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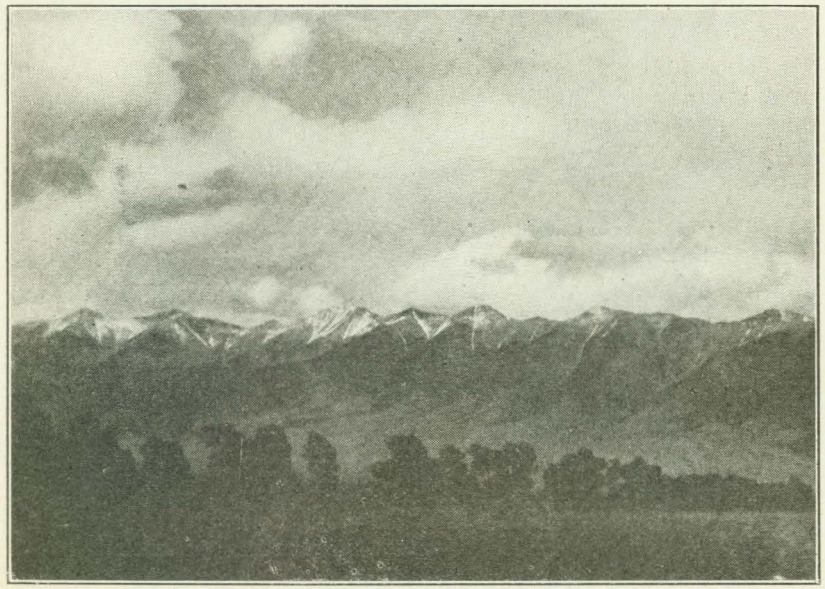
Colorado's Desert of Shifting Sand

By Frank C. Spencer, Olivet, Michigan

Miles from the main thoroughfare of travel and the routes frequented by the throngs of tourists, yet plainly in view from the broad stretches of wonderfully fertile San Luis in Colorado with its many prosperous homes, lies a marvelous desert of shifting sands.

Clearly silhouetted against the western slopes of the rugged Sangre de Cristo range of mountains, these glistening hills of sand appear so near that the unwary traveller is tempted to reach them by an afternoon stroll, but the miles and miles of intervening sand plain and dunes make the approach to them from this direction really quite difficult. The venture, however, is well worth much more than the trouble it costs.



The Rugged Sangre de Cristo Range

In some respects, they are more remarkable than the great deserts of Sahara or Gobi, for this desert seems so unnatural and out of place in the midst of this fertile region. How came these great mountains of almost pure white sand in this region, what were their origins, are questions that have puzzled the traveller and scientist alike.

The desert proper covers an area of nearly eighty square miles, and it is bordered on the south and west by a region of sand plain and dunes of even greater extent. Seen from a distance, the desert has the appearance of a low lying range of hills of greyish white, outlined sharply against the green forested slopes of the mountain range. It is sometimes mistaken for a bank of snow or clouds when seen in an uncertain light.

As one approaches them, they rise in their grandeur and at their bases seem, as they are, veritable mountains, peaks, and ridges, shining and glistening in shroud-like whiteness.

That so little is known of them seems remarkable when one remembers that they were first seen by white men three and a quarter centuries ago, when Juan de Zaldivar led his band of explorers, in 1599, up the Rio Grande river and over the Sangre de Cristo mountains into the Great Plains from the second oldest settlement in the United States.

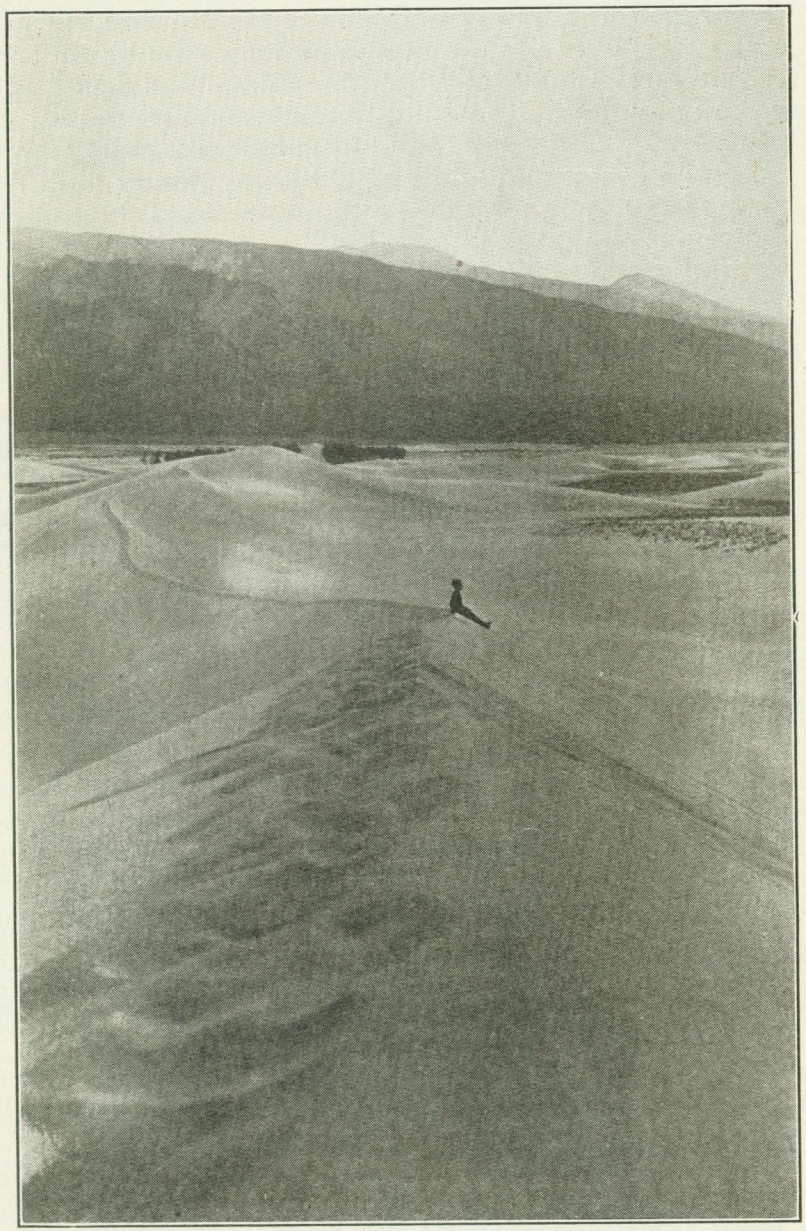
Lieut. Zebulon Pike was struck by their vastness and wonderful beauty as he viewed them from the top of the Sangre de Cristo mountain pass, in that truly remarkable journey of exploration in 1807, in which he took possession of the country and raised the first American flag in the Rocky Mountain region.

Fremont and Capt. Gunnison, too, were greatly impressed with their unique and striking appearance as they passed them in their trans-continental explorations in the forties and fifties.

When the railroads were built into the San Luis valley in the early seventies, they were constructed over passes some distance from this sandy desert. Thus left far from the iron highways, interest in them began to wane. The ordinary tourist does not relish the long arduous climb that has been necessary to reach them on horseback or by slow plodding team; however, at the present time one may reach a point about two miles from their margin by auto.

To the real lover of nature in her more wonderful moods, which can only be found in these out-of-the-way places, these difficulties but add zest to the adventure.

The first time the writer was privileged to explore this desert region was about ten years ago when an "oil boom" led to the staking of all the adjoining territory as well as a part of this desert of shifting sands. What a remarkable though dangerous



Tracks Which May Be Seen for a Mile

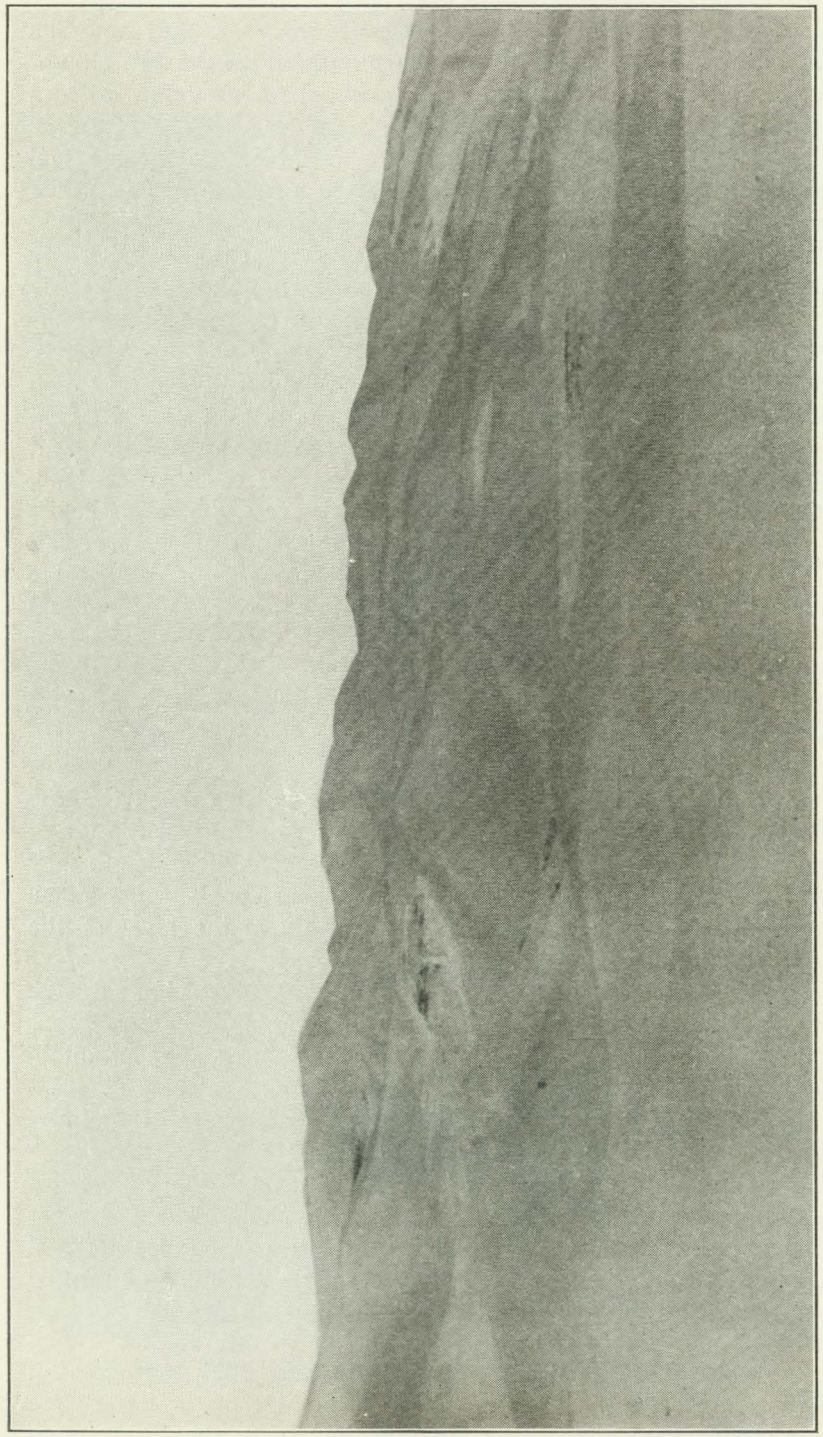
experience it was! It seemed that one was transferred to a new and unreal world. The shimmering glare of the summer sun, reflected from the almost pure white sand, gave everything a waving, trembling, ghost-like appearance that is unlike anything experienced before. In this glimmering atmosphere we ran lines and set stakes which were doomed to sudden disappearance with the first wind storm. Even as we labored through the treacherous footing, ankle deep, leaving broad footprints which could be seen for nearly a mile, the slight breeze that was blowing lifted the light particles into a thin white cloud from the crests of the ridges and soon blotted out these footprints.

