compared with which 5×10^{10} is indeed a short interval.

4. I wrote: "Observations with the spectroscope made *principally* at the Lowell and Mt. Wilson Observatories have shown us that the Andromeda Nebula is approaching us with a speed of 200 miles a second, the Magellanic Clouds are receding from us at the rate of 176 miles per second." It seems inconceivable that any one would be able to read into this sentence the meaning that "the Magellanic Clouds *have recently moved so far north* (italics mine) that their radial velocities can be and have been measured from Mt. Wilson and Flagstaff." The radial velocities of these objects were actually observed at the Chilean station of the Lick Observatory, which might well have been mentioned.

Summing up, I should say that I entirely agree with Dr. Aitken that the writer of a popular article owes it to his readers not to make overbold statements. However, one must consider that in writing a popular article, one can not stop to explain all side issues, by footnote or reference, in the same way as is done in scientific articles; such points are essentially matters of personal judgment.

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ORIGIN OF THE PRAIRIE

PROFESSOR PHILIP M. JONES in SCIENCE for October 7 (Vol. LXVI, No. 1710) suggests as a theory for the origin of prairies in the Middle West "rapid drainage at the close of the ice age."

It is doubtful if this theory, or any other relying upon a single factor, can explain very extensive grassland areas, either in the Middle West or elsewhere.

Treeless areas tend to develop in arid or semiarid regions, or where, even though there may be abundant rainfall, the water table is low by reason of unusually free subsurface drainage. In the latter instance, if indeed not in the former, the presence of a large number of grazing and browsing animals is an important factor. Starting on such "negative oases" these animals are apparently able to beat back the line of forest, even into regions where moisture conditions are not unfavorable to tree growth.

Such a region, apparently, one lying entirely outside of the glaciated district, was that which may be roughly defined as the portion of southern Kentucky and northern Tennessee lying between the Green and Cumberland Rivers. It also extended into southern Illinois. When first visited by white men it was treeless and covered with grass. The writer has seen in a collection of old maps in the Boston library one of this middle western country printed by John Sinex in Amsterdam, Holland (no date, but presumably in 1721) on which this region is designated as the place "where the Illinois hunt cows." This map is evidently a reproduction of an earlier one in which the legends were in French and where the word rendered "cows" in the later edition was undoubtedly "beufs" in the former. A proper rendition of the original inscription is therefore, "where the Illinois (Indians) hunt buffalo." The first description of this country brought back to English colonists of the Atlantic seaboard, was by a party of hunters, led by a German by the name of Casper Mansker, which setting out from North Carolina in 1769 (See Haywood's History of Tennessee) first broke out of the forest in what is now Wayne County, Kentucky, and there saw stretching toward the west a vast expanse of treeless upland, covered with grass, and grazing countless numbers of buffalo, deer and elk. Not yet having been introduced to the French word "prairie" as descriptive of such a region, these hunters called it "meadow land," and a creek at the headwaters of which by a spring they camped, "Meadow Creek." This creek, sinking a short distance below the spring, reappears again, only to plunge by steep descent into the gorge of the Cumberland River. It still bears the name "Meadow Creek." So excellent was the hunting here, and so eager were the hunters to enrich themselves with skins and pelts that they forgot to return to their homes and families in North Carolina for two years. For this when they did return they received the name "The Long Hunters."

When finally opened up for settlement this region was largely "passed up" by the early pioneers as "poor land," in accordance with the mistaken notion of persons acquainted only with the wooded country to the east that a soil that was not supporting trees must be poor indeed. Hence the name "Barrens," by which the region became known by the early part of eighteen hundred, when the Kentucky legislatures of that period wrestled much with the problem of inducing its settlement. One of the offers made to prospective settlers was the remission of taxes for a certain period of years. The early name for the region is still perpetuated in Big and Little Barren Rivers, and in Barren County, Kentucky, situated near the center of the area.

