COWS KILLED IN THUNDERSTORM.

Our illustration shows the result of the pitiable accident which overtook a herd of cows during a thunderstorm near Plainfield, Ill., last fall. It would seem that the unfortunate creatures had drifted toward a wire fence, when the lightning fell upon a tree standing about thirty feet from the fence, causing the death of twenty-eight of them. As there are no signs whatever on the fence of the direct effect of lightning, it must be supposed that the cows killed fell victims to the so-called return stroke. It is well known that persons standing near a conductor occasionally receive a more or less severe electric shock when the lightning strikes some neighboring object. This is readily explained if we remember that just before the lightning occurs, such a conductor must have been at a high electric potential, which is suddenly reduced enormously by the lightning discharge. A person standing near such a conductor, and not adequately insulated, participates in this sudden change, and the effect is evidently the same as if he received a powerful discharge. Fatal cases of this kind have been noted fairly frequently, but it is very doubtful if such extensive loss of life has ever been recorded before as the result of the phenomenon, and we are not surprised to hear the oldest settlers of the district assert that they never heard of so many cows being killed at a time. Fortunately, no human life was lost, and, happily for the owners, the cows were all insured, and no difficulty arose about the payment. The men who removed the hides from the dead cows remarked that dark streaks could be seen under the skin.

Our illustration, which is prepared from a photograph sent us by an inhabitant of Plainfield, gives a rather impressive view of the scene of the accident soon after its occurrence.

TWENTY-EIGHT COWS KILLED IN A THUNDERSTORM, ILLINOIS.

Saving the African Elephant.

The government of the Congo Free State has taken steps to stop the ruthless slaughter of elephants in Central Africa. At the present rate of extermination the elephant will have become an extinct species in the Free State in eight or ten years.

The foreign correspondent of the New York Times states that an agreement was recently reached between the French National Society for the taming of the African elephant, and the government of the Free State, concerning the measures to be taken to domesticate young elephants. All hope therefore has not been abandoned, notwithstanding numerous fruitless attempts to transform the African elephant, like his Asiatic brother, into a precious help to the explorer and the colonist.

The only pity is that the movement for protection of the elephant should have been started so late, when the race has been almost destroyed.

Felix Fuchs, Vice-Governor of the Congo Free State, who is now in Brussels and on the point of returning to the Congo, states that the destruction of the African elephant was due entirely to the development of the ivory trade. M. Fuchs now proposes that an agreement be reached between Belgium, France, Great Britain and Germany to regulate elephant hunting and to encourage the domestication of the animals. Such an agreement, says M. Fuchs, would have strong chances of being crowned with success. Certainly there is no time to be lost if the last remaining remnants of the species are to be saved. But, once thoroughly domesticated, the African elephant would, like his Indian brother, become, thanks to his strength and intelligence, an important auxiliary in the work of colonization.

The Submarine in Warfare.

The French Naval Department has published the report of the various French commanders who participated in the recent submarine boat maneuvers off Cherbourg, in which they succinctly explain what functions the boats can fulfill and their deficiencies.

The commanders state, as a result of their investigations and experiences, that it will be possible for submarines to leave their stations, and that a hostile squadron will never be in safety at moorings situated within the radius of action of submarines. That watches on board ship are of no avail, and artillery fire is ineffective against this arm. The supervision of anchorage, either by means of torpedo boats or torpedo-boat destroyers, is very difficult, and does not really render the vessel secure against submarines. To insure absolute safety to a squadron, it would be necessary to protect the entrance to a harbor by electric wires. For attacking in the open sea, or in rough weather, submersible boats or autonomous submarines of a large pattern must be employed. Torpedoes carried by destroyers would only be a feeble weapon against submarines, because they could only carry a small quantity of explosives, about twenty kilogrammes, and thus the action of the torpedo would be quite limited. A torpedo exploding at a few yards distance from the hull of a submarine would probably do it no damage. In the course of the French maneuvers it was demonstrated that Admiral Makaroff's invention, which comprises a microphonic apparatus, is almost useless. The indications given by it were in every case insufficient. It was also proved that it is perfectly possible to arrange at the entrance to a harbor an instrument indicating changes of position, but it affords little aid to the defense of an anchorage, and absolutely none at all to a vessel at sea.

A New Flashing Lighthouse Light Without Intervals of Darkness.

BY THE LONDON CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

During the recent meeting of the British Association at Belfast, a practical demonstration was given of a new and ingenious type of lighthouse light, the characteristic of which is that there are no intervals of darkness between the flashes. In this contrivance, which is the invention of Mr. Wigham, the well-known lighthouse engineer of Dublin, Ireland, the lenses revolve at a given speed so proportioned to the diameter of the illuminant, and the lenticular apparatus, that the light is made to show continually, not as a series of flashes and then a period of darkness, but a continuity of flashes without any intermission or interval of darkness whatever.

