an assignment of all options held by the company on the Brunson property, the site of the falls. Upon receipt of the rejection of his offer, Mr. Cammack stated that papers in a condemnation suit are being prepared and will be filed at an early date, seeking to condemn Cumberland Falls and the acreage owned by the power company for state park purposes. The offer to the power company, he explained, was made under an act of the 1930 legislature accepting an offer of Mr. T. Coleman du Pont to donate $230,000 to acquire the falls for a state park.

FROM Science Service we learn that a series of gorgeous waterfalls never before seen by a European and practically unknown to natives have been discovered in South Africa by Farquhar B. Macrae, of the Northern Rhodesian Civil Service, and described by him in a report to the Royal Geographical Society. One of the falls is 200 feet in height, or 33 feet higher than the Niagara Falls, and rivals in beauty the famous Victoria Falls which are about twenty miles distant. This fall is, however, only one of a series following each other in rapid succession so that the total effect is that of a much greater drop totaling 334 feet. They are known to the natives as the Chiengkwasi Falls and are on the Chunga River which empties into the Zambezi. It is on the Zambezi River that the Victoria Falls are located. In describing the Chiengkwasi, Mr. Macrae says: "The main Chiengkwasi fall is a fine sight. Numerous very green ferns grow in holes and cracks in the stone and the water dashes down over the smooth face of the rock, spurting out in little plumes of spray wherever it meets an obstacle. In times of flood it must be an awe-inspiring sight during the few hours that such a short river would remain at its maximum height." A few miles from the Chiengkwasi Mr. Macrae found another impressive series of five falls. The largest of these was a drop of 83 feet. "Below this fall the scenery is most imposing. Towering basalt precipices rise on either side of the river, which is never much more than 100 feet broad and is generally considerably narrower. At one point the cliffs can not well be less than 400 feet high and are probably higher. They rise in a sheer wall from the water's edge. The general impression of height is greater than that conveyed to an observer standing at the bottom of the Palm Grove at the Victoria Falls."

ACCORDING to the French correspondent of the *Journal* of the American Medical Association a recent report shows that the new branch of the Pasteur Institute established some time ago, at Kindia, French Guinea, is developing in an excellent manner. The branch was created after long and patient effort. Professor Calmette in 1913 decided to establish the branch but the outbreak of the war postponed the plan. Originally the idea was to create merely a station for the collection of anthropoid apes destined for shipment to France for laboratory experiments and for a close inspection of the apes before transporting them, for in the past many animals have arrived in Europe in a tuberculous state. After the war the project was taken up, and the government of French West Africa offered 35 hectares of land in a healthful region, 7 kilometers from Kindia, which is located 150 kilometers from the coast, on the railway running from Konakri to the Niger. Since that time a number of buildings have been erected. The central building comprises the laboratory and the lodgings of the director and of transient guests. There are animal quarters, cabins for the native employees and a factory with electrically driven machinery. Eighteen hectares are under cultivation to produce food for the men and the animals. Apes of all kinds are captured and given quarters at Kindia, some for experimentation on the ground, and others for transport in sound condition to the Pasteur Institute in Paris. The laboratory, utilizing cattle and small animals, prepares various serums, among others the antiplague serum. Studies are carried on in connection with antituberculosis vaccination in apes, the inoculation of apes with human malaria and its treatment, the artificial production of cancer (thus far, without results), the spirochetoses of the ape, pneumococcosis, rabies and anthrax. This laboratory has the advantage of having for experimentation animals living in their native habitat, protected against the diseases that beset them in the laboratories of Europe. The directing personnel consists of Colonel Wilbert, veterinarian; an assistant director, and a physician of the colonial forces. There are from seventy to eighty native employees.

DISCUSSION

SALINE DRINKING WATER AND ABNORMAL LIVESTOCK

IN the May 30, 1930, issue of SCIENCE, Ira S. Allison attributes the poor development and abnormal condition of the livestock in western Minnesota to the high sulphate content of the water in this region. Dr. Allison is entirely correct in his statements regarding the condition of the livestock and the general correlation of this fact with excessive sulphates in the water, but his conclusion that this relationship is one of cause and effect is not borne out by numerous

facts. We have shown[1] both under practical and experimental conditions that the trouble is primarily one of phosphorus deficiency. We have demonstrated that it can be entirely prevented and completely cured by the continuous use of sufficient phosphate supplement in the ration. Apparently worthless cattle have become valuable producers after their cure. Limestone has practically no value in alleviating the conditions because it is rare to find animals in this region suffering from calcium deficiency. Bone meal, wheat bran, cottonseed meal and other feeds are effective because of their high phosphorus content. These facts are supported by the observations of Alway,[2] who finds that "phosphate hunger of the soils is very common and wide-spread" in the same region.