The danger consists in the fact that this breeze may, without warning, be transformed into a gale which so fills the air with flying grains of sand that darkness falls suddenly and objects are seen only in dim shadowy outline which is very bewildering. All sense of direction is soon lost and the traveller finds himself groping in deadly circles. Should this gale continue, the whole configuration is soon so changed that his bewilderment is complete. Woe betide the traveller who encounters such a storm!

The writer well remembers the dire consequences of delaying his departure too long after the beginning of such a storm in order to complete the marking of a line. No attempt was made to find our way out, but the flying sand, filling eyes, ears, and nostrils, almost suffocated us, and so inflamed became the delicate membranes of our eyes from the beating of the sharp grains of sand that blindness nearly resulted.

The Mexicans of the region have a legend that years ago a herder with his entire band of sheep was caught during an unusually severe storm in the midst of this desert region and completely covered by the treacherous sands. Such might easily have been the case, for it often happens that after a prolonged windstorm the topography of the desert is completely changed. Hills are changed to valleys; where a marked depression was found before the storm might be the site of a prominent peak. Truly it is an unreliable land.

About fifteen years before the writer's experience another surveyor was engaged to do some line work in this desert. A sudden storm overtaking him, he and his men were compelled to leave the place with such precipitancy that their instruments were left behind. When the storm subsided, no trace of these surveying instruments could be found. Ten years later some ranchmen traveling the region found the metal parts of the transit and a compass intact. The wooden parts were gone. Little remained of the surveyor's chain except a streak of rust.



They Appear so Near That the Weary Traveller is Tempted to Reach Them in an Afternoon Stroll.

While the dangers of the desert are real, they may be avoided or greatly lessened by a sharp lookout for the dust clouds, which may be seen far to the westward across the valley when a storm is approaching.

Then, danger only lends zest to an adventure for the real explorer. Without it the world would be an inane place.

Our curiosity is naturally aroused as to the causes which led to the building up of these mountains of sand at the foot of these timber-clad ranges whose peaks of granite are covered with snow nearly the entire year. Surely no erosion from them has furnished the material for these miles of drifting sands; for, counting in eons, the Sangre de Cristo range is comparatively recent in origin and its sharply outlined peaks show little signs of erosion.

The most plausible explanation seems to be that the great inland plateau called the San Luis valley was once a vast lake. Then, due to gradual tilting of the earth's crust, the water began to overflow the ridge to southward. Thousands of years of this flow has caused a great chasm to be cut through this basalt ridge through which the Rio Grande river now flows. The gradual drying of the lake left a broad sandy waste over which winds of a thousand years have been blowing. The sweep of these winds, generally from the southwest, has carried these sands yard after yard and mile after mile until they have reached this recess of the mountain range.

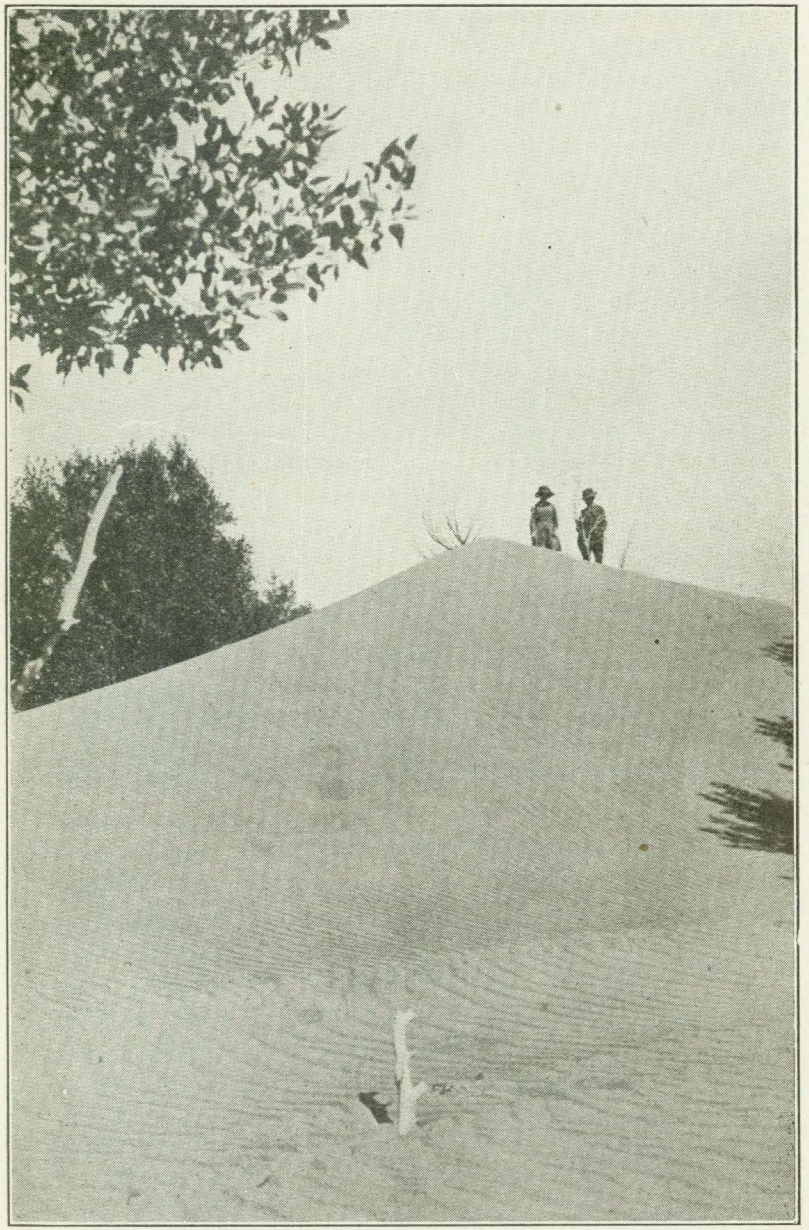
Sometimes it was the gentle breezes which carried the fine particles along—at other times the fiercer gales hurled the larger pebbles forward until all reached this final destination, where they have been piled in great white ridges and sharp peaks which reach an elevation of almost a thousand feet above the level of the valley.

The stronger winds have lifted the finer dust high into the air and carried it over the high mountain ranges, where it has built up a soil of wonderful fertility in the famous Wet Mountain valley.

Thus it is that these hills are of pure sand with little admixture of dust or humus.

The rapid heating and cooling of the layers of air above this glistening waste produces many remarkable phenomena. Mirages and looms are common. To the westward a few miles are real lakes which may be seen from the higher ridges, but, so confused are these with the illusions of beautiful lakes surrounded by trees, that the eye cannot distinguish the real from the fancied.

Sometimes the stunted cedars, making their unsuccessful fight against the encroaching sands at the edge of the desert, are seen growing so unnaturally tall that they seem ghostly. Some-



In Many Places Only the Tops of the Trees May Be Seen

times these illusory scenes are painted against the clouds and at others upon the mountain side. Then again, they may be seen suspended in the air.

Adding to the ghostly atmosphere of the place are the strange moanings of the shifting sands when disturbed by any unusual vibration. Naturally the long ridges blown up by the gentler winds have slopes as steep as the dry sands can possibly hold, and the tops of these ridges are as sharp as the apex of an "A" roofed building. When one is walking along the tops of these ridges, he is forced to have one foot on each side of the apex in order to preserve his equilibrium.

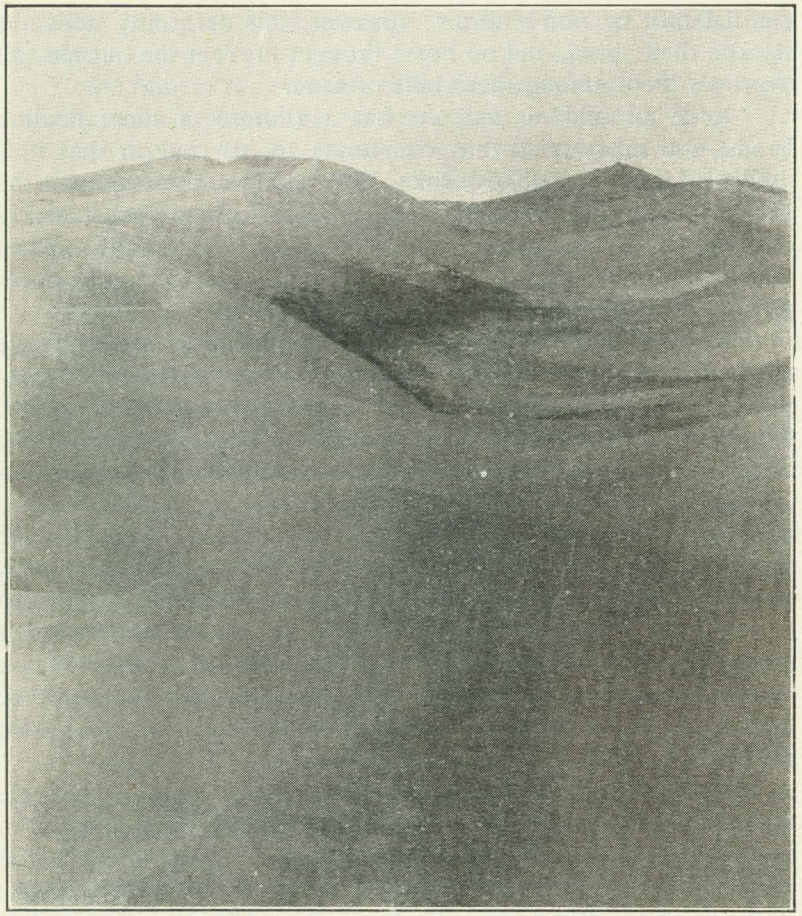
A curious fact is that on the windward side of the ridge the sand is found to be so closely packed and hard that it is possible to walk upon the surface as upon a crusted snowdrift. On the leeward side it is quite different. Here we found ourselves sinking into the soft, soft sand, half way to our knees. Strangest of all to us was the fact that in walking about in this loose sand the disturbance would sometimes cause the whole side of the ridge to start sliding downward, producing a weird moaning or shrieking sound that it is impossible to describe, yet it cannot be mistaken for any other sound. For this reason it is sometimes called "the land of moaning sands."

When strong gales hurl even the heavier particles through the air, a hissing or whistling sound is heard which reminds one of the whistling of bullets on the battlefield. These weird sounds tend to increase the feeling of unreality which pervades the region.

