ducted research in experimentally produced nervous disorders in animals under controlled conditions. The station, with its farm houses converted into laboratories and living quarters for the research staff and its barns modernized, will take care of a population of pedigreed pigs, sheep and other animals which will be built up to provide breeds of diverse temperaments. The behavior of the animals will be studied from birth to death in an attempt to clarify the understanding of the deviations from normal behavior which Pavlov designated as experimental neuroses. The work was started in 1921 by the late Professor Sutherland Simpson, whose special interest was the endocrine organs in health and disease. This work was advanced by employing Pavlov's methods for studying conditioned reflexes. Professor Liddell, a student of Dr. Simpson's, has carried on the work as head of the Physiological Field Station since that time, and with his staff has developed the techniques for studying these reflexes.

DISCUSSION

UPPER CRETACEOUS PLANTS FROM PATAGONIA

EXACTLY thirty years ago I published a brief note in this journal[1] which was inspired by an article by Kurtz,[2] in which he listed some twenty-five species of fossil plants that had been collected by Hauthal at a locality known as Cerro Guido in the Territory of Santa Cruz. Nearly all these plants were identified with well-known northern species that had been described by Heer, Lesquereux and Newberry from the Dakota sandstone of the western United States. Although Kurtz's paper lacked illustrations, it was presented with an air of finality that seemed to stamp it as an important contribution to Mid-Cretaceous plant geography.

I have always been curious about this Cerro Guido flora, especially since it has been my later lot to study a considerable number of collections of fossil plants from a variety of horizons in Patagonia, and since there has been a tendency among Argentine geologists to consider the Cerro Guido flora as probably Tertiary. With the exception of some very imperfect material collected by Simpson as leader of the Scarrett Patagonian Expeditions I have not seen any Upper Cretaceous plants from Patagonia until this last winter, in spite of the large amount of geological activity in this region, At that time I received a small but well-preserved collection from the Argentine Survey that had been made by the mining engineer, A. Paitnitzky.

This came from a locality known as Cerro Baguales on the north side of the valley of Rio Shehuen in Santa Cruz Territory and is from the same general region as the Cerro Guido flora of Kurtz. The name Baguales is the gaucho term for wild horses, and consequently it has been applied indiscriminately to very many places in the Argentine, but the location of the plant outcrop is rather definitely fixed by the river. The Rio Shehuen or Sehuen, often called the Rio Chalia, as by the writer in describing the Tertiary plants collected by the Bailey Willis survey, rises between Lago Viedma and Lago San Martin, and is the main southern tributary of the Rio Chico de Santa Cruz. Its valley is the type region of Ameghino's Sehuen stage or Sehuense.

There has been more unprofitable discussion of the stratigraphy and correlation of the Patagonian section by authors lacking first-hand information of the region than can be said of any other equal area of the earth's surface, largely because of the marvelous succession of vertebrate faunas. Ameghino, their nestor, had all the industry of a Cope and the genius of a Leidy, but his geological correlations with the northern hemisphere were not so happy and not only raised paleontological blood pressures and stimulated the secretion of vast quantities of printer's ink, but also tended to a lack of appreciation of his very great talents as a comparative anatomist.

The Cerro Baguales flora, as previously stated, is not large, and it has been possible to identify but ten species. These represent the genera Gleichenites, Dennstaedtia, Dryopterites, Protophyllocladus, Menispermites, Paranymphaea, Sterculia, Laurophyllum and Myrcia. With the exception of Sterculia and Myrcia, which are equally common from the Mid-Cretaceous to the present, this assemblage would be recognized instantly as of Upper Cretaceous age. All the species are new and, aside from the Cerro Guido plants recorded by Kurtz, there are no Upper Cretaceous plants with which comparisons can be made nearer than Texas, which, although it would not be strictly accurate to say was on the other side of the world, is distant about 90 degrees of latitude.

It has been possible to make fairly reliable comparisons with the Cerro Guido flora by studying the illustrations of the plants which Kurtz recorded as given in the works cited in his bibliography. The results are most interesting. A few will be mentioned, since it will be some time before my completed paper appears in print. The *Gleichenites* aff. *gracilis* Heer

[1] E. W. Berry, SCIENCE, 23: 509–510, 1906.