The numerous advantages of such a light to a mariner are obvious. A fixed light enables the sailor to take a bearing from it in a way that is not possible under all circumstances with a revolving light, but the result is not satisfactory or reliable with an ordinary fixed light, unless the beam is as powerful as that which proceeds from an annular revolving lens. Heretofore this combination has not been possible to assist the mariner. In looking at a revolving light in order to take his bearing, the sailor has to watch closely the length of time during which, according to the nautical instructions, the light should be invisible, and this exact time is not always easy to ascertain, especially in hazy or rainy weather. Moreover, in observing recurring lights, the beam seldom seems to reappear in the exact position from which it disappeared, owing to the insensible wandering of the eye during the time of darkness, and in thick weather the recurring of the light may be altogether invisible.

The first apparatus which Mr. Wigham devised for the provision of a continuous light was one in which the illuminant was placed in the focus of four lenses, but he has now effected a vast improvement by surrounding the light with eight lenses.

When the light of the illuminant falls upon each of the eight lenses, and the rate of their rotation is sufficiently fast, the flashes follow one another with such rapidity that the impression on the eye of each flash replaces that made by the flash immediately preceding it with definite distinctness; that is, before the impression of the first beam leaves the eye, the second flash without any diminution of power takes its place, and thus the flashes are made continuous, and the light is shown without any interval of darkness. The substituting of one image for the other causes perfectly distinct pulsations, and yet involves no perceptible interval of darkness between the flashes.

It is an incontrovertible fact that the more lights are rendered more distinguishable from one another, the better it is for navigation purposes, owing to the abundance of different lights visible to the mariner, such as lightships, beacon lights, guiding lights to harbors, and so forth. It is imperative that lights of a characteristic appearance should be placed in important positions, so that at a glance they may be seen, and their character and position immediately and easily determined, without incurring any risk of error.

The new Wigham light amply fulfills this condition. It is entirely different from all other lights, being neither a fixed nor a revolving, nor an intermittent, nor an occulting light. As a matter of fact, it is in reality a combination of all these systems, possessing an illuminating power equal to the most powerful, but of so distinctive an appearance as to be at once recognizable from every other light.

Although while in one respect the flashes of the Wigham light are of the nature of lightning flashes, being very rapid and very powerful, yet the apparatus that is used is not of such dimensions as to produce flashes equal in intensity to those from great "feu eclair" lighthouses, such as, for example, Havre and Ushant; but if this light were used in a lighthouse as important as either of the above, it would doubtless be in triform or quadriform, and the power of the light, thus increased threefold or fourfold, would fully equal that due to the action of the larger and more powerful refracting lenses of the "feu eclair;" and while the light would have three or four times the power of an ordinary revolving light, it would have the salient advantage over the "feu eclair," or any other system of revolving lights, that it would have no period of darkness, but would shine continually and *always* present the same appearance to the eye of the mariner, enabling him to take his bearings with great ease and certainty.

In connection with the mechanical revolution of the light, this action of the lenses is not assisted by being placed on rollers and race plates, as is the case in ordinary revolving lights. The friction of such an arrangement would be prohibitory to sufficient rapidity of revolution. Instead, the lenses are mounted on a framing concentrated on a pivot and so balanced on the framing as to be almost entirely free from friction. In the case of triform and quadriform arrangements, the weight of the apparatus is considerable, and to obtain efficient working it would probably be necessary to float the whole apparatus in a mercury cup, so as to reduce the friction to a minimum, as is done in the French "feu eclair" light. The friction being so small, very little power is required to revolve the lenticular apparatus. Its revolution can be effected by a small gas or oil engine, by an electric motor if more convenient, or the weights and clockworks ordinarily used in lighthouses.

An important consideration in all lighthouse lights is cost; but no such consideration is necessary in connection with the Wigham light, since the expense of this light is no greater than that of any other first-class light with revolving annular lenses, and is much less than the "feu eclair" system, which requires for its exhibition specially constructed optical apparatus of a very expensive description. Nor does the question of the cost of the illuminant arise, for any known illuminant may be used, the peculiarity of the appearance of the flashes being due not to the nature of the illuminant, but to the design of the lenticular apparatus and the manner in which it is applied.

Steel Furniture for Warships.

The new cruiser "Baltimore" will be the first warship to be fitted with steel furniture. Naval Constructor Capps and his assistant Constructor Nutting have found that all the essential furniture of a man-of-war can be made of steel. The reason for the use of steel furniture is to be found in the fact that serious damage was done during the war with Spain by the furniture on the ships taking fire.

Some experiments made by H. Schoentjés, of Ghent, with double glazing for windows, which is sometimes adopted with a view to reduce loss of heat, show that there is a certain distance of separation between the glasses at which the heat lost is a minimum. The glass used in his experiments was 2 millimeters (.079 inch) thick, and the loss was least when the distance between the opposing sheets was somewhere between 67 millimeters and 117 millimeters (2.64 inches to 4.61 inches). With double walls at the best distance apart the rate of loss as compared with single walls was about halved.