In some places the winds have literally scooped great depressions between the ridges, whose bottoms are marshy, and where a scant vegetation may be found growing. There is a coarse grass with long fibrous roots, together with some rapidly growing flowering plants. On even the dry ridges, plants are found with long string-like roots which run along the ground for as much as twenty feet, sending down rootlets every few inches along the way. When the wind has blown the sand from these roots, as it often does, the ridges appear to be covered by giant spider webs.

On the border of the desert, junipers and scrub pinons are making a gallant but losing fight against these ever-shifting sands. In many places only the tops of trees may be seen above the ridges. A little while longer and the struggle will be over. The relentless sands will have swallowed up its victims for aye. Such are the grim tragedies of Nature in this desert land.

Like the plants, the animals of the region are few. Long lines of parallel tracks show that a shrew mouse or rat finds a precarious living on the roots of the spidery plants. Within a few hundred yards of the margin of the desert tracks of foxes,



In Some Places the Winds Have Literally Scored Great Depressions Between the Ridges

coyotes and sometimes a solitary skunk are seen. It is probable that these are but occasional visitors to this starved region.

It has been known for years that bands of mustangs have made these hills their rendezvous, and, in this connection, a remarkable thing has occurred. I believe it is not generally known that the shape of a horse's hoofs, as we see them, is preserved by the constant wearing action of the ground over which he travels, and it is the grinding of rocks and gravel which keeps his hoofs short, rounded, and smooth on the under surface. Now, since the hoofs of the horses which frequent these hills sink deep into the soft sand, they are subjected to no such wearing action. Consequently, their hoofs have continued to grow longer, to spread and turn outward or inward until they have a most grotesque and deformed appearance—somewhat like that of a

gnarled root or ram's horn. However, this deformity does not slacken their speed, and no horse brought in from the outside can overtake them among these hills of sand.

It is but seldom that one has a glimpse of these fleeting bands, and many a cowboy has found to his chagrin that it is useless to try to overtake them. They soon outdistance even the fleetest horses and are out of sight in a surprisingly short period of time. It is not probable that their speed is actually greater than that of the ordinary horse, but their wide spreading hoofs give them a great advantage in the soft sand.

One of the mountain passes, the Medano, leads directly down toward the Sand Hills, and, in this pass, a stream of considerable size rises which flows out against the base of these hills. During the greater part of the year its waters sink beneath the great masses of sand, but, during the spring floods, a wide but shallow river flows around the southern margin. It is not a continuous stream, but a succession of lakes and bars. It is a strange sight to see the waters fill in behind one of these great bars which suddenly gives way, allowing a flood to sweep down to the next barrier; this is repeated over and over. In some stretches of the stream, it has the appearance of a river of flowing sand, but woe to the misguided animal which lingers in its bed, for here the dread quicksands lie in wait to ingulf it, like the tiger in wait for his prey.

It has been stated that during the greater part of the year the waters seem to disappear completely below the mountains of sand, but, a few miles to the southwest, a great spring bursts forth from the midst of a sandy plain, from which it has cut a deep channel to the meadows below. One riding across this plain has no hint of the presence of the spring until he is almost upon it. Then he looks down into a deep chasm from the end of which a stream boils out. It is truly a remarkable sight, and was held in great veneration by the Indians who formerly frequented this region. It was a common and neutral camping ground for various tribes, for here they could lie in wait for the deer and antelope to come to the spring to drink, where they were an easy prey.

Many "molinos," or hand mills, are found scattered about the place, as well as spear and arrow heads and a great variety of potsherds, which indicates that it was used for many an Autumnal hunt. Every wind storm uncovers many additional treasures, so that it is a favorite hunting ground of the antiquarian who dares to brave the desert sands.

Gradually the shifting desert sands are encroaching upon the timbered western slopes of the magnificent Sangre de Cristo range of mountains; aspens, junipers, pinons and pines are being

gradually, but none the less surely, smothered under their pitiless advance.

Some time in the eons to come, these mountains of sand will probably form a part of the western slope of the lofty Sangre de Cristo range, but, for many years, they will form the wonder of the scientist and traveller. One involuntarily searches among the long ridges of shimmering sand for the Arab caravan which was the invariable accompaniment of the desert scenes with which we are familiar.

Sometimes, seen from the valley below, in the early rays of the rising sun, they are bathed in a beautiful crimson glow; sometimes, when the clouds are flitting in the sky overhead, they change in color and outline with each vanishing shadow. Seen in the moonlight, each peak and ridge stands out in wonderful contrast and clear profile compared with the deep shadows of the valleys and ravines. Seen in the winter, they lie cold and marble-like in their mantle of glistening snow. But, to see them in their most wonderful aspect and beauty, one must ascend the mountain pass to the eastward and view them in all the glowing colors of the setting sun.

Viewed in any light and at any time this Colorado Desert of shifting sands presents a most interesting and wonderful panorama.

Early Colorado Days

Interview with Thomas T. Cornforth by Albert B. Sanford, Denver, Colorado, May 20, 1924

To have been actively identified with the early wagon transportation of freight across the plains into the Rocky Mountains, when oxen were the motive power, and constant guard against Indians was necessary to protect life and property; to have kept in advance of the construction of the Union Pacific railroad with a chain of supply stores; to have witnessed the driving of the gold spike at Promontory Point which connected the rails from the Atlantic to the Pacific, is but a part of the story told of the West by Mr. Thomas T. Cornforth, still living in Denver.

He was of English birth and came to the United States at the age of fifteen. With two brothers, he reached Kansas about the close of the border troubles in 1859 and located fifteen miles above Leavenworth. Here the brothers put up a building and opened a general store, continuing in business until May, 1862, when they bought a string of wagons and oxen, loaded a large

supply of merchandise and started for Denver, where they arrived in June. They secured a location in Blake Street between F and G (now 15th and 16th) and continued their freighting business from Missouri River points, and, in addition to hauling the usual merchandise for trade, were engaged in government transportation to Ft. Morgan and other points.

Of the great flood in Cherry Creek in '64, Mr. Cornforth says: "Our outfit was in camp about three miles up the creek, but fortunately not in the very low land, although the water was hub deep before we could get oxen together and pull out on higher ground. We reached town about 9:00 in the morning and found practically the whole place under water. People were busy in efforts to recover property and rescue families marooned between the creek and the river. Boats were hastily constructed of any available material and were the means of saving many lives and valuable personal property. In those days the creek headed in a forest of yellow pine along the Divide. This timber extended easterly to the plains and was seven miles through as we traveled south. Some four to five feet of snow lay in this region from the winter storms. Then came a heavy rain period for two days or more and the deluge was the result. No 'cloud burst,' only an unusual condition, not only on the upper reaches of Cherry Creek, but on the entire Platte water shed. I am clear on these matters as I had wintered oxen on Jimmy Camp Creek on the south side of the Divide."

The Cornforth Brothers were burned out in the "big fire." Mr. Tom Cornforth was out on a trip, but returned soon and rebuilt the store. About the first structure to be rebuilt was the Elephant Corrall, between Blake and Wazee streets, then Walter Cheesman's place, near the corner of Fifteenth and Blake streets, followed by the Fillmore Block, on the southwest corner of Fifteenth and Blake streets. The demand for brick started new yards near town, and many old cabins wrecked by the flood were used as fuel in the kilns.

On one freighting trip, in '63, Mr. Cornforth hauled the first steam boiler to Rollinsville from the Missouri River. He had only a trail to follow up Left Hand Creek from the valley, but made the entire trip in forty-two days. This was for General John Q. A. Rollins' stamp mill.

Another shipment of fire brick was hauled from the Missouri River, where it had come by boat from Quincy, Illinois, to Nebraska City. This was for a desulphurizing plant at Black Hawk and was billed as "time freight" and included a lot of steel and powder. The freight alone on each fire brick, weighing eight to ten pounds, was $1.00.

During the summer and fall of '63 the Indians were preparing for the outbreak which came in '64. "We always went prepared for trouble by having a good supply of the best weapons then available and, although the Indians attacked us many times, we were never overpowered and they soon learned that our trains were not safe for them to tackle.

"In April, 1865, freight and passenger traffic from Denver to the Missouri River was practically tied up. The Indians had murdered many travelers, burned stage stations, run off stock, and destroyed wagon trains. I wanted to get east at that time, and chancing to meet Mr. Charles Dahler, the agent for Wells-Fargo Express Co., we talked of the situation. He said one of his trusted drivers, Yank Coad, was ready to take a coach through to Atchison provided he could get two good men to go with him. I found another man who was anxious to go, Captain Smith at Camp Weld, so it was arranged that we would leave next morning at 7:00 o'clock.

"At that time Kountz Bros. and the First National Bank had a large amount of gold dust and western exchange which had accumulated and it was highly important that this be forwarded to their eastern correspondents. The Stage Company had refused to accept it, so, when Charles and Luther Kountz heard I was going, they asked me to take it along for them. I agreed, with the understanding that it was at their own risk. This was settled and they put the gold and exchange in three old Gladstone bags re-enforced inside with strap iron to carry the weight.

"George Wells and Harry Rogers of the First National Bank brought about the same amount, which I took subject to the same conditions. Both shipments, amounting to about $150,000.00, were placed in the front end of the coach where express matter was usually carried. We finally got away about 8:00 o'clock in the morning. We drove all day, reaching Living Springs about 8:00 o'clock, and found the station deserted. We fed and rested the horses, then drove on and arrived at the station about two miles northwest of present Ft. Morgan. This was kept by Charles Emery, who reported that the Indians had been very numerous in that neighborhood for thirty days. Here we rested for two or three hours, got six fresh horses, and, after driving all night, reached Valley Station, kept by Moore Bros., before we succeeded in getting another change of horses. We left very shortly and drove to Spring Hill Station, thirty-six miles from Julesburg.

"Here Ed Lewis was in charge and urged us not to go further, for the Indians had burned the Hackley ranch, twelve miles ahead, destroyed a wagon train, and torn down the telegraph line for two miles. However, we concluded to take the chance and

in the afternoon pulled out and had no trouble in reaching Ft. Sedgwick. Taking a few hours rest we continued with two additions to our passenger list, Mr. Majors of Majors, Russell and Waddell, and his son, now living in California.

"We drove forty miles without change of horses to Midway Station and succeeded in getting another change. We then proceeded to Cottonwood, about fifty miles distant, where we found about 100 U. S. cavalry soldiers camped. They, too, advised strongly against our continued journey, telling of a number of Indian killings a short way eastward. Again we put out and reached Pat Malley's ranch, where we changed horses, and from there made Fort Kearney without special incident. Here I delivered the Kountz gold and exchange to the Express Company to be forwarded to the Omaha bank, owned by Kountz Bros.

"At Fort Kearney we met Ben Holliday, owner of the stage line, who was greatly pleased to see us. He had waited there for ten days for an eastbound coach. We advised him to await the next coach from the west, as there was serious question as to our getting through. We stayed here twelve hours, taking a very much needed rest.

"Next morning, with an early start, we left the Platte River to go to the Blue. At Elm Creek, thirty-six miles east of Kearney, we found the bodies of eight men, slain by Indians and lying in the road. A threshing machine lay on its side, the wagons pillaged and partly burned. All the stock stampeded, carrying harness and wagon tongues. We remained here only fifteen or twenty minutes, then pushed on to the next station, Liberty Farm, on the Little Blue River, in charge of George Breckenridge, to whom we reported what had occurred at Elm Creek.

