echinulate, elliptical, truncated, two-celled structures that ranged in size from 8.4 to 12.0 μ in width, and 14.6 to 24 μ in length (Fig. 2). A few elliptical microconidia 5 by 2 μ were also noted.

The pathogenicity of the isolates was determined as follows. A shaven skin area (10 by 20 mm) on a rabbit was scratched with the point of a needle and a few drops of the fungus in a physiological saline suspension was deposited on the injured area. In 8 days, at the site of the scratched area, a lesion was noticed (27 by 15 mm). This lesion was generally red, with a zone of deeper red at the periphery approximately 4 mm wide. The lesion was rough and covered with light tan-colored flakes. The overall lesion was raised about 1 mm above the surface area of the skin. The fungus was recovered from the lesion 2 weeks later.

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Transferrins in Venezuelan Indians: High Frequency of a Slow-Moving Variant

Abstract. *In 58 percent of the Yupa Indians of Venezuela there is a slow-moving transferrin electrophoretically indistinguishable from Tf D_{Chi}, which to date, has only been found in Chinese. This finding is additional evidence for the existence of a racial link between South American Indians and Chinese.*

The electrophoretic study of the distribution of transferrin phenotypes in the native population of the American continent has demonstrated that the common transferrin C is the only one yet found in the Eskimos and Alaskan Indians (*1, 2*). Among the Navajos of the United States (*3*) and Lacandon of Mexico (*4*), the transferrin B_{0-1} has an incidence of 7 and 17 percent, respectively. In other tribes (Itza, Lenca, Kekchi, Jicaque, Chiapaneca, and Rama of Mexico and Quiche of Guatemala) a slow-moving transferrin in heterozygous form (*2*), which has not been completely identified till now, has been found to have an incidence of 1 to 6 percent. Arends and Gallango (*5*) identified in the Irapa, Paraujano, and Macoita of Venezuela, a slow-moving transferrin that behaved as D_1. Fast-moving transferrins have also been found in the Quiche Indians of Guatemala, in the Tzotzil, Chinanteca, and Zapoteca of Mexico (*4*), and in the Quechua of Peru (*6*).

Transferrin B_{0-1} is apparently a mutation peculiar to Indians that live in the northern part of the American continent (*7*). In some instances, admixture with neighboring populations might explain the existence of aberrant variants (*8*), but this is not the case for other tribes (*5*). Therefore, these differences in populations, that presumably belong to the same racial stock, indicate the importance of furthering the study of transferrins in other native populations of the American continent.

We have studied the occurrence of transferrins in 91 Yupa Indians, 69 of whom belong to the Pariri tribe and 22 to the Shaparu tribe. They inhabit the foothills of the Sierra de Perijá (latitude 9° to 11°N, longitude 72°40′ to 73°30′W) and linguistically are considered Carib. Serum samples were collected from subjects located in dwellings near the Mission of Los Angeles del Tukuku (*9*). Special care was taken not to include serums from related persons, but since these two tribes represent primitive populations on the verge of extinction, endogamy probably plays an important role in gene distribution.

Serum samples were obtained by venous puncture and tested by means of horizontal starch-gel electrophoresis, the technique of Smithies (*10*) being used with minor modifications as described previously (*11*). To identify the transferrins, Fe^{59} in sulfate form was added to the serum in the proportion of 5 μc/ml. Autoradiography was performed on Ansco nonscreen x-ray film according to the method of Giblett *et al.* (*12*). The protein fractions were stained with amido black 10B.

Since the two tribes belong to the same linguistical and ethnological group, and because the difference between the frequencies obtained for each individual group was not statistically significant, the results obtained were pooled (Table 1). The difference in frequencies in the two tribes is 2.11 times the combined standard error, which is significant only at the 5-percent level; the χ^2 computation for the two sets of observations gives a value of 5.71, $p > .01$. That we found a slow-moving transferrin of high frequency was remarkable;

Table 1. Transferrin frequencies in two Yupa Indian tribes.

Tribe	No.	Phenotype			$p^{Tf D_{Chi}}$*	S.E.	χ^2†	P (d.f. = 1)
		C	CD_{Chi}	D_{Chi}				
Pariri	69	0.391	0.391	0.218	0.4135	0.042	2.57	>.10
Shaparu	22	.500	.500		.2500	.065		
Totals	91	.418	.418	.164	.3730	.036	1.06	>.30

* p^{Tf} refers to the observed gene frequency. † χ^2 refers to departure from Hardy-Weinberg equilibrium.

Table 2. Populations with unusual frequency of aberrant transferrins.

