud.

(4) They do not, at the moment of their birth, appear

to affect the upper currents of the atmosphere, but, if growing large, soon afterwards do so, in such a manner that the hypothetical isobars at the level of the cirrus appear to be bent into a V-shaped hollow from the great polar depression to a point nearly above the centre of the circular depression at the earth's surface.

Of the depressions lately developed near the British Isles and over the south-west of France, the greater number originated in "troughs" of relatively low pressure, such as have been above alluded to: and their movements may be said to have been unusually erratic. Yet they obeyed the ordinary rule of progression, in so travelling, as to have the highest general pressures on the right of their course. Thus, those depressions which originated near the east side of a "trough" lying north-north-west to south-south-east, tended to move to north-north-west, while those which originated on the other side of the "trough" travelled in the contrary direction. On the 10th inst., Great Britain lay between two depressions travelling in parallel but opposite directions, these directions being transverse to the mean direction of movement prevalent at this season of the year. The same phenomenon was repeated on the 12th inst. It is now more than twenty years since I began constructing daily charts of the directions taken by European depressions, and during the whole of that period there has been no instance entirely comparable with these.

We must wait for reports from a very extensive portion of the earth's surface before a comprehensive study of these phenomena can be undertaken. Two questions, so correlated that they may require but a single answer, are of prime importance:—What causes the abnormal, but temporarily persistent, determination of aqueous vapour to certain portions of the globe? What causes the abnormal, but temporarily persistent, occupation of certain portions of the globe by anticyclonic systems?

W. CLEMENT LEY

THE WORK OF THE UNITED STATES FISH COMMISSION

A BRIEF memorandum of what the U.S. Fish Commission hopes to accomplish in time, in connection with its mission, is as follows:—

(1) In the department of investigation and research there is yet to be carried out an exhaustive inquiry into the character, abundance, geographical distribution, and economical qualities of the inhabitants of the waters, both fresh and salt. The subject is practically unlimited in extent, and, so far as the ocean is concerned, has scarcely been touched. With the powerful apparatus, however, at the command of the Commission it is expected that much progress will be made year by year, and that the publication of the results and the distribution of duplicate specimens to colleges and academies in the United States will be carried out on a large scale, so as to meet a large and increasing demand from teachers and students.

(2) A second object, in connection with the sea fisheries, is the improvement of the old methods and apparatus of fishing and the introduction of new ones.

The work of the Commission in bringing to the notice of American fishermen the importance of gill-nets with glass-ball floats for the capture of codfish has already revolutionised the winter cod-fishery industry in New England. Looked upon almost with ridicule by the Gloucester fishermen, when first brought to their notice by the Commission, these nets have come rapidly into use, until at the present time they represent the most important element in the winter fisheries, the number of fish taken being not only much greater than heretofore but the fish themselves of finer quality.

The ability to maintain a successful fishery without the use of bait is of the utmost importance, in view of the fact that when the cod are most abundant bait is almost unprocurable. Other forms of apparatus of less importance have also been introduced, and a constant look-out is maintained, by correspondence and otherwise, in connection with the improvement of fishing machinery.

(3) Another important point for consideration is that of improvement in the pattern of fishing vessels. There is annually a terrible mortality in the fishing crews of New England, especially those belonging to the port of Gloucester, to say nothing of the total loss and wreck of the fishing vessels and their contents. There has gradually developed in connection with the mackerel and cod fisheries of New England a pattern of vessel which, while admirable for speed and beauty of lines and of rig, is less safe under certain emergencies than the more substantial and deeper vessel used abroad, especially in England and Scotland.

The subject of the best form of fishing vessel has been intrusted to Captain Collins, of the Commission, himself a most experienced fisherman, and, after a careful study of the boats of all nations, he has prepared a model which is believed to combine the excellences of both English and American vessels.

An appropriation will be asked from Congress for means to construct an experimental vessel and test its qualities; but until a successful experiment has been made it will be difficult to induce the fishermen to change their present form of construction.

(4) The fourth object of the Commission is to determine the extent and general character of the old fishing localities and to discover new ones. There is no doubt whatever that there still remain many important areas, even in the best-known seas, where the codfish and the halibut will be found in their former abundance. There has never been any formal investigation on this subject, and the banks that are known have been brought to light purely by accident. It is believed that by a systematic research and a careful survey the area of known grounds can be greatly extended.

There is very great reason to hope for successful results from this inquiry in the waters off the South Atlantic coast and in the Gulf of Mexico. These regions, the latter especially, may be considered as practically unknown, the few established localities for good fishing being in very small proportion to what must exist. It is here that the service of the fishing schooner referred to above, if means can be obtained to build it, will be brought into play, and it is not too much to hope that an industry will be developed that will represent to the Southern and South-Western States the same source of income and occupation that the mackerel, cod, and halibut furnish to the fishermen of New England.

(5) There is also much to be learned in the way of curing and packing fish for general and special markets. The American methods have grown up as a matter of routine, and are adapted to only one class of demand. There are, however, many modes of preparation which can be made use of to meet the wants of new markets; and thus we can enter more efficiently into competition with European nations for European trade, as well as for that of the West Indies and South America.

A great advance has already been made towards this desired improvement since the Centennial Exhibition of 1876, where many methods of curing and putting up fish were shown in the foreign sections that were almost entirely unknown in America. Notable among these were the preparations of sardines and other species of herring in oil, as well as in spiced juices. Quite recently this industry has been well established in Maine, amounting to a value of millions of dollars, and there are many other parts of the country where the same work can be done with other kinds of fish. The whole subject is receiving the careful consideration of the Commission, and numer-

* From the "Report of the U.S. Commission of Fish and Fisheries" (Washington, 1885).