



Catawba Pottery-Making, with Notes on Pamunkey Pottery-Making, Cherokee Pottery-Making, and Coiling

Author(s): Vladimir J. Fewkes

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CATAWBA POTTERY-MAKING, WITH NOTES ON PAMUNKEY POTTERY-MAKING, CHEROKEE POTTERY-MAKING, AND COILING

VLADIMIR J. FEWKES *

University Museum, University of Pennsylvania

(Read by title November 22, 1941)

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INTRODUCTION

THE contemporary descendants of the Catawba Indians, a remnant of the Eastern Siouan-speaking stock, live on a state reservation near Rock Hill, York County, South Carolina. The "nation," as the natives like to refer to the reservation group, preserves several prominent survivals of aboriginal culture. Particularly noteworthy among these is pottery-making. Since 1884, the date of the first written record of the craft by a dependable observer (Palmer's notes, *vide infra*), Catawba women have been repeatedly mentioned as skillful potters. Collections of pottery representing the interim reveal unmistakable uniformity in style and in technical details. Moreover, the modern product has very close similarities, if not full analogies, among archaeological remains found at sites known to have been occupied by the Catawba in early contact times or even before the whites appeared. This circumstance renders the study of the Catawba potter's craft particularly attractive from the culture historical point

of view. The usefulness of such an inquiry may be profitably increased by considering the status of pottery-making among the Cherokee of the Smoky Mountains in North Carolina, and among the Pamunkey of Tidewater Virginia. These groups still practice the craft along old traditional lines, and both have been exposed to Catawba influences through intermarriage and intercommunication.

The purpose of this publication is to examine contemporary Catawba pottery-making; to investigate its history by projecting retrospective inquiries as far back as positive evidence permits; and to consider, strictly objectively and within practical limits, pertinent comparative and supplementary data. The notes on coiling became an inevitable addition with which to approach the task of classifying construction in hand-made pottery.

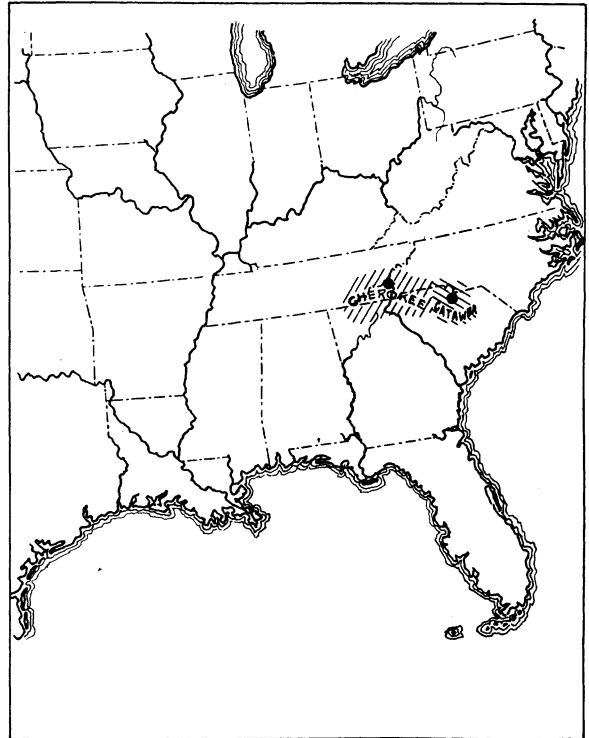
In the United States, the study of either archaeological or ethnological pottery has been coordinated into a rational discipline; currently, several serious and well-qualified investigators are pursuing researches which promise further advancement. The pioneering efforts in the field must be credited to the late Dr. W. H. Holmes, who over 50 years ago began to publish his studies, of which several should ever enjoy the

* Owing to the death of Dr. Fewkes on December 11, 1941, after the completion of this manuscript but before the arrangement of the figures Mrs. Lucile Serrem Pater-son, who had worked with Dr. Fewkes on the manuscript shortly before his death, arranged the figures and inserted references to them in the text.

reputation of classics. It is in point to recall that his studies were continental in scope, that they embraced archaeological and ethnological evidence alike, and that they concerned themselves also with lithic, textile, and other domestic industries. Perhaps some of Dr. Holmes's shortcomings may be attributed to the inevitable dangers inherent in such widely spread and diversified work. In any case, he covered several areas in considerable detail, and his contemporaries or immediate successors carried on quite successfully. In the East, several accounts of surviving native pottery were prepared, and some attempt was made to connect certain modern wares with archaeological material. The Mississippi Valley received little attention from the time Holmes published his famous "Aboriginal Pottery" (1903) until Federal Government appropriations of recent years helped to develop extensive exploration programs. In the Southwest, however, favorable circumstances stimulated pottery studies and attracted many specialists. Dr. A. V. Kidder may well be called the Nestor of modern research in Southwestern pottery. His acumen, foresight, and profound scholarly attitude, coupled with rich field experience, rendered him eminently fitted for the mission. This was to prepare the ground for, and to initiate the practice of research in, pottery technology. As a part of Dr. Kidder's program, Dr. C. E. Guthe published his splendid "Pueblo Pottery Making" (1925), which is replete with minute details of manufacturing steps. Then appeared Miss A. O. Shepard's "Technology of Pecos Pottery" (1936), as part of Dr. Kidder's second volume on Pecos pottery. Miss Shepard describes the aims and methods of the research, examines critically the glaring errors committed in subjective interpretation, and presents convincing proof of the practical and indisputable value of technological pottery analysis. Such work is entirely scientific, devoid of personal reckoning, and fortified by standards derived from repeatedly demonstrable principles.

