decrease, then a more dilute solution would be required to build up the monolayer; should it increase by flattening of the cell or change in its shape, or should adsorbing bodies be formed inside the cell, a more concentrated solution would be necessary to build it. And reciprocally, if it be assumed that the size of the cell is determined somewhat by the possibility of forming, under certain conditions, oriented monolayers of proteins, the slightest change in the concentration, as might be brought about by changes in the pH which affect the solubility of these substances, will determine a change in the ratio $\frac{S}{V}$, and the cell will grow or diminish in size, or alter its shape. Consequently, the normal concentration of biological fluids might be one of the factors determining the size of the living cells. Should our hypothesis be true, they could not exist outside of a certain range of dimensions, and their activity would depend, among other factors, on how near the critical concentration they may be with respect to their ratio $\frac{S}{V}$; indeed, if these three quantities happen to be balanced in such a way as to make the building of monolayers possible, they will be in a constant state of activity, as anything affecting the concentration will change the surface tension, while in turn any phenomenon affecting the surface tension on one point will determine a variation in the ratio $\frac{S}{V}$, which will result in a fluctuation in density in some other part of the cell, with a corresponding change in surface tension.[7] In certain cases, where the externally adsorbed layer seems to be of constant thickness (red cells), the solid oriented layer of adsorbed serum proteins gives a certain rigidity to the cell. This adsorbed layer, the order of magnitude of which is about 40 Ångstroms (40×10^{-8} cm), is probably fixed on an inside layer, the thickness of which can not be computed. Thus the ratio $\frac{S}{V}$ of the inside of the cell may be larger than the outside ratio and correspond to a higher concentration of proteins, not to mention the possibility of inside adsorbing elements.

It is needless to say that the preceding hypothesis is given only tentatively and that the writer does not wish to lay any emphasis on it. However, considering the somewhat striking coincidence of the figures, and the interesting departure from thermodynamic equilibria realized by the formation of oriented layers, it is possible to conceive that phenomena of a similar nature play a part in the still mysterious behavior of cells. It throws no light, however, on the inside structural elements of the cell, and the nucleus, for example, remains unexplained.

P. LECOMTE DU NOUY
THE ROCKEFELLER INSTITUTE

[7] It is usually admitted that the cell content is rather a concentrated solution of proteins. If this is true it becomes necessary to suppose that there is a considerable surface of adsorption inside the cell, in addition to those which can be seen under the microscope.

A NEW AREA OF CARBONIFEROUS ROCKS IN MEXICO

THE locality which furnished the material for this notice was discovered by Mr. Parker A. Robertson, a geologist of the Mexican Gulf Oil Company. He made a small collection at the original locality and later, with Mr. J. M. Muir, a geologist of "La Corona" Compania Mexicana, he made a larger one at a nearby point. The material thus obtained was sent to Dr. L. W. Stephenson, and he, recognizing that the fauna was Carboniferous in age and consequently of less interest to himself than to me, obligingly placed it in my hands for examination. This note is published by the kind permission of the authorities of the Mexican Gulf Oil Company.

The fossil locality is in Peregrina Canyon, eleven kilometers west twenty-two degrees north of Victoria in eastern Mexico, and is remote by at least five hundred miles from any authentic area where Paleozoic rocks have as yet been reported. A possible exception is an unconfirmed occurrence of undivided Carboniferous rocks in the San Carlos Mountains about seventy miles northeast of Peregrina Canyon.[1] This discovery of Mr. Robertson's is of considerable interest, on this score alone, but in addition the fauna is of an age and facies quite unexpected. Had it proved to be Permian or Pennsylvanian, the discovery would have been interesting but not surprising, but the fauna proves to be early Mississippian and of a type less comparable to the contemporaneous faunas of our border states such as the Lake Valley limestone or the Escabrosa limestone, than to faunas of Missouri or of Ohio.

The most characteristic features of the fauna from Peregrina Canyon may be set down here, although a more searching description will be given in another place. The most abundant fossils, probably, belong in the genus *Syringothyris,* and represent three types more or less closely related to species in the lower Mississippian of Iowa and Missouri. A large *Reticularia* scarcely distinguishable from *R. pseudolineata* is also abundant, and *Athyris lamellosa,* though more rare, is highly distinctive. *Spiriferina, Delthyris* and *Chonetes* are present as well, but *Productus* appears to be rare. It is, however, represented by a large species of the semireticulate type, closely resembling a common member of the Waverly fauna of Sciotoville, Ohio. Altogether, the faunal aspect is clearly early Mississippian and probably equivalent in time value to the Burlington and Keokuk of our Mississippian section.