"Here we learned that a band of some two hundred Sioux had burned several stations on the Blue eastward and had done a good deal of killing. Notwithstanding this we kept going, for we were abundantly prepared for trouble. We had plenty of guns and ammunition, but it was a dreary ride.

"As we approached Burr Oak we found the station burned and ran into a band of ten Indians a little distance ahead. Yank Coad, the driver, dropped into the boot in front with lines in hand. We commenced shooting over his head and scattered the Indians, but it was a running fight to Slaughter's Station at the foot of Eighteen Mile Ridge on the Little Blue.

"Here we lay by until morning, but had no further trouble, although a raid had been made on the Big Sandy on the east side of The Ridge. Then we went to Marysville on the Big Blue, next to Senaca, forty miles east. Another sixty miles brought us to Atchison, Kansas, landing there pretty well worn out in

body and soul. After turning over the First National gold, we went to the Massosiat House, kept by Tom Murphy. Our trip with its attendant trials and danger was the occasion of a very warm reception given us by the citizens.

"In June, 1867, we sold our freighting outfit to Wells Fargo at Salina, Kansas, then the end of the Kansas Pacific Railroad. We had a contract with the government to haul freight to Ft. Wallace, 180 miles east of Denver."

They loaded for Ft. Wallace, unloaded there, then went empty north to Ft. Sedgwick at Julesburg, then loaded for Ft. Phil Kearney on the Powder River in Wyoming. En route, the whole train was captured by Indians and some six or eight men killed.

After selling out, he came to Denver. "Cheyenne was just starting, the graders were working on Sherman Hill, and chances for business there looked good. I got a man, Neil Howey by name, and started from Denver with five wagons of four mule teams. We went by the present site of Longmont, thence north to Lone Tree Creek, where men were putting up hay for the graders. They put us on the night course for Cheyenne, where we arrived in good time.

"There were no more than twenty or twenty-five men there, living in tents and shacks. I ran into two friends, J. W. Kuykendall and J. L. Whitehead. We talked over the situation and agreed a town would be located here. Our goods were unloaded by the road and on the ground, protected as best we could. I immediately sent word to my brother Birks, in Denver, to send me 100,000 feet of lumber and all kinds of merchandise and materials he could pick up at a bargain. On August 10 this stuff left Denver, and I put up the first frame building in Cheyenne, with the end of the railroad at that time nearly two hundred miles east. The construction gang reached Cheyenne about the last of November, 1867.

"The following spring I started a chain of stores along the Union Pacific to Promontory Point, where I saw Oliver Ames drive the last spike, made of solid gold, that completed the gap between the Central Pacific and the Union Pacific railroads. I had stores at Rock Springs, Green River, Bryan, Wasatch, and Echo City, with one at Corrine, Utah.

"With the exception of the Bryan store, I sold out in '69. From this place I did a forwarding business to points in Wyoming and, during this time, became interested in 'The Miners Delight,' the first big mine in Wyoming."

His faith in the property was shown by his willingness to take an interest in the mine as pay for freighting in the first machinery.

In '72 he sold out his entire northern interests and returned to Denver, only to open up a store in Georgetown a little later, where he continued in mercantile and mining business until '76, when he disposed of holdings and visited the Centennial Exposition. On returning, the Black Hills excitement was commencing. He had left a freighting outfit at Georgetown. Hastily bringing this to Denver he loaded with supplies, went to Deadwood, and opened a store there.

In addition to making locations of mining claims and working some of them, he was always ready to engage in any mining venture that looked good, either alone or with reliable associates.

Then the great Homestake lode was talked of everywhere. Hearst & Haggin of California sent out L. D. Kellog as their representative in the Black Hills. Cornforth had hauled ore from this wonderful deposit to an arrasta on Whitewood Creek, four miles away, and knew its value, and was confident of the means of recovery. Kellog naturally conferred with him on the property and milling problems. Conforth strongly urged the Homestake as an investment and was "go between" in securing sixty-day options on twelve claims covering the reef or deposit which has since that day paid over $45,000,000.00 in dividends.

The preliminary examination of the ore was by panning, that is, by washing a known portion free from gangue and recovering the gold. This method may not have been up-to-date from a strictly scientific view point, but it was altogether practical and proved Cornforth's ideas of milling.

Kellog returned to California, but, before expiration of the option, returned with $120,000.00 and secured an extension. Then, in the spring of '78, George Hearst brought out a number of the best experts of the time, among them Janin Crawford, Farish, and Walter Jenny of the U. S. Geological Survey. After careful examination by this battery of noted scientists, they agreed the ore was of too low a grade to pay. But Hearst was a practical miner and, in face of their conclusions and after listening to arguments of Cornforth and Kellog, based on the proposition that the ore had really shown a profit in small mills and even arrastas, he and Haggin bought the property at Lead, S. D., known to the world as the Homestake.

One Sam McMasters had been with Hearst in California and was at once appointed his general manager, and was instructed to put in a 100 to 125-stamp mill. McMasters rather hesitated, saying that if it proved a failure, his previous good reputation would suffer. Hearst replied: "I've made you what you are. Now go ahead, for I'll have to keep you anyway."

Of Tom Walsh, who owned Colorado's great Camp Bird mine at Ouray, he says: "I knew Tom very well when he lived at Deadwood. He made his first 'stake' in Strawberry Gulch, six miles east of Deadwood, receiving $50,000.00 in cash, and pulled out for Leadville, where he bought The Grand Hotel on Chestnut Street in '79 and 'kept tavern' for a time."

Of one of the men whose early experiences were staged in Gilpin County and who in other years were known the world over, George M. Pullman, he relates:

"I knew Pullman and his partner, Andrew Westlake, at Central in '63. Both were carpenters and good mechanics, but Westlake was of an inventive mind. I can say positively that Westlake was the inventor of the sleeping car berth. He built the original model in Central City. Pullman took this, with another invention, an independent axle, to Chicago and sold an interest for enough to complete patents and organize a company, but could do nothing with the axle. In later years Westlake asked me if anything could be done with this and I took it to Mr. Semple, then master mechanic of the D. & R. G., who recognized its merit and had it patented during Cleveland's first administration.

"To Andrew Westlake, and not to Pullman, belongs the credit of the Pullman car. Westlake never realized any material amount of money, although Pullman gave him small sums at different times. Those who knew Westlake best said he was an easy going and trustful man and altogether unsuspicious in nature. He met death by accident near the town of Arvada in '84. A horse he was driving to a light rig became frightened and ran away, the cart upset, throwing him into an irrigation ditch in a way that resulted in drowning, due to his being stunned from the fall."

Further Archaeological Research in the Northeastern San Juan Basin of Colorado, During the Summer of 1922

BY J. A. JEANCON AND FRANK H. H. ROBERTS

Pottery of the Pagosa-Piedra Region

BY J. A. JEANCON

(Continued from the July Number)

Plain and Elongated Flower Pot Forms

Two rather curious forms are those of the plain and elongated flower pot. Only one specimen of the former was found and it is from one of the first pithouses explored. Fragments of others were found later, but not enough of any one piece to reconstruct it; however, the sherd was large enough to establish its original form and show that it was not an especially rare one. The one (Plate 20, C, and Fig. 12), is 2⅜ inches in height by 3 inches in width at the bottom and 4½ inches at the top. The paste is hard, of a dark grey color, and it appears to have been covered with a very thin slip or wash of which the original color is practically effaced, leaving only a dirty grey surface.

Dr. Fewkes describes a similarly shaped piece which he calls a saucer; it was found at the Four Mile ruin in Arizona (Fig. 12).[14] He figures another one similar in form as having been found in the Nantacks. It is, however, coiled on the outside (Fig. 12).[15] Judging from the illustrations of those found by Dr. Fewkes they are of about the same dimensions as the one from the Pagosa-Piedra region.

Later on the low walls of the pots were raised and we find specimens as are shown on Plates 8, B, C, and 10, A. One of these on Plate 8, B, is coiled, with a fine indented coil running about three-fourths of the way up from the bottom and continuing from there in plain broad coils to the top. The paste of this one is very hard and of a yellowish color. There is another one similar to this shown on Plate 10, A.

The other pot of the elongated flower pot form does not show the coiling, but was smoothed off with a corncob, the striations showing very plainly. It is of much softer paste and in a general way much clumsier (Plate 8, C).

[14]Fewkes, Dr. J. Walter. Two summers' work in Pueblo ruins. 22nd Ann. Bureau of American Ethnology. Page 142.
[15]Ibid. Page 188.

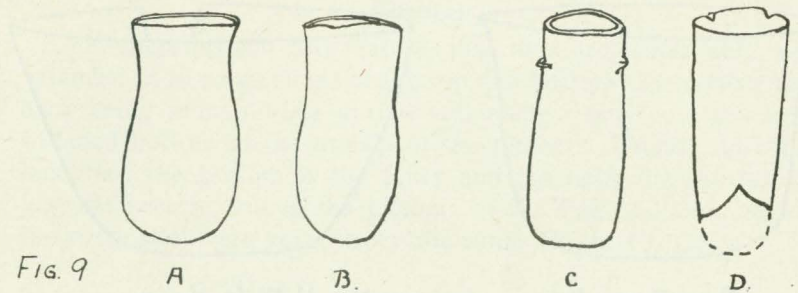


FIG. 9

FIG. 10.

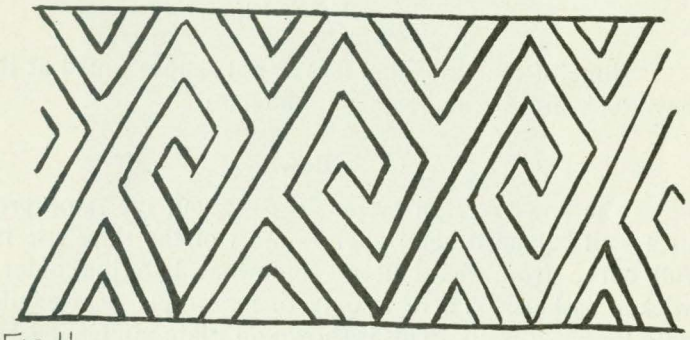


FIG. 11

Figure 9, A, B—Pagosa-Piedra elongated flower pot shapes. C, D—Chaco Canon cylindrical shapes. After Pepper.
Figure 10, A—Taos. From unpublished report on Taos, New Mexico, by J. A. Jeancon, 1920. B—Pagosa-Piedra. C—Chaco Canon, after Pepper, page 278.
Figure 11—Pueblo Bonito, George Pepper, Figure 121, page 278.

The forms of all of these are very similar to some modern ones made by the Navajoes and the Apaches and used by them for drums as well as for cooking. It is also interesting to note the similarities of these forms to those of the Chaco which Dr. Pepper calls the cylindrical forms. The only real difference appears to be the shape of the bottom of the vessels and the absence of the lugs or handles in the Chimney Rock specimens (Fig. 9, C, D).[16]

[16]Pepper, George H. Pueblo Bonito. Anthropological Papers of the American Museum of Natural History.