Thus the study of pottery is now facilitated by excellent descriptive and detailed analytical reports based upon a thoroughly objective approach. It is this quality that distinguishes the modern work from so many earlier studies which, however well intentioned, are not always free from subjective treatment.

The value of scrupulously observed objective methods in pottery studies is the more pronounced in view of the technicalities of the sub-



MAP 1. Approximate locations of Cherokee and Catawba nations. Shaded areas: territories in eighteenth century. Dots: present locations of East Cherokee and Catawba reservations.

ject. Technological work pursues precise determinations by employing various means of investigation proved dependable in other endeavors of cognate aims. The analytical data are compiled not necessarily for classificatory purposes; rather they provide indices of qualitative and quantitative properties of the analyzed specimens. The usefulness of such data, as against the pitfalls of subjective deductions, is quite obvious. There is no excuse for speculation in such matters as nature and sources of clays and temper, chemical and physical composition, or optical properties; and one can also be fully objective in dealing with conquests, dates, diffusional trends, migrations, trade contacts, etc. If the positive evidence at hand is insufficient to yield the necessary data for answering these questions, no attempt is made to substitute opinions. That pottery in itself, no matter how well analyzed, has its own limitations in culture historical investigations, is readily admitted. The signal factor to stress is that studies of pottery in general, excepting aesthetic values, lend themselves to a full application of the principles of scientific procedure; technological analysis,

as convincingly demonstrated, operates with precise scientific methods. And yet, irrespective of the remarkable refinements reached in technological pursuits, of the splendid body of factual data compiled, and of the standards established, the laboratory work is only one part of the picture. For it is equally interesting and important to know how a given pottery was actually manufactured. In this regard, the scope of technological endeavors may be most profitably enlarged by specific detailed studies of contemporary pottery-making among aboriginal survivals. In the United States a very fruitful field exists for such investigations, with several Indian groups still practicing the craft under traditionally retained principles of aboriginal methods and techniques.

My initial field work in the subject matter here treated dates back to February, 1929, at which time it was my privilege to accompany Professor Frank G. Speck to the Catawba reservation.¹ Favorable circumstances enabled me to observe, even during the first visit, virtually all the different processes and procedures practiced by the potters. Subsequent observations and compar-

¹ Acknowledgments:

It gives me pleasure hereby to express to Professor Speck my gratitude for his counsel and advice.

The most significant segments of my studies resulting in the present publication became possible through the following generous grants. In 1939 and 1940, the Society of the Sigma Xi, Pennsylvania Chapter, favored me with funds toward specific technical work. A grant from the American Philosophical Society in 1941 enabled me to pursue further field work and to complete the manuscript.

To Mr. Donald Horton, Yale University, Mr. Frederick R. Matson, Jr., University of Michigan, Mrs. Lucile S. Paterson, University Museum, University of Pennsylvania, and Miss Anna O. Shepard, Carnegie Institution, I am greatly indebted for reading either provisional or final drafts of the manuscript and for many valuable suggestions. Mrs. Paterson also helped in proofreading.

During some of my field work, I had the pleasant company of Mr. Joffre L. Coe, University of North Carolina, whose knowledge of local culture history and skill in photography were very helpful.

To the University Museum, University of Pennsylvania, I am particularly obliged for the use of its technological laboratories as well as for certain photographs and drawings. The Peabody Museum, Harvard University, favored me with a number of photographs. Specific acknowledgments are stated in appropriate explanations of the plates. The photographers were Reuben Goldberg, University Museum; Fred P. Orchard, Peabody Museum; Joffre L. Coe, University of North Carolina. The drawings were prepared by Mr. J. S. Benditt of the University Museum.

To my wife, Berenice, I owe profound gratitude for sustained help in the preparation of the manuscript, and for the inspirations derived from her untiring interest to aid me in every possible respect.

My studies extended the intermittent inquiries into August, 1941, at which time I last visited the Catawba (and also the Cherokee). The sum total of the successive investigations corroborates the initial findings in principle. The most recent field work, naturally, was directed toward a general collation and especially toward an understanding of the contemporary status of Catawba and Cherokee pottery-making.

