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THE QUEST OF THE SACRED GINKGO

It was almost ten years ago that I first learned of the existence of the sacred ginkgo, a tree which has long been known as one of the most interesting living species on earth, and which furthermore reaches back into the dim geological past some 150 million years, a record approached, perhaps, by no other specialized form. When the world was dominated by the giant reptiles, and mammals as well as man were undreamed of, the ginkgo flourished over the northern hemisphere in essentially its present form.

It is of interest, too, because of its peculiar, exotic appearance, particularly its leathery, fan-shaped leaves, and to my mind it occupies among trees much the same position as the buffalo among mammals, carrying details of form that suggest the past, and like the buffalo, too, preserved from extinction through the intervention of man. The ginkgo no longer exists in a wild or natural state, centuries ago having been adopted as a sacred tree in the temple gardens of the Orient and through this circumstance handed down to the present.

My attention was called to this amazing tree when as an amateur collector of fossil woods and leaves I came upon the fascinating account of Dr. Merriam[1] concerning the discovery of a fossil ginkgo leaf still enclosed within its mold in the vicinity of Bonneville, Oregon. Sometime later I read of the discovery of the same species in the silt beds of Spokane, Washington. At this time we had begun to collect leaf prints from the Grand Coulee Dam Site locality and fossil petrified woods at Vantage.

Because of the close resemblance of the Grand Coulee leaf types to those of the Spokane area we had forecast that the ginkgo leaf would appear at the former locality and it became the special object of our collecting at the Coulee. For two years our search remained fruitless. We were sure we could not fail to recognize this very characteristic leaf imprint once it had presented itself.

One morning a small party of students[2] and I made an early

1 John C. Merriam, "The Story of a Leaf," *Schibners,* Vol. 81, No. 2, pp. 130-134. (Feb., 1927.)

2 Students and administration of the Washington State Normal School at Ellensburg were all interested and helpful in this work.

start for the Coulee intent upon putting in a long day at the leaf bed. Most of the drive over was accomplished in the dark of early morning. Half asleep we had coffee and breakfast in the open and almost dull to the situation I stepped over to the road cut and picked up the first silt block at hand. It fell into halves and to my amazement something fluttered out and into the wind.

I gazed at the fresh exposure and there lay the perfect fan-shaped print of the ginkgo leaf. I had never seen the living leaf or its fossil form, illustrations of the leaf prints only, but there was no element of doubt, we were in possession of a ginkgo leaf print, and, behold, there adhered in place small fragments of the original leaf. After a lapse of a dozen million years or more the original leaf had once more responded to the winds of the earth. Needless to say we were thrilled as only explorers and collectors can be thrilled on occasion. This particular specimen is the most prized in my collections. Part of the fragments I saved have been shellacked in place upon the print and one small piece has been placed upon a slide for microscopic study of its cellular structure. Subsequently we have encountered about a dozen ginkgo leaves from this locality.

About three years ago we determined to put out wood collecting upon a scientific basis, to gather materials systematically and pay due attention to the various forests and horizons we had under examination. To identify the types of wood it became necessary to study them in detail under the microscope which required that we grind sections thin enough to be translucent to light. Under this routine it soon became apparent that instead of the half dozen or so trees we had anticipated, some scores of varieties of wood were involved. Furthermore we soon became conscious of the fact that we were dealing with an assemblage similar to the leaf bed at Grand Coulee. Birches, oaks, walnuts, maples, sycamores, red gums, etc., were common to both and why not the ginkgo.

To my knowledge no one had up to this moment encountered a fossil log which could without question be assigned to the genus ginkgo, although as above mentioned, it had long been accorded a world wide distribution in the northern hemisphere, through the evidence of its fossil leaves.

I was driving along the highway near Vantage one day when I saw a stranger come down from the bluff with a section of a petrified log, and I said to myself here would be the scene of our next field work. Accordingly within a week we had located the first logs

in the Ginkgo Petrified Forest and had established that a certain lava flow contained hundreds, if not thousands, of logs.