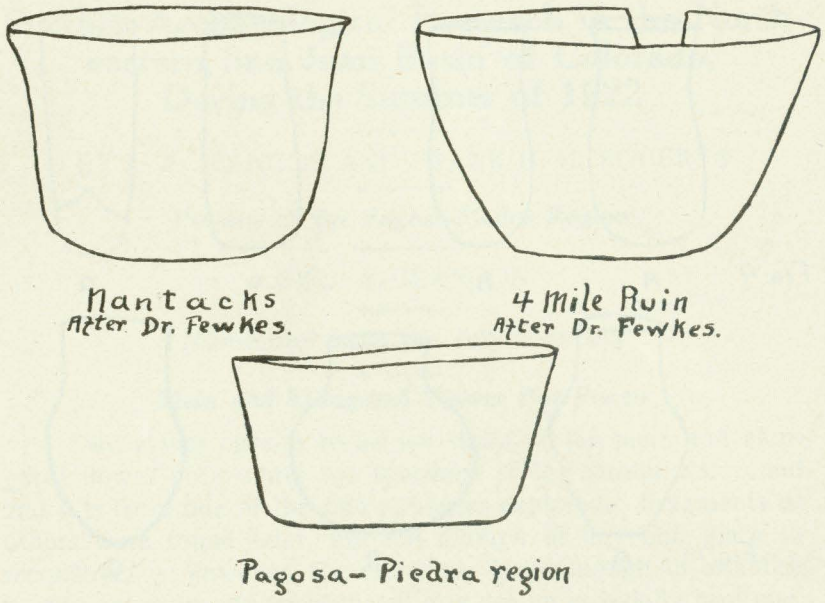


Figure 12

None of the elongated flower pot shapes found at the Chimney Rock are of the black on white ware.

Bowls

The bowls are all rather deep—about the same proportions as a well balanced hemisphere. Most of the sides rise in a good full curve from the bottom somewhat like the older Apache wicker baskets. There is only one example of a shallow bowl with long low walls. This is shown on Plate 20, C, and Figure 12.

While possibly not belonging properly in the class of bowls, there is one vessel of such unusual form that it does not seem to fit in any other section. This is shown on Plate 8, D. When it was first set up it was supposed to be the bottom of a coiled vessel, but upon closer examination it was found that the rim is finished off in a manner that would indicate that there never was anything above it and that it is a true rim. The form is interesting in that it might be an enlarged idea of a bowl with a conical bottom. The paste is fair although it has a large content of sand. The exterior and interior were smoothed off with a corncob and the striations show plainly. It is 8 inches in height and 12 inches at the greatest diameter. Whether this preceded or followed after the shallow food bowls is a question that we could not decide, as it was found in the same room with well decorated black on white bowls (Plates 9, 13).

Pitchers

Pitchers present this feature, that they are remarkably well balanced as to proportions of the top and bottom; the contracting neck being more or less abrupt and rising from the top of the widened bottom at the middle of the pitcher. Usually, in other localities, the bottom is the taller and the neck the shorter, or just the reverse, but in the pitchers of the Pagosa-Piedra region the proportions are very nearly the same (Plate 19, C).

Water Jars

Water jars are of two types, if we exclude the eccentric bladder-shaped one. It is the writer's opinion that this is a freak and not a usual form. It will be given a separate paragraph in the proper place. The early forms have already been described. They refer to the undecorated pieces. Those given below are decorated.

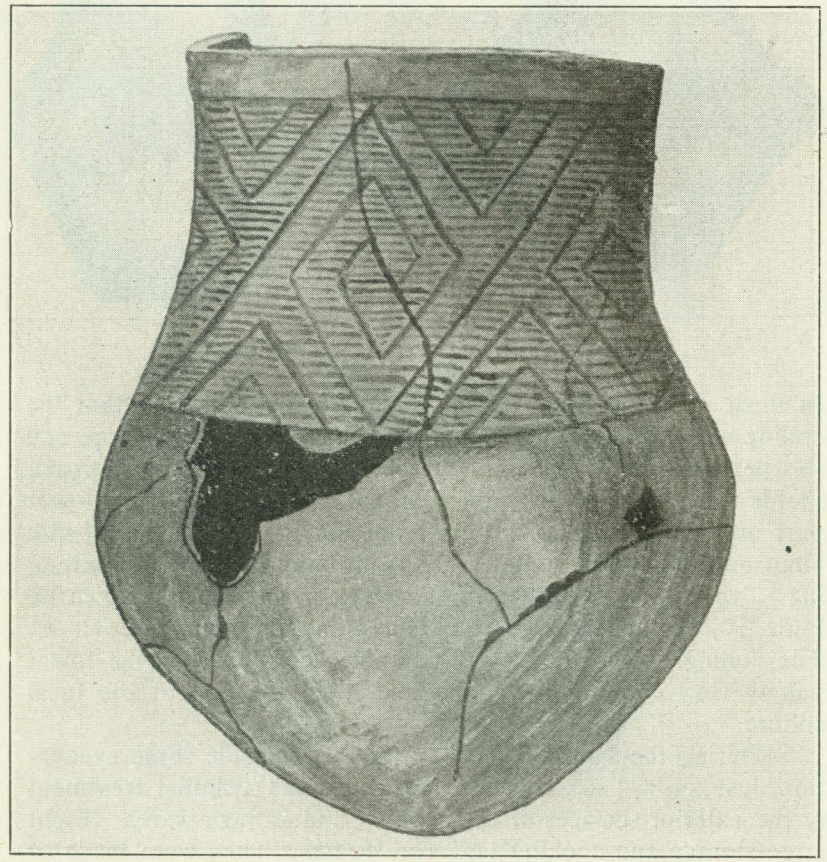


Figure 13. Pueblo Bonita. George Pepper. Fig. 121, p. 278

The first form of decorated water jar is shown in Plate 19, A. It is more or less conventional, although the proportions are somewhat different from those of other localities. The second form, as shown on Plate 19, B., is a wide-mouthed, full-bellied one, very graceful and resembling those of the modern Santa Clara, San Juan and San Ildefonso open-mouthed jars.

Coiled Wares

As has been said before, the coiled ware is of unusual interest on account of its variety of technique and paste. There seem to have been two distinct expressions of zoning in the coiled ware.

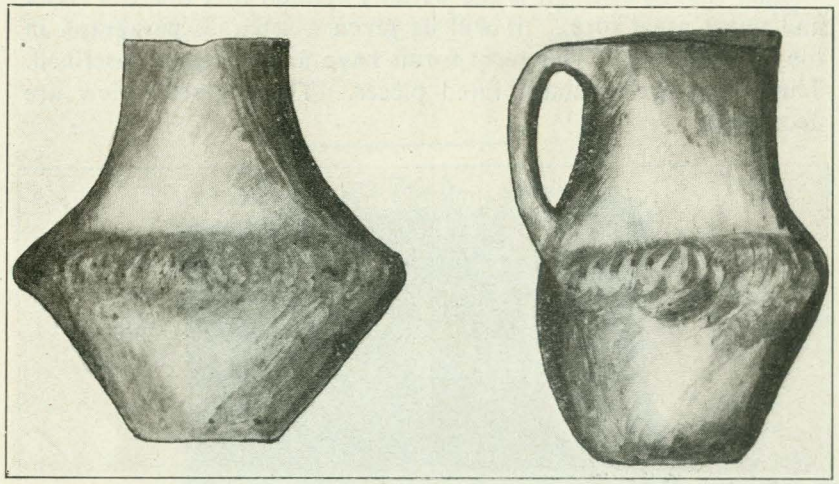


Figure 14. La Boca. Front and Side Views

In most of the pithouses sherds were found indicating that the coiling was carried from the bottom of the vessel to the top, and this persists all through until the end of the occupation. Again, sherds were found in the same pithouses indicating that the lower part of the vessel was smoothed off and of globular form with almost straight rising coiled walls from half way up and continuing to the rim. A fully restored vessel of this type is shown on Plate 10, B., and a large fragment of another on Plate 10, C. The coiling of the upper half and the smoothing of the lower half is very common from the middle to the end of the local culture.

During the summer of 1920 the writer made some excavations just below Taos, New Mexico, and found a similar treatment of the exterior surfaces of the cooking and storage wares. Eight large storage and cooking jars were found. They were made of a very coarse friable paste, the upper half of the exterior surface

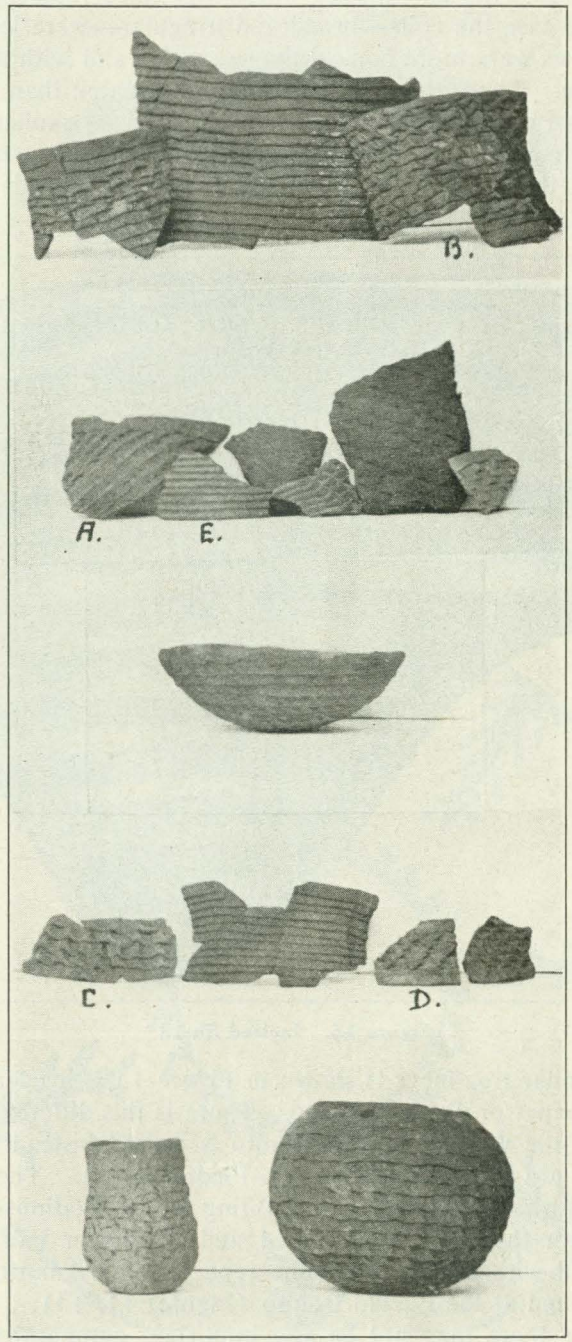


Plate 21. Coiled Ware

had obscured coils and incised horizontal lines replacing them, and in one case the coils—broad and irregular—were left. The lower halves were more conical than globular and with a slightly flat bottom. The forms were also more elongated than those of the Pagosa-Piedra region, but the zoning was very similar. They had the same wide open mouth, but the sides contracted more rapidly as they rose from the medial sections towards the top (Fig. 10).