The population of the Catawba reservation, as estimated by Chief Sam Blue in the late summer of 1941, numbered about 260 souls, representing some 60 families. With the aid of Mr. Irving Brown, 33 families were counted as pottery-makers; that is to say, at least one woman in each was deemed to be fully acquainted with the native processes. The seasonal absence of the younger women from the reservation rendered an accurate check rather difficult if not impossible to obtain, but it seems to be a fair estimate to state that some 70 female members (more or less) of the "nation" know how to make native pottery. In any case, the chief informants from whose work and information the data here presented have been drawn, and the most dexterous performers, were the following (status of August, 1941):

Lula Beck	Rachel Brown	Georgia Harris
Doris Blue	Fannie Canty	Mary Plyler
Louisa Blue	Eliza Gordon	Arzada Sanders
Edith Brown	Sally Gordon	Lillie Saunders
		(now Bryson)

Despite modern influences, the task of the Catawba potter remains unaffected; the craft is based on the principles of an ancient technique and certainly appears to be neither dormant nor decadent. A distinct consciousness, and indeed pride, are clearly manifested by the contemporary artisans, whose skill and aesthetic sense reflect a deeply rooted control of their endeavors. Local archaeology, although very unsatisfactorily known thus far, supports the view that much of the aboriginal technique is being traditionally retained. The recent archaeological field work of the University of North Carolina, under the direction of Joffre L. Coe, has helped to identify several historic sites. Among them are early eighteenth century locations, long since abandoned, which reliable sources ascribe to the Catawba. The pottery found at such sites includes mottled polished ware which in construction, surfacing, and firing closely resembles the modern Catawba product.

Pottery-making among the Catawba is essentially a woman's calling. Occasionally men participate in the digging of clay in natural deposits, a task which often calls for considerable labor, but with the completion of this process their share is usually finished. The various steps of manufacture appear to be a common tribal property on the reservation, and the craft is handed on more or less through family lineage. Sometimes newcomers are instructed by seasoned artisans.²

Naturally, individual dexterity is often responsible for certain deviations from the otherwise well-established standards. On the whole, however, the technique is essentially uniform throughout the reservation, and with negligible exceptions the final product differs very little from household to household. Yet, individual potters are able to recognize quite readily the results of their own labor even if their ware be mixed with that of others, although no individual identification marks are used.

The pottery-making season normally lasts from early spring to late fall. Frost is to be avoided, but even in the winter some activity often continues indoors. In the summer, drying is naturally facilitated and, usually, the livelier marketability of the product increases demand. While some seasonal fluctuation in production thus results, the natural limitations imposed by weather conditions are not a very serious drawback to pottery-making throughout the year.

The contemporary Catawba have no tradition regarding the origin of their pottery. No suggestions of a likely explanation are known from their myths and lore, nor are there traces of a record in extant sources which might elucidate this point. The following creation belief, however, is of some interest in this relation, although not exclusively a Catawba occurrence. "In the beginning the creator modeled a man from clay and proceeded to fire his product. The fire was too low and

when finished the figure was very light in color. That was the white man. In a second attempt, too much fire and heat scorched the figure—that was the black man. The creator then tried a third time. He gave much care to the fire and arrived at a perfect result—the red man."³ The absence of a native explanation of the origin allows very little in the way of tangible deductions. Mrs. Sally Gordon, confronted with a request for an elucidation regarding her own conception in the matter, responded somewhat as follows: "Really, I do not know. But I have heard it said that our people knew how to make pots and how to grow corn since a very long time ago." Other people at the reservation declined to venture on any conjecture. The question of the origin of Catawba pottery remains open; indeed, it appears to be a moot one.

My purpose is to present an account of the pottery-making technique observed at the reservation and of the general information furnished by the natives upon specific inquiries.⁴ The description follows the procedure employed by the potters, and the various steps are arbitrarily arranged under eight headings:

- Acquisition and treatment of raw material
- Process of manufacture
- Forms
- Surface finish
- Decoration
- Drying process
- Firing
- Post-firing treatment

METHODS AND TECHNIQUES OF CATAWBA POTTERY-MAKING

ACQUISITION AND TREATMENT OF RAW MATERIAL

NATURAL CONDITIONS AND SUPPLIES

Within the physical environment of the Catawba there are no serious handicaps to finding adequate beds of clay suitable for the needs of

² The case of Mrs. Lillie Bryson (formerly Mrs. Saunders) presents an interesting example in point. Lillie, originally a descendant of the Cherokee (born in northern Georgia), married Joseph Saunders on the Catawba reservation. At the time of her arrival she knew little about pottery-making. Yet within a very short time she acquired, largely through the teaching of Mrs. Sally Brown, a thorough knowledge of the local craft. Her products fully conform to Catawba standards. After the death of Joseph Saunders, in 1930, Lillie removed to the Cherokee reservation (Swain County, North Carolina), and married Saunook, an officer of the Cherokee tribe. At the present time she is Mrs. Bryson, and lives at Ela, some 6 miles from the village of Cherokee. She continues to make Catawba-style pottery.

³ The Catawba do not associate this myth with pottery origins. (I may add that a practically identical version was told me by a Delaware from Oklahoma.)

