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Physiography and Plankton in the Lagoons of Buenos Aires

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The pampas that lie to the south and west of the Rio de la Plata and the deltaic portion of the River Paraná contain numerous lagoons. These vary from the size of large ponds to the 12.000 hectares covered by the „Laguna del Monte“ in Guamini. They are always shallow basins and the greatest depth in only a small area of the just mentioned lagoon is 8 meters, the regular soundings in it giving from 3 to 5 meters, and the most of the lagoons in Buenos Aires only gives 3 meters as a maximum depth.

The zone which I study is that one of the Argentine territory limited to the East by the Paraná—la Plata rivers and the Atlantic shores; to the North by the Arroyo del Medio (although it might be extended to the Carcarana) to the South by the Atlantic again and by the dry pampas that precede the Rio Colorado basin; to the West by a provisional line extending from the Rio Quinto marshlands to Laguna Chasicó, the more western lagoons not having been sufficiently studied.

Their waters vary from the type of purely freshwater chemical contents (near to the La Plata river type) on to the extreme chloro-sulphate concentration of the Epecuén lagoon with its 375 grames of residue (salts) per liter.

Considering the relative contents of salts in the different lagoons, a law of distribution cannot be strictly formulated; still, it happens that the extremes are found, thus: in the East, the waters are nearer to the Rio de la Plata type, a water that, after due filtration, is used by the Buenos Aires population; in the South-west the lagoons that show a great salinity, and more to the West, in the limit line I have previously referred to, one finds the salt deposits (sodium chlorid) evidently formed in

shallow basins like the present lagoons. Now it happens that among the real fresh water there appears a western type lagoon; a good example is furnished by Laguna del Gualichu in the Las Flores district, which has got 63 grammes per thousand of saline residue (36 of sodium chloride, 19 of sodium sulphate).

In some lagoons which are connected through channels, brooks, the origin of a river, as it happens in the case of the Salado, there is a gradual increase in the salinity, often towards the West. This even may be the case in the pampean lagoons that are normally isolated one from another but which owing to an overflowing, remain temporarily united. At first their waters acquire similar salinity but gradually their communication may dry up and then their relative salinity is made out more clearly than if they were definitely separated and exhibiting the particular responses to drought, rains, etc. This happens often in the basins disposed „in a line“.

Lagoons of this sort are called „Chained“ or „Yoked“ („Encadenadas“, „Acollaradas“). Good examples of this sort are the Junín lagoons, namely: Chanar, Mar Chiquita, Gómez and Carpincho, and the Guaminí ones, thus: Epecuen, Venado, Monte, Cochicó, and Alsina. I have studied especially the communication between these two last; normally it is a brief, unimportant brook, not a foot deep, running through the grassy plain; in flooded days the waters there attain a depth of 3 meters and miles of expansion over the land. After this of course the difference of salinity and quality of the lagoons waters are attenuated; at the same time plancton and fishes invade the new habitat.

The Guaminí lagoons are especially subject to sudden and copious precipitations, coming from the austral Sierras of Buenos Aires through brooks which normally are small. The same does not happen in Junín or Chascomús (with their several „Chained“ lakes) on account of there not being mountainous ranges in the vicinity, but still they often show a sudden increase in the volume of their waters on account of some sudden torrential rain, a meteorological feature quite characteristic of the humid pampean zone.

No biological study of the Buenos Aires lagoons can be undertaken if this capital fact of their variation is overlooked. In a given year and season they may show a fulness that even invades the neighbouring camps; after this, evaporation tends to diminish their amount of water, favoured by the warm dry

summers, strong winds in such an open country, and the shallowness of the basin; this drying up process can last from 2 to 11 or more years, ending with a renewal of the waters.

This process is more or less cyclical, depending on the pluvial regime. Now, these sudden pluvial climax of which I just have spoken can be general, or local, or, although happening in the same season, they may occur in isolated places. The surplus water may empty in one course or other, according to basins, thalwegs, etc. Thus in Guaminá, over twenty years ago not a single drop of rain had fallen and the vast lagoon of Monte in one half night invaded the outskirts of the city; the slope not being from the west, the near-by lagoon of Cochicó was not affected; but some time later a new flood came from this one, and still it had **not** rained in all the zone corresponding to both lakes.

The lowering of the water level during a dry period causes the concentration of the salts and the precipitation of some of them; the bottom deposits grow and the retiring waters leave a shore line that is often a „salina“ or salt deposit. This last is often washed-in to the lagoon again with the pluvial waters coming from the camps, thus increasing the complex relations of the salinity in different sites.

I have given a special attention to the litoral lagoons and I can briefly state my conclusions saying that in Mar Chiquita, (in the Mar del Plata and Vidal districts) there is a regular communication with the sea and the waters are mostly marine in the southern part of it, but to the North we find fresh water from small rivers that empty in it; in Laguna del Cristiano Muerto (Necochea district) no opening to the sea was found and the waters were slightly brackish, the fauna being freshwater; in the San Blas zone there was no freshwater, the lagoon being of strictly marine type, ending in great deposits after a space of muddy marsh.

The plancton of the lagoons is very little known, there being only some records as to the systematic findings usual in explorations.

I have published several lists of the findings from my materials but now I shall only mention, as an example, Cochicó lagoon in which the Diatom forms were 11 for an average surface, 21 for the shore waters, 21 for the samples obtained with the bottom algae, 18 for the bottom mud. There was a relative variety and richness in forms. On the contrary, the neighbouring

Monte lagoon, with its waters heavily concentrated after a prolonged drought, the Diatoms were scarcely found and almost reduced to *Surirella striatula*.

Some five years ago when studying in a preliminary way the plancton of these lagoons I made a rough estimate of their relative richness in vegetal and animal food for fishes, grouped usually under the name of plancton, although the most of the Diatoms are really neritic. The method used was the decantation of living matter (after formaldehyd fixation) in a given volume of surface water in the same season, winter, and at midday. The number obtained were: Mar Chiquita (Junín) 1,333 per thousand; Cocñicó 0,733; Monte 0,352; in fact, in this last one the fish was in a most poor condition.

Versión Electrónica

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