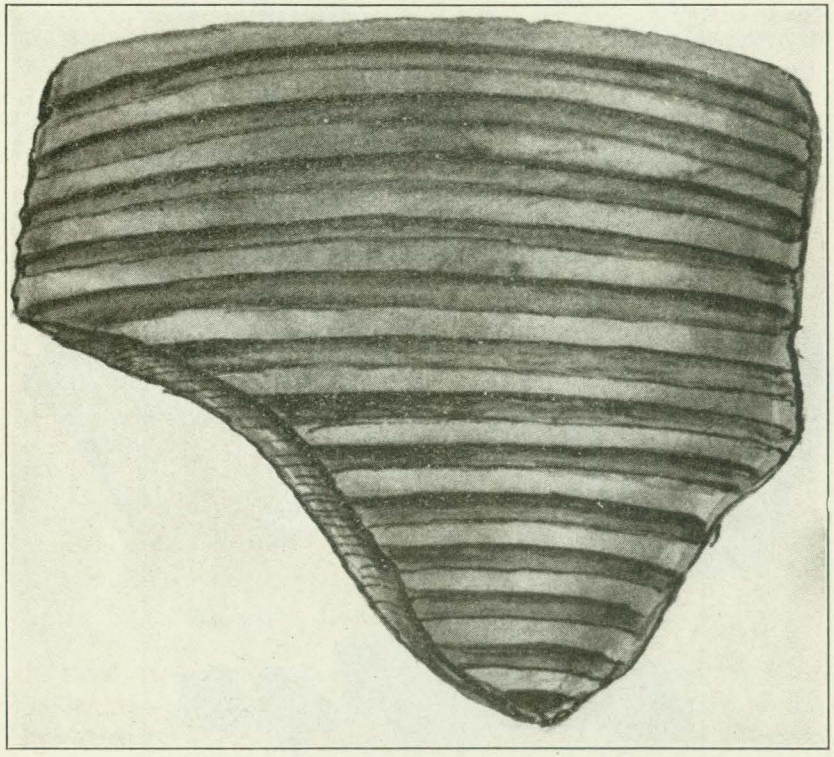


Figure 15. Incised Sherd

A similar treatment is shown in Figure 13, copied from Dr. Pepper's paper on Pueblo Bonito. There is this difference, however, that the vessel found at Bonito is incised instead of being coiled, as are those of the Pagosa-Piedra region. The conical bottom is also slightly different. During the excavations of 1922 vessels with the upper half coiled and the lower half smooth were found with exactly the same type of conical bottom as in the one found at the Pueblo Bonito (Figures 11, 13).

While there may not be any important comparative value in the mentioning of these resemblances in widely separated areas, still the comparison is not without interest.

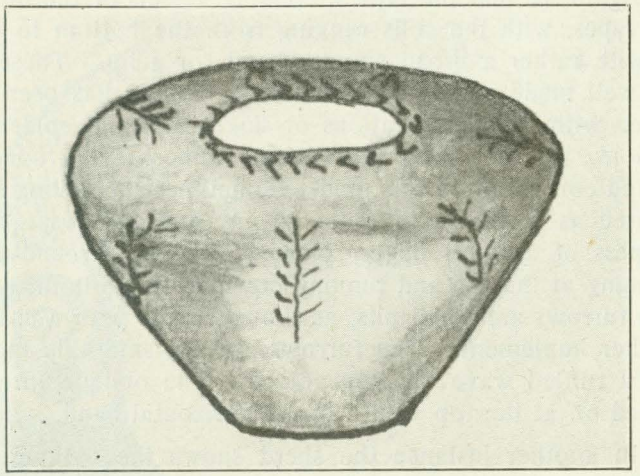


Figure 16. Incised Jar. Diameter 3 Inches, Height 3 Inches

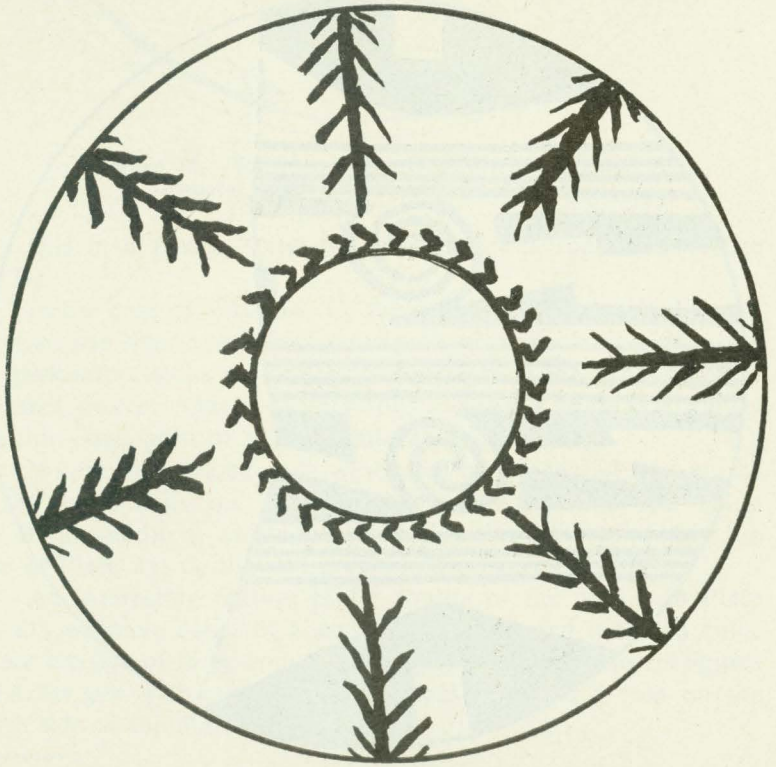


Figure 17. Incised Jar

Again we find the typical cooking vessels of the most ordinary types, with the coils running from the bottom to the top, and with rather a broad smooth band for a lip. These are all very well made and in some cases the coiling has been supplemented with stick indentations or finger nail and epidermis impressions. As has been said before, almost every conceivable coil and coil variation was used. Sometimes the coiling is partly obscured as is shown in Plate 21, A, and furrows, about the thickness of a small finger, plowed obliquely around the pot, beginning at the top and running down to the bottom. In these small furrows are small pits, as though made with a sharp stick or other implement. The furrows are not smoothly made, but have a ruffled wave-like appearance. The oblique furrows are finished off at the top with a broad horizontal band.

In another instance the sherd shows the oblique furrows without any attempt at eradication of the horizontal coils, thus making a very curious mixture. The general appearance of the furrows indicate that they were made with the finger while the

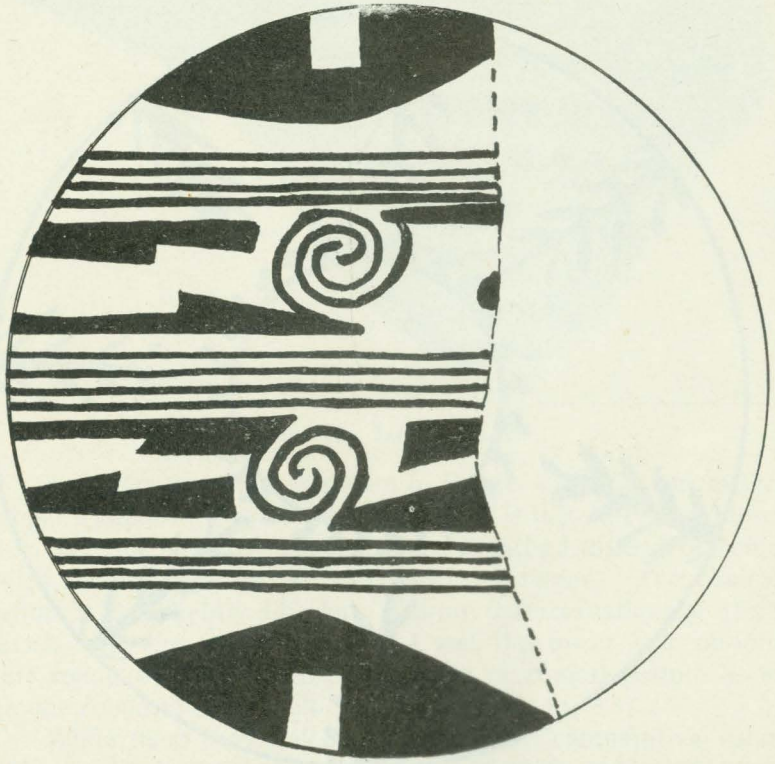


Figure 18. Black on White Ware. Fragment of Dipper Bowl. Diameter 4⅛ inches, Depth 2¾ Inches

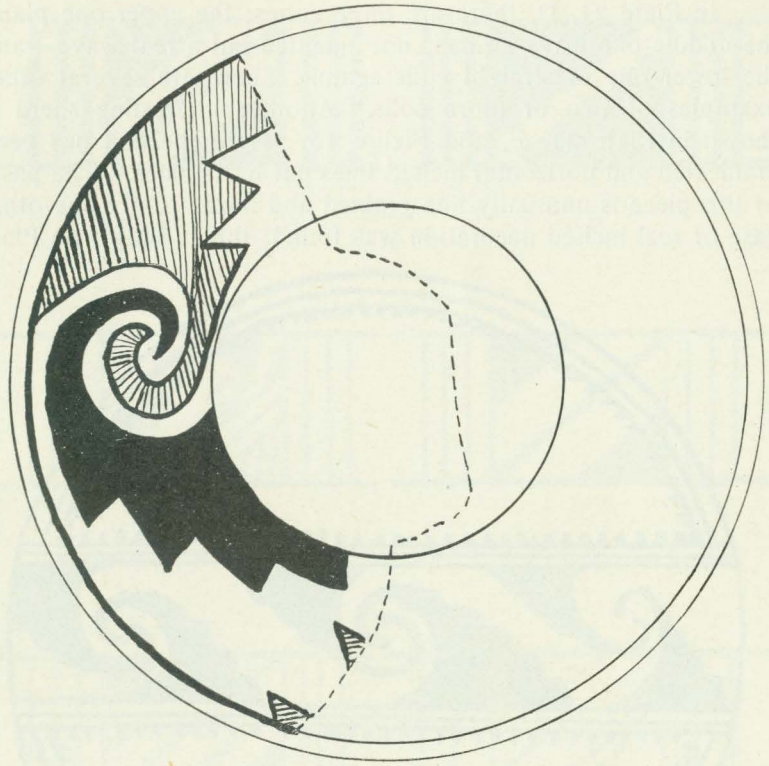


Figure 19. Black on White Bowl, Brownish Cast Diameter 10 inches, Height 4½ Inches

clay was in a plastic state and before it was sun dried (Plate 21, B).

In the case of Plate 10, C, the coiling was very regular and narrow; the fillet averaging one-eighth of an inch in width, and the stick impressions are so regular as to give it the appearance of a basket weave. Out of twenty coils measured, there was hardly one thirty-secondth of an inch difference in width.

Where very broad coils were used and indented, the marks of the finger nails and epidermis suggest that almost the whole top of the thumb or finger was used in making the print. In the case of Plate 21, C, the coil is one-half of an inch wide.