⁴ Catawba linguistic equivalents for the clays, implements, tools, etc., are not included here; the reader may find these in Speck (1934; 47-48 (clay-eating) and 70-72 (pottery-making)) and in Harrington (1908a: 402 ff.). (Some of the terminology published by Harrington (1908a) requires revision.) For literature on Catawba pottery, see Holmes (1903) and Harrington (1908a). Pennypacker (1937a) is to be dismissed because of its inadequacies and amateur quality.

the potter. Exposed sides of hills and ravines, hilltops, banks of streams, and occasionally eroded surfaces, are relatively easily accessible. In these, the women potters, usually aided by men, locate the potential sources to be exploited. Under these favorable circumstances a ready supply of clay is always close at hand. Abundant raw material may be obtained within the limits of the reservation or near it.⁵ There are no restrictions on the exploitation of the clay beds. Irrespective of land ownership and, apparently, notwithstanding possibilities of trespassing, clay-bearing deposits are free for public use. Some clay beds are situated on land belonging to Negroes and are being exploited by the Catawba without any compensation.

CLAY PITS

Apparently because of the labor involved, the actual digging of clay is done by men, but women, *i. e.*, the potters, attend to the immediate sorting and picking at the source of supply. At times the pits are carefully covered⁶ to protect them from rain washes, and often they are concealed and guarded.⁷ A given pit need not be exploited for a long period of time.⁸ The location of the water table, the thickness of overlying strata, the accumulation of ground or rain water, and general accessibility, are among the decisive factors in this regard. The natives concentrate on a pit, as Harrington points out, "until it becomes troublesome to keep free from water, then abandon it and begin another one nearby."⁹ Sometimes the clay beds are situated several feet underground and require the removal of a considerable amount of material to be reached. The digging is usually done with the aid of agricultural implements, although in certain cases it is possible to procure the clay by mere hands. As the bulk is

being heaped beside the pit, "impurities" and undesirable particles are removed when they come to view, and the suitable clay is packed for transportation. Sacks,¹⁰ baskets, or boxes are used for this purpose. Two qualitatively different types of clay are utilized: (a) the so-called *pan* clay, often also referred to as "blue clay," which is a relatively dry and compact, coarse-textured variety, containing a natural admixture of sand and usually mica; (b) the so-called *pipe* clay, fine in texture, somewhat stiff, relatively moist, and wellnigh free of sand, yet often containing minute particles of mica. The two kinds are found in different beds, and in separate deposits, and in the raw state are always stored separately, either "dry" (in sacks, etc.) or wet (in buckets, etc., moistened with water). The pan or blue clay is most abundant in river bottoms and gullies, and appears to be sedimentary. The pipe clay, on the other hand, is most common in elevated locations, and appears to be residual. As shown by laboratory tests, the pan clay has an average linear shrinkage of 4 percent, and the pipe clay has an average shrinkage of 2 percent.

Chemical analyses reveal a high percentage of ferric contents in both the pipe clay and the pan (blue) clay. The actual percentages vary with individual locations. The several samples obtained by me and qualitatively analyzed have shown the following proportions of iron oxide:

Pan clay	Pipe clay
Sample 1: 11.92 percent	Sample 1: 8.83 percent
Sample 2: 10.40 percent	Sample 2: 9.35 percent
Sample 3: 11.67 percent	Sample 3: 10.04 percent

The high percentage of iron helps to explain the red-burning tendency of the two clays.

PREPARATION OF PASTE

The initial treatment in the preparation of the paste consists of pulverizing the clay by vigorous pounding with a cylindrical, double-headed wooden pestle, 0.85 m. to 1 m. long and about 0.08 m. to 0.12 m. in diameter (fig. 1*h*).¹¹ The raw material is crushed first, and then either sifted through a household sieve, or screened through a piece of window screen. This is done either upon a board foundation¹² or on some coarse textile, and facilitates the removal of objectionable matter which is exposed as the clay is

⁵ Harrington (1908*a*: 402) states: "Three mines of pan clay are known on and near the reservation, and five of the pipe clay." This number, however, does not express the potential sources in the locality.

⁶ Cf. Speck (1934: 71): "When you depart 'from digging clay' put some earth back in the hole to cover it."

⁷ Even in 1941, I was asked to remain in the car while a sample of pan clay was being obtained for me by a member of the reservation.

Cf. Harrington (1908*b*: 224) for the significant observation among the Eastern Cherokee: "After Ewi Katalsta had dug her clay from a bed on Soco creek, the exact location of which she did not seem inclined to reveal . . ."

⁸ Cf. Speck (1934: 71): "For a long time clay has been dug, now the hole is big . . .," *i. e.*, ready to be abandoned.

⁹ Harrington (1908*a*: 403); for an illustration of a small pit, see his plate XIX*a*.

¹⁰ Harrington (1908*a*: 403); Speck (1934: 70) specifies a bag.

¹¹ Cf. also Harrington (1908*a*: pl. XIX*b*).

¹² Harrington (1908*a*: 403 and pl. XIX*b*).