A geologic examination shows the Barrens to have been nearly coextensive with the outcrop of the cavernous limestone of the Mississippian series. It is a karst country abounding in sinks and caves and underground channels through which rain-water readily sinks and finds its way speedily into the major streams of the region. Hence it suffers much in times of drought. Hence also it would appear, that, aided possibly by forest fires, vast herds of buffalo and deer and elk were able to reclaim it from forest and

convert it into "meadow land." It was here that the buffalo last lingered in Kentucky, a few of them having been seen here as late as 1818.

With the settlement of the country and the extermination of the large wild game, the trees, which still lingered along the major streams, and possibly, also, on the tops of the sandstone knobs which are scattered over the region, began in their turn to reclaim the ground from which they had been driven, until now it is so well wooded that a person traversing the region who was unacquainted with its history would naturally conclude that each farm he sees is but the expansion of a clearing won from virgin forest by the axe of the sturdy pioneer, as elsewhere in Kentucky and Tennessee.

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SCIENTIFIC BOOKS

Bodenablagerungen und Entwicklungstypen der Seen. By G. LUNDQVIST. Bd. II of Thienemann's Die Binnengewässer, 1927, 124 pp. 14 pl. Published by E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart.

FOR a number of years Swedish investigators have been studying the bottom deposits of lakes in southern Sweden and much interesting and valuable information has been obtained in these studies. The present volume deals primarily with these investigations. The first part treats of the methods of obtaining samples, including descriptions and figures of the apparatus, with the chemical and microscopical methods of studying the material, and with the system of representing the results by diagrams.

These lacustrine sediments are deposited in thin strata and the annual deposit of pollen makes it possible to trace the history of the beds; in this way it has been ascertained that the period of time covered by them ranges from a few hundred years in some instances to a few thousand years in others.

The relative proportions of the component materials serve to characterize the different types of sediments and a key for their identification is given, together with a series of thirteen microphotographs illustrating them.

The sediments are deposited in the form of beds and there is usually a succession of these beds whose sequence is dependent upon the solubility of the chief constituent of the deposit. In some instances the deposits seem to be homogeneous throughout, but through age determinations and by microfossil analyses it can be readily shown that they consist of a series of beds. Several types of bed sequences are shown by means of diagrams. In addition to chemical and biological factors, the character of the beds is affected by certain dynamic factors, such as wind, currents and exposure to wave-action. The final section deals with the regional distribution of lake types in southern Sweden. A bibliography of sixty-nine titles is given.

Die Tierwelt der Unterirdischen Gewässer. By P. A. CHAPPUIS. Bd. III of Thienemann's Die Binnengewässer, 1927, 175 pp. 70 figs.

This volume deals with the animal population of subterranean waters, such as are found in springs and caves. There are three chief sections which consist of (1) general, (2) faunistic, and (3) biological parts. The general part treats of methods of collecting the fauna, the character of subterranean waters and the characteristic environmental conditions existing therein. The subterranean fauna is divided into three ecological groups, namely, (a) Troglobionte, (b) troglophile, and (c) troglozene forms.

The second part consists of a list of the fauna of subterranean waters together with notes regarding the various forms and their geographical distribution. Mollusca and crustacea furnish the largest variety of forms.

The third part, consisting of fifty pages, treats the morphological adaptations of this fauna and the influence of subterranean life on the various organisms; the effect on the eyes and other sense organs, on the color, size and breeding habits are discussed, together with the origin and age of this fauna and the effect of the glacial period upon it. The bibliography includes 194 titles.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE SPIRALS WITHIN THE TERMITE GUT FOR CLASS USE

INSTRUCTORS in bacteriology often realize that it is not easy on many occasions to find a satisfactory source of spiral-shaped microorganisms for class use. The proper varieties of bivalves are not always available and when one has a sufficient number of these at hand, one can not be certain that one will find satisfactory spiral material within them. Many also have made it a habit to look over students in an endeavor to find a marginal gingivitis since this condition yields most beautiful fields for direct smear or for the dark field. Young people, however, show this disease in rather limited numbers.

One of us (S. F. L.) while making a study of the