An interesting feature is the zoning of the coils. In Plate 10, D., we have zones of alternating straight and indented coils. There are five of these zones on one pot. Mr. Earl Morris figures a similar pot with six zones which was found in a ruin on the south side of the Mancos river.[17]

[17]Morris, Earl H. Antiquities of Southwestern Colorado. 33rd Ann. Bureau of Amercan Ethnology.

In Plate 21, D, there are three zones: the upper one plain, the middle one wavy—this is not indented but a real wave—and the lower one of straight coils again. There are several other examples of two or more coils. Another interesting sherd is shown in Plate 21, E, and Figure 15. Here the coil has been eradicated and horizontal incised lines put in its place. The paste of this piece is unusually fine grained and hard. Only one other case of real incised decoration was found; this is shown on Plate

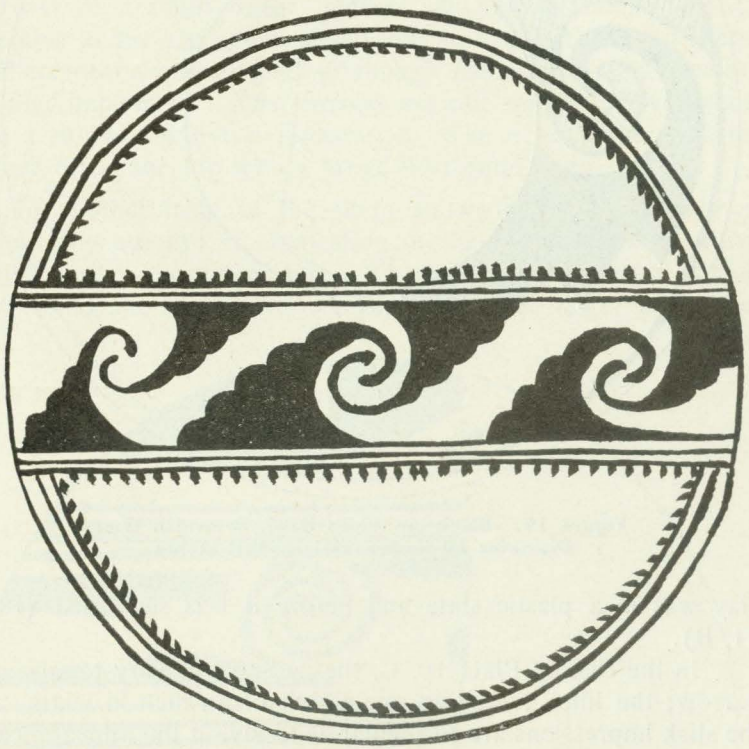


Figure 20. Black on White Bowl, Blue Undertone Diameter 3⅜ Inches, Height 3½ Inches

20 and Figures 16 and 17. The fern-like elements of this design are strangely suggestive of the incised ware of the Jemez Plateau. The paste of the vessel also resembles that of the finer biscuit ware of the same locality.

Black on White Ware

The black on white ware offers a number of problems that will require more specimens than are at hand at present to solve. As the first attempts at slip and smear have been taken up earlier in this paper, it will not be necessary to go over that ground again. Suffice it to say that all of the earlier pieces are crude, in some cases exceedingly so. Hatchured designs appear, from

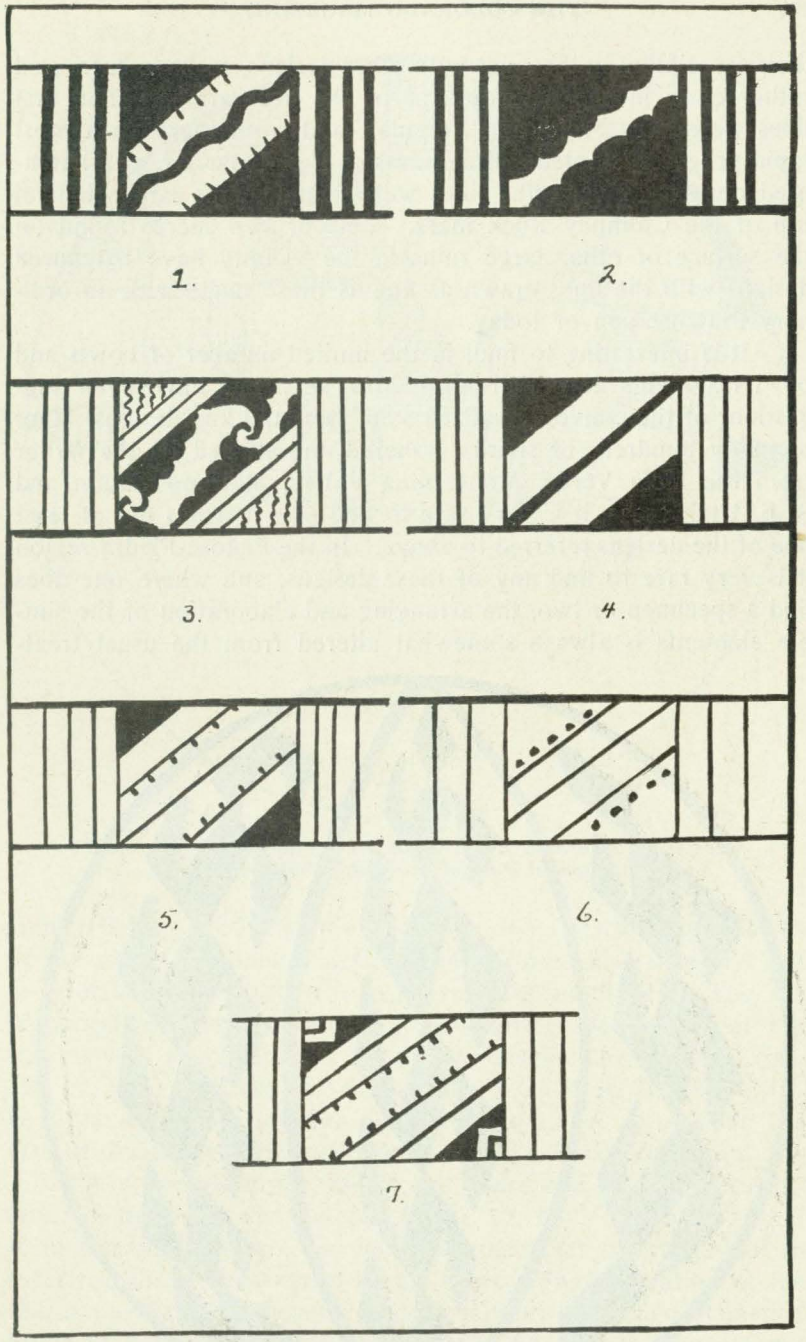


Figure 21. Nos. 1, 2, 3—Pagosa-Piedra Region. Nos. 4, 5—Jemez Plateau, Chama Valley, Season 1919, Bull. 81, B. A. E., J. A. Jeancon. No. 6—Jemez Plateau. Pottery of the Jemez Plateau, etc. A. V. Kidder, Am. Anthrop. Assoc. Mem. No. 2, Plate XV. No. 7—Sitkyatki. Expedition to Arizona in 1895. Dr. J. Walter Fewkes, 17th Ann. Bur. of Amer. Ethn., Plate CXXXVII.

their association in the ruins with other designs, to have been used rather early in the development of the decorations. The first lines were very broad and irregular, and from there on a most rapid progress is noted. Fragments of a globular jar with hatchured designs of very fine lines were found in the large ruin on top of the Chimney Rock mesa. One or two sherds found on the surface of other large ruins in the vicinity have hatchured designs with the lines drawn as fine as those made with an ordinary drawing pen of today.

It is interesting to find, in the limited number of bowls and bowl fragments at our disposal, how very few have even suggestions of the conventionalized step, fret, and key designs. Out of many hundreds of sherds gathered and studied by the writer from the Mesa Verde, Montezuma Valley, McElmo Canon and S. E. Utah areas, it is very rare to find one that has not at least one of the designs referred to above. In the Pagosa-Piedra region it is very rare to find any of these designs, and where one does find a specimen or two, the arranging and elaboration of the simple elements is always somewhat altered from the usual treat-

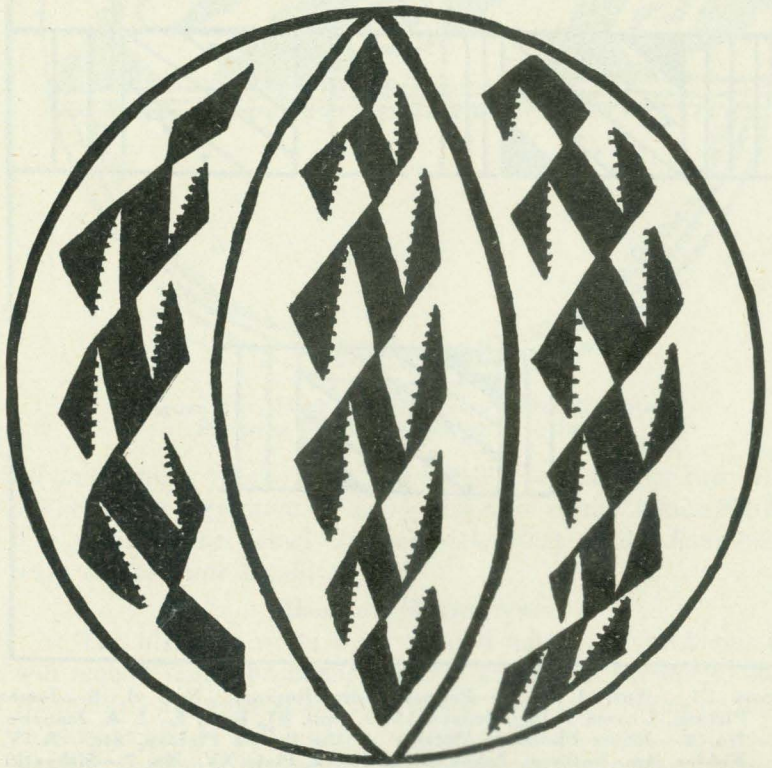


Figure 22. Dipper Bowl, Double Handle. Black Has Faded to Deep Blue. Diameter 5½ Inches by 4¾ Inches, Depth 2¾ Inches

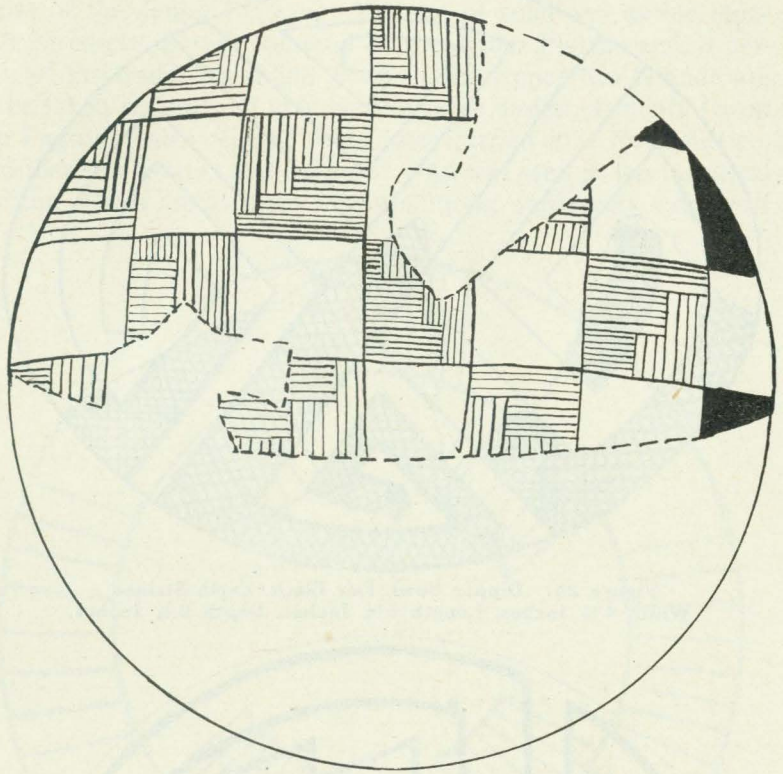


Figure 23. Black on White Ware Bowl, Brownish Undertone Diameter 10 Inches, Depth 5 Inches

ment (Plates 18, 19, Figures 18 to 24). The interlocking features of the step, fret and key designs are followed in a way, but not in as elaborate a manner as in other areas mentioned. The use of curvilinear design elements in decorating the interior of the bowl is very simple and yet retains the interlocking feature (Figs. 18, 19, 20). This is also shown on Plates 9, A, B, 18, B, 19, D. The zoning of the one marked Plate 13, A, is unusual, the idea of dividing the interior into three parts is not common.