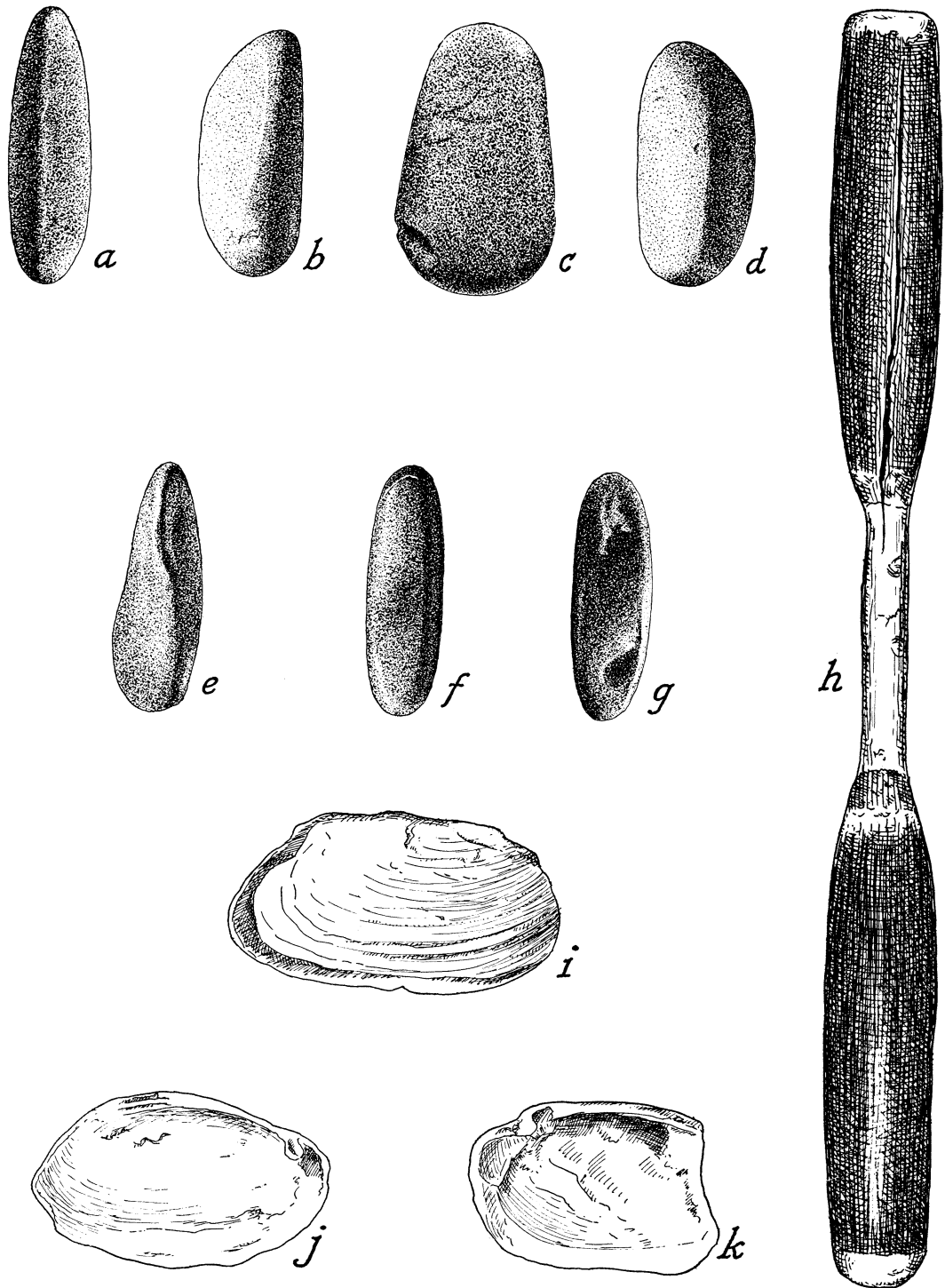


FIG. 1. *a-g*, polishing stones; *h*, wooden pestle for pulverizing clay; *i-k*, mussel-shell scrapers.

repeatedly spread and turned. The two types of clay are subjected to the pounding treatment individually.

For the manufacture of vessels a mixture of pan clay and pipe clay is used, the proportions being about half and half, or two thirds of pan and one third of pipe clay,¹³ while pipe clay alone is used in the production of pipes.¹⁴ The two clays are first combined by heavy pounding and by mixing; more mixing follows the addition of water which is applied after a satisfactory state of clay pounding has been reached. The raw material is not subjected to levigation,¹⁵ nor are any solid substances added to the paste. In fact, the pan clay is arbitrarily freed of its natural sand by sifting and picking.¹⁶ However, particles of mica, constituent to the clays, are allowed to remain; it would certainly be very difficult to remove them. Occasionally, blood of domestic animals is said to be added to the clay in mixing, after the customary amount of water has been applied; this, the natives hold, assures lightness

¹³ Harrington (1908a: 403) speaks of "about two parts of pan clay to one of pipe clay." Cf. also Holmes (1903: 53-54), where "about equal proportions" are recorded.