In this manner began the work in the area where now lie the trails and exhumed logs of the preserve. In our work about a quarter of a mile could be covered in a day. Following the exposure along the coulee slope from three to five of us moved along with pails and hammers, sampling pieces from the fragment "slides" that spread out fan-shaped down the slope from the point of source, and breaking small fragments from the occasional log butts projecting from the surface.

It was probably from the third day's collecting that we encountered the first trace of ginkgo wood. We had failed to recognize any log or fragments as such in the field. I had studied all the larger numbered pieces under the binoculars and was on the point of throwing out a dozen small fragments that had been gathered at random. It occurred to me that no scientist would be guilty of discarding any such additional evidence and to my delight the first of these small pieces I took up presented detail of structure that made it eligible for consideration as a ginkgo. There was no time for food or sleep until the thin sections had been ground down. Feverishly I went to work.

There was hardly enough material at hand for the three sections required. The replacement was to soft opal so that in two hours I had before me a faithful reproduction in stone of the minute anatomy of this remarkable tree. I was satisfied at once that it was a ginkgo, the wood is almost as unmistakable microscopically as is the leaf to the naked eye. May I add that these sections have stood the test of examination of others much more competent to judge than I. Here was a trace—clue—to the world's first fossil ginkgo log.

Were we to go back over the ground of this day's work and hope to locate the exact spot from which this random fragment came? We elected to go on, to follow along the lava flow with greater caution and determined to recognize the next ginkgo exposure that we encountered. For several weeks we followed the horizon, through a distance of about three miles, in the meantime having come into possession of several more small random fragments and to our chagrin unable to point out the exact location of any of them.

It now occurred to us that if and when we did find a ginkgo log something would have to be done about it. It would be folly to leave

the log to furnish material for someone's rock garden or fireplace. I wrote to an eastern museum and asked if in exchange for past favors they would like to have a section of this tremendously interesting log we were on the point of locating. The answer was affirmative.

For more than a year we pushed out our lines of exploration until we had charted miles of this single forest exposure and listed types that numbered individuals up into the hundreds. But what had become of the ginkgo? Not another fragment had turned up, and so after about 18 months of intensive study of the area I came to the conclusion that the fragments we had first encountered were in fact glacial in origin, that they had been carried in with glacial debris that occurs at these levels in the Columbia gorge. Accordingly I wrote back to the museum stating our disappointment and asking them to forget our offer of the past.

Knowing many of the varieties within this great forest by form if not by name we gave up all thought of the ginkgo and confined our attention to the occasional new types that appeared. One day in the fall of 1932 we were working and mapping southward into Rye Grass Mountain when one of our collecting pails yielded three beautiful matchblock size pieces of ginkgo all numbered identically. Undoubtedly we had encountered a slide or log of the species. This particular locality for the day's collecting had been a coulee one-half mile long and the fifty slides and logs had become confused in our memory. Our chart showed 37-26 to be half way up the coulee.

To take advantage of the freshness of memory we went back the day following carrying picks and shovels and material to carry the log out upon. We walked almost directly to the spot where similar specimens formed a well defined slide from a point half way up the coulee slope to the very bottom. Running up both margins of the slide we located the apex of the triangle and began to dig for the log. Six inches of soil, only, lay on the solid rock so that in an hour we had explored a considerable area. The log must have been completely used up in furnishing the material of the slide.

Before giving up we decided to locate the apex anew. Upon sighting up the east boundary it became apparent that we had failed to estimate the breadth of the slide by several yards. Accordingly the apex of the triangle lay eastward and higher up than our first location. Literally the first stroke of the pick encountered the log.

Rapid work established that we had a firm 16-inch log running directly back into the solid rock. We could penetrate the lava but a few feet and as no transverse cracks cut the log into sections we were unable to remove any portion of it. Reluctantly as evening approached we left our find behind hoping against hope that our digging operations would not expose the log to someone in search of this sort of material.

