

followed through proved to be the margin of a polygon. The polygons thus identified were of enormous size averaging 80 to 90 feet in diameter. An uninformed person walking upon the playa would never suspect their presence; the only physical mark upon the surface is a broad faint depression more or less straight and trench-like, averaging 3 feet wide and perhaps an inch or more deep in the middle. Each side of a polygon is a line of fracture and fill which could not be recognized from the air were it not for a concentration of vegetation along these faint grooves. Here, either because of better-growing conditions or the more abundant lodgment of seeds, the plants *Suaeda fruticosa* Forsk., with fleshy leaves of a purplish color, and *Atriplex acanthocarpa* (Torr.) Wat., having fuzzy white leaves and bur-like fruits, are concentrated in greater numbers than upon the areas of the polygons and thus form the black borders which are so effective in outlining the polygons. Both plants are bushy and grow about a foot high. This geologic feature might have remained unnoticed were it not for the striking pattern made by the plants as seen from the air.

The year 1934 was one of extreme but brief drought in southern New Mexico. Inquiry disclosed that at least one resident of Animas Valley had remembered seeing that year open fractures on the parched playa. His recollection was that the openings were narrow but may have been two or three feet deep. They were subsequently filled by collapse and inwash of surface material.

The pattern is probably old, and the ground undoubtedly has suffered repeated opening and filling with every severe drought. But why these polygons have formed on such a grand scale is a point of interest which will be enlarged upon at a more propitious time.

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U. S. GEOLOGICAL SURVEY

#### POLLEN RECORD OF CANADIAN SPRUCE AND FIR FROM TEXAS BOG

A PRELIMINARY pollen analysis of the deep peat deposit (22 feet) in Patschke Bog, Lee County, Texas, gave very significant records on former ranges of boreal conifers and *Castanea* in North America.

Patschke Bog is an old lake, perhaps of the meander type, now filled completely with peat, which rests on fine reddish sand. The peat is extremely black and consists chiefly of finely divided wood fragments. The preliminary pollen study indicates a history of the vegetation showing the following changes in composition: Spruce-pine-oak-grasses, to oak-grasses, to grasses, to alder, to chestnut-alder, to chestnut-oak-grasses, to oak-grasses. The most significant discov-

ery is a record of upward to 5 per cent. of Canadian spruce and fir pollen in the lower five foot-levels. *Castanea* attained a pollen representation of 33 per cent. at the 8-foot level, and 30 per cent. at the 6-foot level.

This pollen record shows former distribution of *Castanea* to have been at least one hundred miles westward of the present range limits, and of spruce and fir approximately 800 miles southward of Bacon's swamp, Indiana, the present southernmost profile showing the former range of these genera.

It seems probable that the hypothetical lake in Texas was occasioned by the blocking of a tributary to Yegua Creek. Abundant seep springs now feed the bog with water from under the adjacent hill slope.

The Patschke Bog is located in the Carrizo formation, the lowest member of the Claiborne group, near the middle of the Eocene system. The mineral content consists of about nine tenths medium-grained sands and one tenth sandy clay. Strata of impervious bluish-grey sandy shale occur at intervals, and, where erosion has exposed them, these result in seep lines of generally quite constant function, even during intense drought periods of several years' duration.

The topography is rolling, and the region is covered by a forest of which the dominants are post-oak, blackjack-oak and Buckley's hickory.

The bog itself was originally covered by a dense growth of *Ilex vomitoria* Ait., *Myrica cerifera* L., and *Quercus nigra* L., with *Erianthus saccharoides* Michx., *Panicum* spp., *Andropogon glomeratus* (Walt.) BSP., many species of sedges, *Osmunda cinnamomea* L., *O. regalis* L., *Anchistea virginica* (L.) Presl., *Lycopodium* sp., *Sphagnum subsecundum* Nees., *Rhexia mariana* L., *Pogonia ophioglossoides* (L.) Ker. as representative of the herbaceous flora. *Nyssa sylvatica* Marsh and *Ilex opaca* Ait. reach their southwestern limits along the margins; while the only collection of *Marchantia polymorpha* L. on record for Texas was made from a burned area in the vicinity.

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#### A FORGOTTEN FACTOR IN CARDIAC PHYSIOLOGY

As the result of experience in the devising and use of mechanical hearts,<sup>1</sup> quite naturally my attention has been focused on the mechanical properties of the physiological model. One of these has been utterly impossible to duplicate and, as the efficiency of the machine depends largely on this factor, its consideration becomes of prime interest.

<sup>1</sup> O. S. Gibbs, *Jour. of Pharmacol. and Exp. Therap.*, 35: 197, 1930; *ibid.*, 49: 181, 1933.