Only one example was found where the whole of the interior of the bowl was covered (Plate 13, E). It is not unusual to find examples where the decoration occupies from one-half to three-fourths of the interior of the bowl. The illustration of the sherds on Plate 13 shows a curious mixture of design elements. Some of these are strongly suggestive of later Hopi elements and yet are unlike them, the suggestion being more or less elusive (Plate 13, B).

The sherd shown on Plate 13, C, with the interlocking birds and the one with the dotted triangle (Plate 13, D) approach

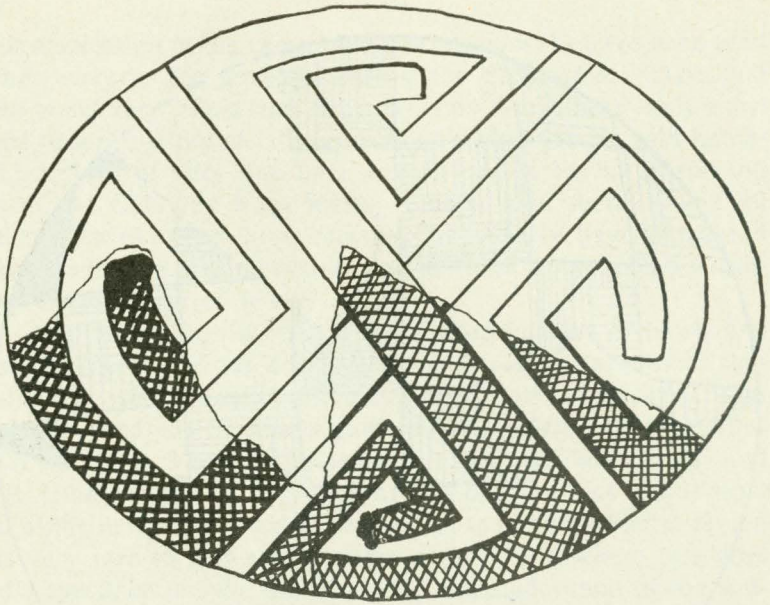


Figure 24. Dipper Bowl, Fair Black, Earth Stained
Width 4½ Inches, Length 5⅝ Inches, Depth 2¾ Inches

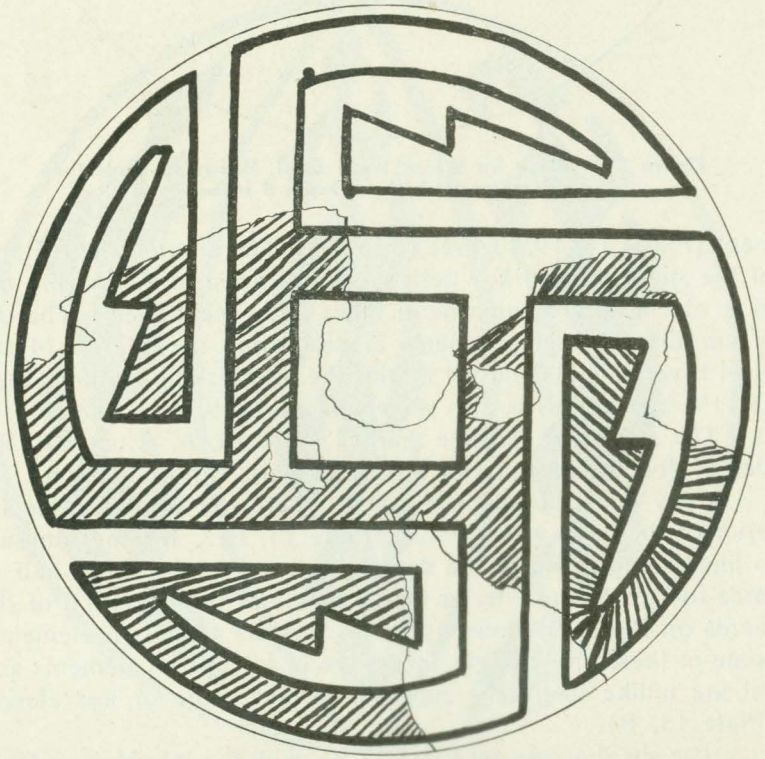


Figure 25. Dipper Bowl, Black on White Ware
Width 9 Inches, Depth 4½ Inches

those of the Jemez Plateau. The use of solid and dotted elongated triangles is very common on the Jemez Plateau and, if certain of the traditions of the Tewa of the Upper Rio Grande are to be taken seriously, it may be that these design elements (from the Pagosa-Piedra region) were later carried into New Mexico, and there elaborated and extended. As was seen in the historical portion of this report there were traditions, apparently worthy of

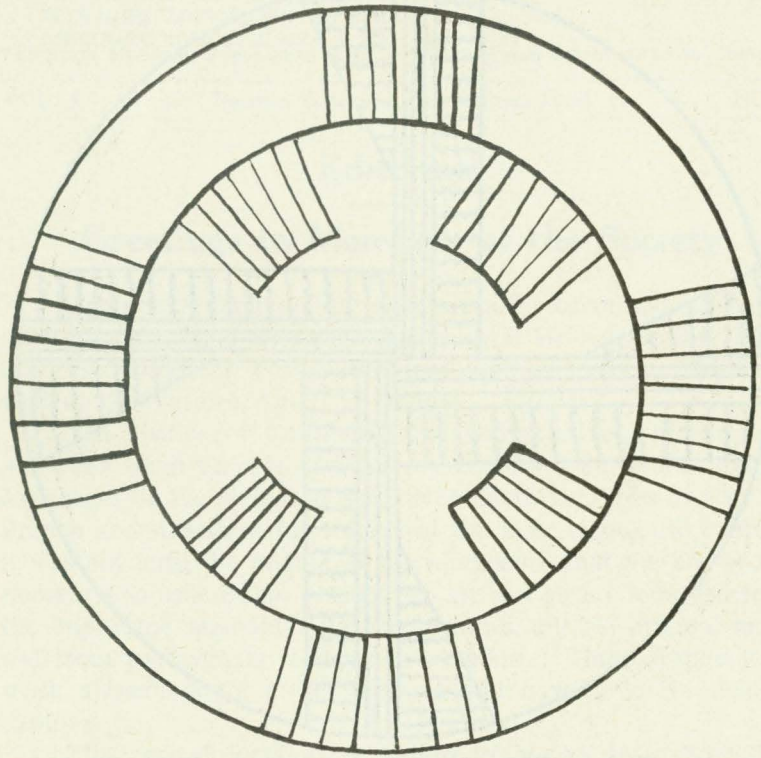


Figure 26. Black on White Bowl

consideration, of the previous occupation of this part of the country by the Tewa, which were told to the early Spaniards prior to the expedition of Escalante in 1776.[18] The writer has also been told stories of the coming of the Tewa from the far north, and of their sojourn in southwestern Colorado en route to the Jemez Plateau. All of this may have some bearing on the carrying of design elements from the Pagosa-Piedra region to the Jemez Plateau. Just south of the bend of the San Juan river, in southwestern Archuleta county, is a section of country entering New Mexico which would afford an excellent place for the prehistoric

[18]Twitchell, R. E. Archives of New Mexico. Page 279, Vol. II.

peoples to pass through to the Gallinas country and from there, by way of Chama Valley, to the Jemez Plateau. From the writer's personal research in that country and from creditable reports furnished him, there is every reason to believe that some such migration took place, as there is a complete line of ruins of a similar character following the route given above. While no

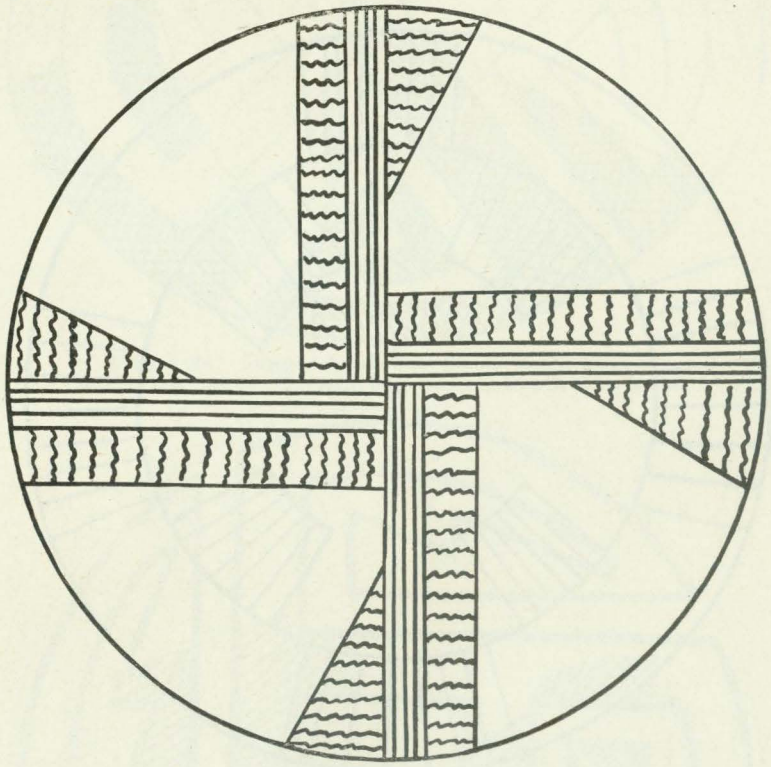


Figure 27. Black on White, Very Much Overfired. Width 7½ Inches, Depth 3½ Inches

serious study of the sherds along the route have been made, still some superficial studies show more or less of a transition in the pottery.

The spacing off of the panels on the two pitchers (Plate 19, C) is so typical of the Jemez Plateau way of doing that it cannot well be overlooked. This is emphasized by the number of lines used to separate the panels in both areas, four lines being the usual number, although one sometimes—rarely—finds three or five (Fig. 21).

(To be continued)