¹⁴ Pipe clay alone is said not to be usable in the manufacture of larger pieces, for experience shows that specimens so produced "always" crack when exposed to fire. Apparently the natives have no remedy for this peculiarity, which seems to lie in the constituent properties of the pipe clay. However, the combination of the two types of clay affords an excellent medium with which to build (and fire) a vessel to satisfaction. The product of pipe clay alone is always a small specimen and its firing, in comparison with the average vessel, requires less heat. It is interesting to note that pan clay is never used alone. While this is not explained by the natives, it seems evident that its texture is recognized as unsuitable unless altered by an admixture of the pipe clay. Asked to operate with mere pan clay, Mrs. Edith Brown declined, saying that vessels so produced "would not fire to satisfaction."

¹⁵ Even if the clay brought in from the pits is submerged in water while in storage, as is sometimes the case, the spontaneous "washing" which is started thereby is really negligible. So long as the potter's hands and tools are being moistened during the manufacture, a certain amount of levigated clay settles on the bottom of the receptacle. As a rule, however, this quantity is insufficient for practical application, and its fine quality is not considered an asset. In as much as the Catawba are not acquainted with the principle of the slip, this sediment is more or less wasted, unless it is eventually returned to the bulk of the stored raw material.

¹⁶ In certain archaeological sherds collected on the reservation, I noticed the presence of calcined particles of crushed bone. As far as I know, such a medium has not been observed among the historic Catawba. Dr. John R. Swanton (personal communication) has recorded the use of burned bone (and also of crushed sherds) for inclusions among the Natchez.

of weight in the final product.¹⁷ (Such blood is presumably highly coagulated and lumpy.)

Compacting of the paste is further advanced by hand kneading while the two clays are being mixed and water is being added. The preparation of the paste consisting exclusively of pipe clay undergoes a similar process. In either case the amount of admixed water is empirically governed by the degree of plasticity and consistency which the potter deems best for her purpose. There are no definite measurements, nor set standards, rather it is patent that the potter arrives at the desired state of satisfactory proportions more or less mechanically. Previous experience, quite obviously, is the determining guide. Upon the completion of the paste-producing procedure, the bulk is broken up into small lumps if manufacture of vessels follows immediately; otherwise it is stored away in larger quantities, usually bundled in cloth, to be drawn upon as needed. In the latter case, water may be occasionally added to replenish natural evaporation, but as a rule the paste is not stored long enough to necessitate this step. At any rate, old paste must always be re-kneaded to restore its pliability, and this inevitably requires additional water.

PROCESS OF MANUFACTURE

GENERAL PREPARATION

The potter operates either outside—generally on the open porch of the house, or under shade trees—or indoors, depending on weather conditions. Seasonal limitations, therefore, are rather insignificant. With the proper place selected, the necessary equipment and tools are assembled and placed within easy reach of the artisan, who works in a seated position. Of particular importance is a board used primarily for the preparation of fillets; this significant contrivance is here designated as the manipulating board. Some potters use yet another, smaller board, often called the "lap board," which is limited in function strictly to the purpose of supporting an embryonic piece in the building procedure, and in the shaping process. The essential tools comprise: a cane knife for cutting strips of paste and for general paring and trimming (fig. 2*g-h*); freshwater mussel-shell (fig. 1*i-k*) and gourd-rind

¹⁷ My attempts to secure a rational explanation for this reasoning from the potters were not successful. The practice was not demonstrated during my observations. The reference to the "lightness of weight" suggests that the admixture of blood clots adds an organic medium which in the firing process tends to increase the vessel's porosity.

