that branch of science which interprets, co-ordinates, and finally applies the results of science to problems of live stock production.

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Oct. 16.

Highest Recorded Shade Temperature.

IN the issue of NATURE for Sept. 6, 1930, at the bottom of page 386, appears an item, "Sept. 13, 1922. Highest Recorded Temperature."

The validity of the reading at Azizia has been questioned by so eminent an authority as Dr. G. Hellmann—see *Monthly Weather Review*, May 1930, page 208. Weather Bureau authorities are of opinion that the Azizia record of maximum temperature cannot be classed as having been obtained under standard conditions of exposure. We are not unmindful of the fact that it is a difficult matter to determine the maximum temperature in a shelter situated in a desert region. The chief evidence against the Azizia record is the fact that it is not supported by the readings of other thermometers in the same region, as pointed out by Dr. Hellmann, and was independently developed by the Weather Bureau climatologists.

A. J. HENRY.

U.S. Weather Bureau,
Washington, Sept. 24.

THE observations at Azizia were published by Prof. F. Eredia in 1923 (*Roma, Boll. Inform. econ.*, 1923, No. 5). After describing the site, in a plain surrounded by hills, he tells how a complete meteorological station, including registering instruments, was established in 1913, of a permanent character, *similar to the other stations installed at various places in Tripolitania.* He adds that during the period when he lived at Azizia, he determined the frequency of high temperatures from hourly observations and also from the readings of a thermograph at a temporary station near by. Referring to the figure of 58° C. (136° F.) on Sept. 13, 1922, he notes that it occurred during a period of south-west winds and almost cloudless sky. He evidently accepts the reading as correct.

I was aware of Hellmann's criticism, but in view of the above summary, and the fact that Prof. Eredia is a competent meteorologist, I concluded that the high readings were probably due to the nature of the surroundings rather than to any defect of instruments or screen. An analogous case in England was described by Miss E. H. Geake (*Meteorological Magazine*, **61**, p. 78; 1926). The lowest screen minima at Garforth, Yorks, are 15°-25° F. lower than those at surrounding stations, and this is entirely due to the local exposure!

The maximum at Azizia is only 2° F. higher than that at Death Valley, California (see NATURE, vol. 126, p. 81; 1930), which is accepted as correct by the U.S. Weather Bureau. Both stations are in depressions in arid sub-tropical regions, and both maxima are isolated readings, for the 225 stations in California for which data appear in the *Monthly Weather Review* for July 1913 do not show any other maximum exceeding 119° F. To complete the parallel, both are criticised by Hellmann as too high. To my mind, the fact that the two maxima are so nearly identical is a reason for accepting both of them.

THE COMPILER.

Ball Lightning.

A CASE of globular or ball lightning was reported to me at East Hampton last summer, and I had an opportunity of questioning an eye-witness and investigating the premises. This account has value only for comparison with other cases, and I presume someone is making a collection of reports of this nature and studying the conditions under which the phenomenon occurs.

A large modern summer residence was struck twice within fifteen minutes. The owner was standing at a window watching the approaching storm, which came up over the ocean. He states that the flashes struck in the water, coming nearer and nearer, like advancing shell-fire; then a flash to the sand dune between his house and the ocean, another in the intervening field a hundred yards from the house, and a few seconds later he found himself 'coming to' in a dazed and very shaky condition. The chimney had been struck and blown to pieces, and his arm was resting on the mantelpiece over the fireplace. He saw no flash and heard nothing, though he did not fall. Fifteen minutes later, a second bombardment commenced, and a flash struck and melted the telephone wire just outside the house, following the wires into the cellar under the kitchen, and apparently dissipating its energy among a maze of criss-crossing bell wires and furnace pipes below the kitchen floor. The thin asbestos covering of one of the pipes had been burst open in places as if by small charges of an explosive.

The ball discharge appeared in the kitchen in the centre of the room (just over the furnace pipes), about three feet above the floor, and within three or four feet of the cook, who was standing up and facing the point at which it appeared. She told me that it appeared just after the thunder crash, was yellow like a flame, about five inches in diameter, and was spinning like a top. She was very positive about the whirling, and was looking down on the thing at very close range. I asked her whether it faded away or exploded. She said, "I didn't wait to see—I jumped for the cellar door and ran down the stairs"! There was no sound of an explosion. She also stated that the room was full of a smoky haze when she returned, and that there was a strong smell. I asked her whether it was 'like sulphur' (the popular description), and she said, "No, it was acid-like." This suggests an oxide of nitrogen. No marks of the flash could be found in the kitchen, but there had evidently been a heavy electrical disturbance below the floor. The cook was near enough to the ball to touch it, and it is regrettable that she neglected the opportunity of making a valuable contribution to our knowledge of this mysterious electrical phenomenon! I think that I should have reached for it, but am not sure.

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Separation of Antibodies from the Serum Proteins.

ANTIBODIES are as a rule associated with serum proteins. In view of both the high theoretical and clinical importance, a large amount of work has been done in order to obtain protein-free antibodies. The failure of these endeavours has led to the assumption that antibodies are either themselves proteins or that they are in some way closely bound to proteins.

In experiments carried out with diphtheria antitoxin and antityphoid serum, we have succeeded in obtaining active antibodies chemically free from proteins. These results were obtained by the method of adsorption and specific elution developed in their recent