[1] See geologic map of North America, 1911.

The limestone in which the fossils occur has been brought to the surface by a pronounced structural uplift, and reveals the following succession of rocks:

Section in Peregrina Canyon
(By Parker A. Robertson)

	Approximate thickness
	Feet
Cretaceous:	
Medium to heavy bedded limestone	2000
Unconformity (?).	
Cretaceous or Jurassic:	
Medium bedded light gray limestone above, heavy bedded dark gray limestone below	300
Basal conglomerate containing fragments of the underlying red sandstone and quartz pebbles	50
Great unconformity.	
Triassic or Permian:	
Fine-grained rather soft red sandstone	200
Medium bedded red shale, arenaceous in parts	485
Basal conglomerate with fragments of underlying sandstone and quartz pebbles	15
Unconformity.	
Lower Mississippian:	
Medium to heavy bedded dense quartzitic, calcareous sandstone	350
Hard dark shale, containing *fossils of lower Mississippian age*	50
Medium bedded dark gray to black carbonaceous shale interbedded with thin beds of sandstone	750
Unconformity.	
Probably pre-Cambrian:	
Schist, probably metamorphosed sediments	1000
Unconformity (?).	
Heavy bedded rather fine-grained light colored gneiss	1500

GEORGE H. GIRTY
GEOLOGICAL SURVEY,
WASHINGTON, D. C.

THE ASSOCIATION OF AMERICAN GEOGRAPHERS

THE Association of American Geographers held its twenty-second annual meeting at the University of Wisconsin, December 30, 31 and January 1, under the presidency of Professor R. H. Whitbeck. The meeting included six half-day sessions, an evening round table and the annual presidential dinner. Special half-day sessions were devoted, respectively, to "The Caribbean Region," "Field Geography" and "Urban Geography." The papers presented were, on the whole, of high quality. Most of them, in their careful attention to areal and quantitative detail, indicate gratifying progress in method and technique of geographical investigation. The introduced papers clearly demonstrate that scholarly work is being done by the younger group of geographers. The plan adopted of scheduling time for discussion after each paper resulted in vigorous and illuminating discussion, and yet allowed the entire program to go forward on schedule. All the regular sessions were held in Science Hall, and the association is greatly indebted to the Department of Geology and Geography and to the officials of the university for their fine hospitality. For luncheons and the annual dinner the association enjoyed the facilities of the University Club. The feature of the dinner was a scholarly address by President R. H. Whitbeck on the subject of "Adjustments to Environment in South America: an Interplay of Influences."

As an inventory of American geography, this program demonstrated that geographic research of high order is under way at a number of institutions where separate departments have been established recently, or where the subject relatively recently has been introduced under the auspices of some other department. Thus, from the geography department at the University of Michigan, K. C. McMurry gave the results of "A Study in the Use of Soil Types in Geographic Mapping," and Preston E. James read "A Geographical Reconnaissance of Trinidad." From the new department at the University of Minnesota D. H. Davis outlined the "Objectives in a Geographic Field Study of a Community," and Richard Hartshorne presented the "Factors in the Localization of the Iron and Steel Industry." C. C. Huntington, of the department of geography at Ohio State University, discussed "The Main Divisions in the Classification of Geography." From the geographic wing of the department of geology at the University of Illinois, W. O. Blanchard presented "The Landes—a Problem in Conservation," and John B. Appleton summarized the findings of a monograph on "The Calumet Steel District." Lewis F. Thomas, of the department of geology and geography at Washington University, discussed "The Localization of the Wholesale and Jobbing Industries in Metropolitan St. Louis," and Mary J. Lanier, of Wellesley College, in a paper on "The Early Development of Boston as a Commercial Center," presented a notable contribution in the field of historical geography.

That rapid progress is being made in the technique of geographic mapping and in the use of quantitative data in the solution of geographic problems was disclosed by the special session on field geography. Under the title previously mentioned D. H. Davis stated the objectives of a survey for an agricultural community and emphasized the importance of such objectives in orienting the study. Derwent S. Whittlesey, of the University of Chicago, discussed the re-