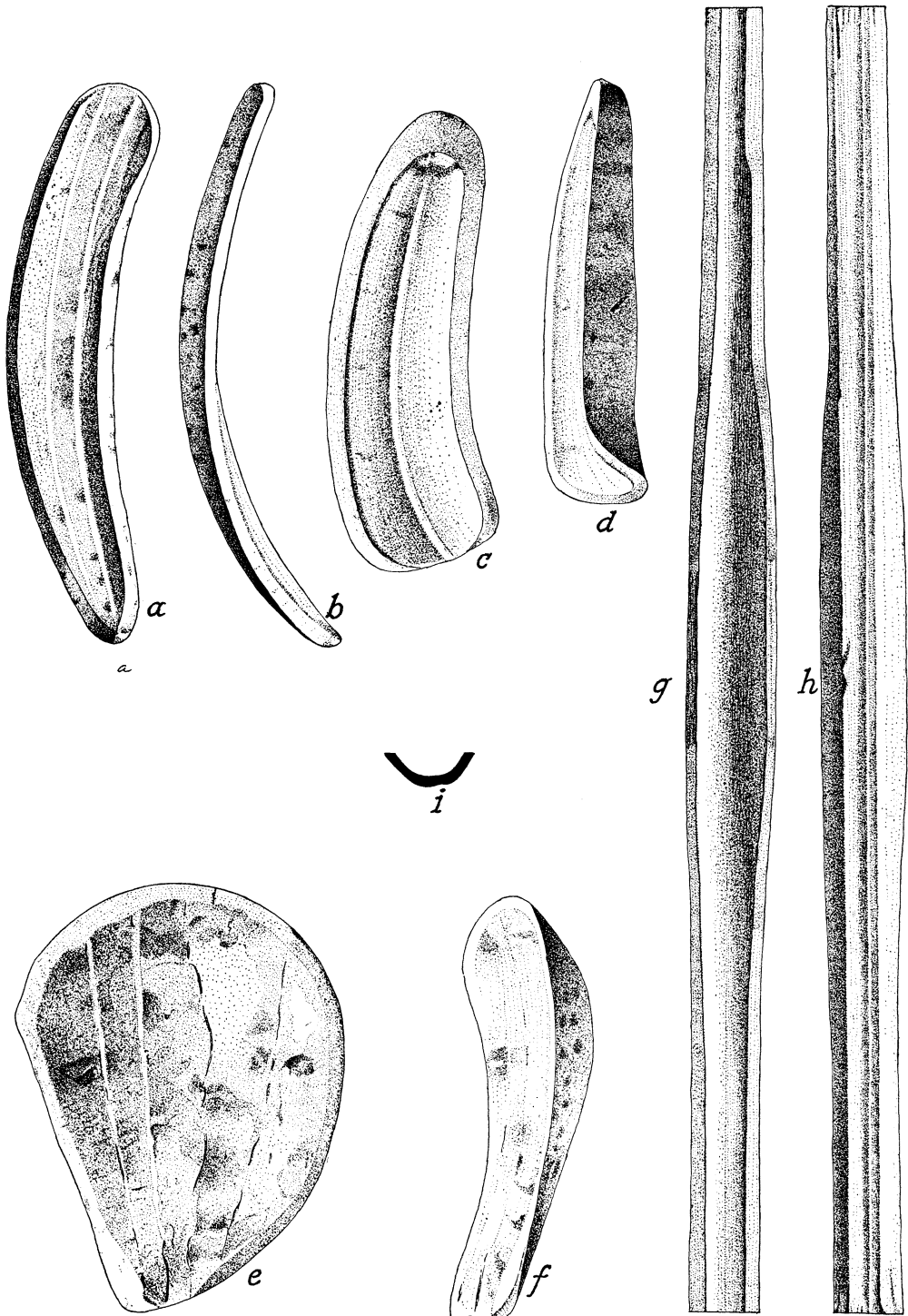


FIG. 2. *a-f*, three gourd-rind tools employed in form-giving; *g-h*, cane knife; *i*, cross-section of *g*.

scrapers (fig. 2a-f); polishing pebbles (fig. 1a-g).¹⁸ A supply of water, usually in a metal receptacle such as a tin can or a wash basin, is constantly maintained at the potter's side for moistening the paste and tools, as well as for washing hands.¹⁹

BUILDING TECHNIQUE

It is not always possible to segregate pottery-building technique (*i. e.*, the actual process of construction) from shaping (*i. e.*, that manipulation which results in form-giving). With the Catawba the two tasks are sometimes accomplished wholly separately and sometimes, consciously and unconsciously, concurrently. For this reason it is necessary, at the outset of the description of the relevant processes, to make due allowance for the often inseparable duality involved.

The Catawba employ the following three categories of construction: (1) modeling, or direct form-drawing, out of a lump of paste, not necessitating subsequent shaping; (2) segmental building, depending on two annular variants, in both of which individual fillets of paste are used; (3) molding within a double form, used exclusively for the manufacture of certain pipes and lugs. Two distinctly different modes of fillet construction are commonly practised on the reservation: (1) the uninterrupted process, which uses the ring or the circuit variant; (2) the sectional process, which depends largely on the circuit variant.

The three categories and their respective variants were known to all the potters whose pro-

¹⁸ Cf. also Harrington (1908a: pl. XXIIIa, b): shells; (c-e): shaping artifacts of gourd rind; (f): wooden implement, not explained by the author—perhaps a shaping or smoothing tool?; (g): iron knife, *i. e.*, one with a metal blade and a wooden handle; (h, i): cane implements, *i. e.*, both fashioned of splints; (h): apparently a knife; (i): perhaps a perforator?; (j): wooden perforator; (k-m): smoothing stones; (q-r): bone implements, evidently polishers, used in the manner shown on plate XXk. For polishing pebbles from Tidewater Virginia, cf. Speck (1925: fig. 106a, b): Mattaponi and (c-g): Pamunkey, shown in comparison with three Catawba specimens (j-l).

¹⁹ Dr. Speck supplied the following interesting belief which he recorded at the Cherokee reservation from the late Mrs. W. West Long: "If a woman engaged in pottery making touches or handles dead mice or rats, pollution follows and causes serious breakage during the firing process. In order to alleviate such consequences the woman must wash her hands on four successive mornings in water procured from the holes of red crawfish, *i. e.*, pure deep water." The Catawba, as far as I am aware, do not subscribe to this belief. Yet, according to Mrs. Sally Gordon, although not corroborated or substantiated by others, dead mice or rats should be interpreted by the potter as "a bad omen, if anything."

cedure I have observed. A detailed description follows.