Transferrin	Population	Frequency (%)	Reference
B_{0-1}	Navajo Indians (U.S.)	7	Parker and Bearn (*3*)
	Lacandon Indians (Mexico)	17	Sutton *et al.* (*4*)
D_{Chi}	Chinese	6	Parker and Bearn (*13*)
	Yupa Indians (Venezuela)	58	This report
D_1	Aborigines (New Guinea)	18	Barnicot and Kariks (*16*)
	Habe (Nigeria)	15	Barnicot *et al.* (*17*)
	Fulani (Nigeria)	16	Blumberg and Gentile (*18*)
	Aborigines (New Guinea)	19	Bennett *et al.* (*19*)
	Aborigines (Australia)	44	Kirk and Lai (*2*)
D*	Rama Indians (Mexico)	43	Sutton *et al.* (*4*)

* No further subtyping.

since its existence could not be explained on the basis of admixture with Negroid populations, we considered that this transferrin might either be different from those described to date or identical to transferrin D_{Chi}, recently found in Chinese natives of the province of Kwantung in southern China (*13*). It was then demonstrated by Parker (*14*) that the slow-moving transferrin found in the Yupa Indians is, in fact, electrophoretically indistinguishable from transferrin D_{Chi}.

If this finding is confirmed in future studies, it will constitute additional evidence that a racial link exists between Asiatic Mongoloids and South American Indians. Such a relationship was suggested previously by studies of physical anthropology and blood groups, especially of the Rh and Diego blood group systems (*15*).

The high percentage of Yupa Indians (58 percent) in which this slow-moving transferrin has been found places this population among the few with a noticeable frequency of aberrant transferrins (Table 2), and makes it very appropriate for genetical and biochemical studies. Of the possible mechanisms that may explain the high concentration of this transferrin in the Yupa Indians (mutations, selection, genetic drift, and endogamy), endogamy and genetic drift are probably the most important, although plans are being made to test thoroughly the possibility of a local selective agent.

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Cesium in Liriodendron and Other Woody Species: Organic Bonding Sites

Abstract. *In trees labeled with cesium-137, the isotope in the sap streams is primarily in the free ionic form. Much ionic Cs^{137} also appears to occur in intracellular fluids other than the sap streams. However, a small quantity of Cs^{137} forms ionic bonds with organic compounds (probably as salts of carboxylic acids). Even though most of the activity appears in the phloem tissue, some activity is dispersed in much of the sapwood and even in the dead xylem tissue of the heartwood. Some of this Cs^{137} is retained, at least temporarily, by the numerous carboxylic groups of the natural plant compounds of cell walls, cytoplasm of living cells, and cell debris of heartwood.*

Recent studies on mineral cycling in trees have stimulated interest in the possibility that mineral-organic bonding is related to mineral translocation (*1*). A forest on the Atomic Energy Commission Reservation at Oak Ridge National Laboratory has been used for investigating the seasonal cycling of cesium-137 in trees. Because some of the Cs^{137} appeared to be retained by woody tissue instead of being transported freely in the sap stream, the occurrence of organically bound cesium in both the sap stream and woody tissue was investigated. The possible sites at which cesium might become bound with organic compounds, and the degree to which cesium is retained by wood might well influence the rate of movement of the isotope throughout the tree and in whole ecosystems.

Stem sections (ranging from 15 to 20 cm in length and 0.6 to 2 cm in diameter) were removed from tulip poplar trees (*Liriodendron tulipifera* L.) labeled with Cs^{137} by means of a semigirdle around the base of the trunk (*1*). Each section was weighed at the time of collection and placed in geometrically controlled positions in cartons where radioactivity was determined with a scintillation counter (*2*). After counting, the sap was removed from each stem section by vacuum suction as suggested by Bollard (*3*). This was followed by vacuum suction of distilled water through the stems. The sections were weighed again and their activity determined by the same method. Finally, the stem sections were dried in an oven and reweighed.

Between 1 and 10 percent of the fresh weight of the stem sections was removed with the sap, while 10 to 20 percent of the original radioactivity was removed. The percentages of loss of both weight and activity resulting from sap extraction were inversely related to the original weight of the stem sections. These data suggest that the bulk of activity was retained in the woody tissue. Since the sap weight accounted for only about 10 percent of the loss in weight of the total moisture upon oven drying, a relatively high percentage of moisture, not removed with the sap, appears to exist. This moisture could account for much of the Cs^{137} retained by the woody tissue after sap removal.

The sap was concentrated by evaporation at 40°C and used for paper chromatography. Two solvent systems were used [71 percent phenol and butanol-acetic acid (*4*)] on Whatman No. 1 paper. Standard chromatograms also were made with Cs^{137} only. The paper chromatograms were air dried and scanned for locations of activity using a Geiger-Mueller tube.

The R_F values of the radioactive spots determined by paper chromatog-

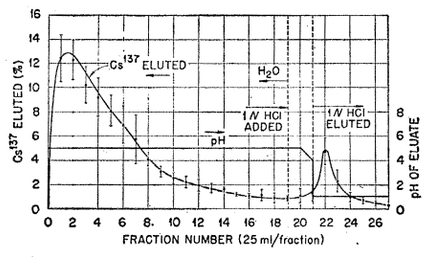

Fig. 1. Elution of Cs^{137} from columns of pulverized wood. (Means ±2 standard errors.)