[2] F. Kurtz. Sobre la existencia de una Dakota-flora en la Patagonia Austro-occidental. Revista Museo de la Plata, tome 10, 18 pp., 1899.

of Kurtz is the new species of Gleichenites from Cerro Baguales; the *Asplenium dicksonianum* Heer of Kurtz is either the Dennstaedtia or the Dryopterites of the new collection, and probably represents both since Heer's species is polymorphic, and one of my genera is based upon fertile material, the sterile being much alike in the two genera; the *Cinnamomum heeri* Lesquereux of Kurtz is my new species of Menispermites; the *Protophyllum* cf. *rugosum* Lesquereux of Kurtz is my Paranymphaea; his *Sassafras acutilobum* Lesquereux, *Liquidambar integrifolium* Lesquereux, and probably some of the other of Lesquereux's species of Sassafras which he records, are the same as my new species of Sterculia from Cerro Baguales; Kurtz's *Salix proteaefolia* Lesq. is one of the two new species of Laurophyllum from Cerro Baguales, and probably includes also what Kurtz called *Quercus primordialis* Lesquereux; the second Laurophyllum from Cerro Baguales appears to be what Kurtz called *Perseophyllum hauthalianum.*

The foregoing seem conclusive, but do not dispose of all the names recorded by Kurtz. One or two comments seem pertinent to the remainder, although these must be regarded as tentative, since they are based upon opinion rather than factual evidence. I regard what Kurtz called *Liriodendron meeki* Lesquereux as a leguminous leaflet and not the same as what passes by this name in the northern hemisphere, which is also probably not related to Liriodendron. Kurtz's seed of Abietites is not related to the pines and probably belongs to some genus of the family Proteaceae. The Sequoia twig is probably of the same nature as the one recorded by Engelhardt from the Tertiary of Chile, *i.e.,* a Podocarpus.

If my conclusions are correct it means that the genera Sassafras, Liquidambar, Quercus, Protophyllum, Liriodendron, Abietites (Pinus ?), and Sequoia remain unknown on the South American continent, either from the Cretaceous or later down to the present. It means that there is no present basis for the concept of over a score of Dakota plants from the northern hemisphere reaching South America in a body and unchanged at near the beginning of the age of flowering plants in Mid-Cretaceous time.

It does not mean that there was not an avenue of land communication between North and South America at some time during the Upper Cretaceous. This is as clear as ever, and the Cerro Baguales flora is distinctly related to, and seems to have been derived from the northern hemisphere, as is also true of the Paleocene and Eocene floras of Patagonia.

As to the exact age of the Cerro Baguales flora it is, as aforesaid, definitely Upper Cretaceous. It seems quite as definitely to belong in the Patagonian stage known as the Salamanca. What precisely this is in the international Upper Cretaceous time-table is not so clear. Kurtz called his Cerro Guido plants Cenomanian, because the Dakota sandstone was then considered to be of that age, although I have long regarded it as Turonian. The most similar plants in the northern hemisphere to those from Cerro Baguales come from horizons usually referred to the Turonian, Emscherian and Aturian stages, but concerning which there are differences of opinion, especially as between the botanical and the zoological evidence, the paleobotanists usually considering the various horizons as about one sub-stage older than do the paleozoologists, although the latter authorities are not always in agreement. My tentative opinion is that this flora is late Emscherian or Aturian in age, and this would also include the Kurtz flora from Cerro Guido.

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OBSERVATION ON EXCITATION OF FIREFLIES BY EXPLOSIONS

THE writer had an opportunity to observe an extraordinary phenomenon of excitability of fireflies by explosions on the Fourth of July, which is worthy of communication so that others who have a similar lucky opportunity may be prepared to make more exact observations or even experiment if located where loud noises can be made without objection.

While resting in his garden during the twilight of the evening of the Fourth to watch the fireflies, which this year have made there a much finer display than usual by their great numbers, the writer was startled by the sudden flashing up of the entire grass plot in front of him when some boys fired cannon crackers in the street in front of the house, about 80 feet away, while before only common firecrackers had been exploded half a long block down the street. In an area twenty by twenty feet directly before him, in which before and after only half a dozen fireflies at the most, usually less, could be observed, between forty and fifty were now counted.

The brilliancy of the spectacle was greatly enhanced by the more rapid flashing of the insects, which was at intervals of the ability to count one-two, while before and after it was at the rate of the count one-two-three-four—or a little slower—with now and then an excited individual flashing at the rate one-two.

A third striking feature was that all the fireflies kept in the grass or darted around just above it, altogether not more than one foot above the ground, and none whatever flew up to a height of ten or more feet, as a few always do under normal conditions.

When the infernal noise stopped after a short interval, probably not more than ten minutes, the entire grass plot, as the rest of the garden, fell into complete