We do not wish to give the impression that the sulphate content of the water is of no importance in the difficulties mentioned. Ever since our investigation of this problem began in 1923 we have been trying to determine to what extent the excessive amount of magnesium sulphate in many samples of water in the affected region is a factor in augmenting the poor condition of the livestock. Although it was very clear from our first studies that this could not be the major factor, we have obtained some experimental evidence that magnesium sulphate may at times be of minor importance. However, the phosphorus deficiency overshadows it so greatly that we are no longer concerned with the water as a major contributing factor.

Readers who are not familiar with this problem may be interested to know that the regions of phosphorus-deficient soil and correspondingly poor livestock are not confined to Minnesota, North Dakota and Montana, mentioned by Dr. Allison. Similar conditions have been reported on the coastal plain of Texas, on both the Wisconsin and Michigan sides of Lake Michigan and in limited areas in New York. There is some evidence that the trouble occurs in the irrigated section of the Southwest and intermountain region. It is also rather common in other parts of the world—in Europe, Africa, Australia and New Zealand. The investigations of phosphorus deficiency in South Africa by Theiler[3] are the only ones comparable in extensiveness to our own studies in Minnesota.

The economic condition of many of the farmers in the affected regions of Minnesota is pitiable. The seriousness of the situation becomes apparent when it is realized that these people have no surplus cash income with which to start alleviating their plight through the purchase of fertilizers or proper feed supplements rich in phosphorus.

L. S. PALMER
C. H. ECKLES

UNIVERSITY OF MINNESOTA,
AGRICULTURAL EXPERIMENT STATION

[1] C. H. Eckles, R. B. Becker and L. S. Palmer, "A Mineral Deficiency in the Rations of Dairy Cattle," Minn. Agr. Exp. Station Bull. 229, 1926; L. S. Palmer and C. H. Eckles, "Effect of Phosphorus Deficient Rations on Blood Composition in Cattle," *Proc. Soc. Exp. Biol. Med.*, 24: 307, 1927; L. S. Palmer, C. H. Eckles and D. J. Schutte, "Magnesium Sulfate as a Factor in Retention of Calcium and Phosphorus in Cattle," *Proc. Soc. Exp. Biol. Med.*, 26: 58, 1928.

[2] F. J. Alway, W. M. Shaw and W. J. Methley, "Phosphoric-acid Content of Crops Grown upon Peat Soils as the Index of the Fertilization Received or Required," *J. Agr. Res.*, 33: 707, 1926.

[3] A. Theiler, "The Cause and Prevention of Lamziekte," *J. Dept. Agr.* (Union S. Africa), 1: 221, 1920.

AGE OF THE HOUNSFIELD BENTONITE

THE Hounsfield bentonite, here defined, has its type section in the small quarry just north of the Dexter-Brownville road two miles east of the town of Dexter, Jefferson County, New York; the township of Hounsfield is a mile south of the locality. In the quarry it occurs as a bed of gray-white, homogeneous clay reaching three eighths inch in thickness lying above the Leray limestone and below the Watertown limestone in the Chaumont formation of Ordovician, upper Black River age. In Ontario the Hounsfield occurs within the intermediate Glenburnie member of the Chaumont near Kingston and in the Coboconk limestone of the Lake Simcoe district; in the upper Mississippi Valley it is found consistently within two feet of the base of the Spechts Ferry member of the Decorah formation; the presence of the bed has been reported in Minnesota and Tennessee.

The fact that the Hounsfield bentonite has been found to occupy the position that it has in the type Black River section establishes a new basis for the correlating of beds in other regions within which the bentonite occurs with those in the type section.

G. MARSHALL KAY

COLUMBIA UNIVERSITY

REGULATION OF BODY TEMPERATURE IN OPOSSUMS OF THE GENUS MARMOSA

RECENTLY in SCIENCE (April 25, 1930) under the title "Banana Stowaways Again," Robert K. Enders records another instance of the small marsupial, genus Marmosa, coming into this country with bananas from Central America. Since they are supposed to feed only on ripe bananas he is perplexed at their ability to withstand such a long journey without food, only green bananas being available, and in a temperature much lower (57° F.) than they are accustomed to in their native habitat.

It has occurred to me that possibly the explanation may be the very fact that they were kept in "cold storage" with a constant temperature of 57° F. during