Before morning of the next day I had determined that as far as I was concerned this log would never be moved from its natural setting. I would ask the public to set aside this remarkable forest and preserve it in its present condition. Upon failure of such a move we could still transfer some of the more interesting logs to a local museum. Failing in that I could carry out my original intention to send a few special pieces East. But half of the interest and benefit in these specimens would have been lost once they were moved a foot from their location as handed down to us through the millions of years.

Public response was immediate and decisive. The logs should be kept untouched. The matter was laid before the State Park Board and their complete cooperation assured. Later in the fall of 1933 came a note from Secretary of State E. N. Hutchinson suggesting that we get in line for the new Federal relief funds soon to be at hand. Accordingly several thousand dollars were awarded to our project by means of which four miles of trail were built and 120 logs partially exhumed.

I must not fail to mention at this point the very fine spirit of cooperation upon the part of the Smithson Sheep Company—in control of the range in which the preserve is located, and private owners of some of the more important sections carrying logs. Both Mr. Smithson and Mr. Holt have been more than generous in their cooperation first allowing us free access to the area for preliminary work, secondly permitting us to do developmental work upon a section belonging directly to them and, lastly, helping us to have the new highway rerouted so as to save some of the finer logs from destruction.

At present about eight sections, including the famous "Indian Painting" at Vantage[3] have been created as a preserve and through the various subdivisions of the National Planning Board a petition

3 It is desired that the beautiful cove where these Indian paintings are found be named the Herbert Fish Cove in honor of the late Professor Herbert C. Fish who helped from the beginning of this work and who was devoted to Indian studies through his whole life.

has been carried to President Roosevelt to set aside the area as a national monument.

The state government will be asked in its forthcoming legislative session to establish funds for the operation of the preserve until such a time as the Federal government may act. The State Park Board has assigned a naturalist-supervisor to the area and the logs are under constant supervision. Between 10- and 20-thousand visitors have stopped off at the Forest this year. The State University has made funds available to continue a study of the very interesting tree types found in this forest.

To return to our quest of the ginkgo. The first log we encountered lies three miles from the highway. The work under C.W.A. auspices had revealed many fine logs of various types and finally to our satisfaction a log of the ginkgo appeared along the site of one of the trails. About a dozen ginkgo logs have been encountered at various greater distances from the highway. Since log number 22 on the trail adjacent to the highway is inferior in form, having been badly shattered, presumably by frost action, we have had in mind the removal of a good specimen from some distant point to the museum we hope to put up in the Forest and on the highway. Fortunately last spring a fine sample of ginkgo was brought in from one of the outlying areas impossible to protect from the public. Numerous logs had been removed and this ginkgo log was next in line. One of our public spirited Ellensburg citizens volunteered to have the log exhumed and removed to a place of safety until such a time as our museum becomes an accomplished fact. It is a beautiful opalized specimen 6 feet long by 16 inches in diameter.

As to the origin of the name Ginkgo Petrified Forest, it was chosen from among three titles that I suggested to Superintendent O. A. Tomlinson of Rainier National Park who was one of our first public guests and staunchest supporters.

The wood of the ginkgo and the leaves may appear again anywhere in the Columbia Plateau. We have found the leaves to be plentiful in the Taneum, near Ellensburg, and lately prints have come to my attention from Republic.

This story would not be complete without an account of my introduction to the living ginkgo. I had not as yet seen a living tree, though quite familiar with the fossil forms. I was crossing the campus at the University of California cutting across the lawn and thinking of the fossils I had brought with me rather than the

present. Suddenly it seemed that time had been reversed upon me 20 million years. There on the grass lay scattered a group of these exotic odd-shaped leaves, and stranger still they were still clinging in numbers overhead to the twigs of a living tree. To help carry out the illusion a conifer of the sequoia type stood at its side. This was the greatest thrill of all in this most romantic search for the world's most interesting tree.

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