Modeling

The modeling begins with a roughly spherical lump of paste, within which the potter first forms a grip depression to accommodate her thumb. The depression is worked into a cavity by pressing the fingers of one hand into the lump, and turning it with the other hand. Thereupon building and shaping progress simultaneously, both being the result of additional finger manipulation. The body of the vessel may be made either entirely in the potter's hands, or with some such support as a basal fragment of a broken vessel or a portion of gourd rind. It seems advisable to stress the purely non-form-giving function of such a support in order to preclude possible misunderstanding. The shape of the basal portion of the vessel under construction is not achieved by pressing the paste into the cavity of the supporting device. It is, of course, entirely possible to effect certain incidental shape conformity; however, the bottom has already been modeled when the support comes into use. The modeled specimens are usually of small size and simple in shape (figs. 3, 9).

The so-called "peace pipe," a Southeastern oddity,²⁰ consists of a globular bowl with four or more appended stem tubes (fig. 7a),²¹ and imi-

²⁰ Originally also in use among the Chitimacha; cf. Swanton (1911: 349).—Whether or not its Catawba occurrence is to be related to the stone or pottery "peace pipe" mentioned but, in so far as the pottery variety at least is concerned, inadequately described, by Timberlake (1765: 39), cannot yet be established.—An interesting specimen of steatite, having four perforations for stems, drilled at equal distances from one another, is known from a grave find in Philadelphia; cf. Barber (1878: 113). This, as far as I understand the distribution, seems to be the most northerly appearance, yet known, of the type of pipe which accommodated four smokers at a time.—The Pamunkey probably borrowed the four-stemmed pottery variety from the Catawba; cf. Speck (1925: 427 ff.).—Speck (1925: 432) contends "the 'peace pipe' was a native Southeastern object." This view finds some support in certain scanty, yet suggestive archaeological evidence from the territory of the contemporary Catawba. Fragments of bowls and stems of such "peace pipes," collected during our stay at the reservation in ploughed fields, tend to endorse the deduction first advanced by Speck. However, the locality in question did not yield adequate evidence with which to establish, even provisionally, whether or not a definite archaeological site exists there. Moreover, the material may well be of modern Catawba manufacture, or in any case historic.

²¹ For a six-stemmed, four-footed specimen, cf. Holmes (1903: pl. CXXXVIII, lower row, center); the teatlike feet, of which three can be seen in the illustration, have the

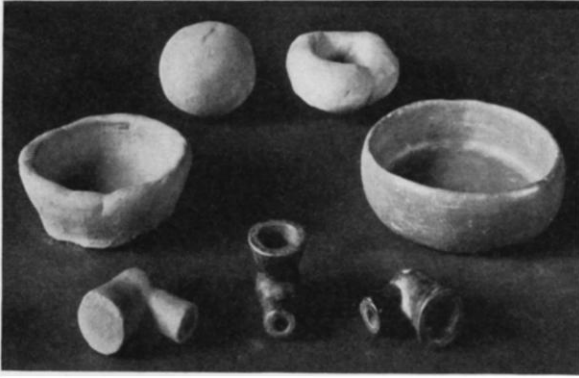


FIG. 3. Construction of a modeled Catawba bowl from the initial lump of clay to the finished product. The stem and bowl of the pipe were carved out of a molded blank.

tates the shape of a spear head. This and sometimes the plain pipe (fig. 7b),²² as well as miniature vessels, are produced by hand modeling. Similarly, bottoms of vessels, irrespective of size or form, are modeled in hands; they are first patted in the palms, then flattened into a discoidal shape, and finally neatly rounded (fig. 5).

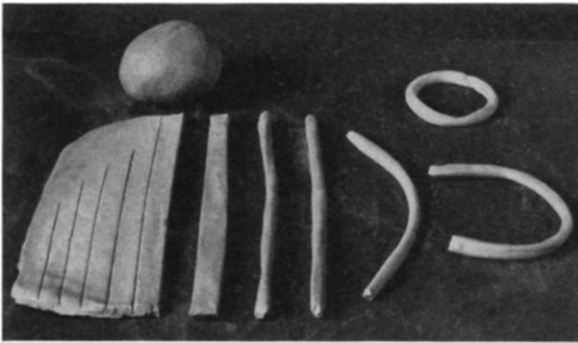


FIG. 4. Procedure followed in the fashioning of a single "ring" from the original lump of paste.

The technique of modeling complete vessels is a very simple process in which the fingers of the operator are the sole means of building and shaping the form, thinning the wall as it is being

shape of a truncated cone; the four tubes in full view have a cylindrical form; the grooved decoration presents a linear design placed on the bowl (cross hatching, running chevron, and myrtle twig) and on the stems (four parallel grooves on each one of the visible four); a pronounced surface lustre is clearly in evidence. The specimen was collected either between 1876 and 1886 or later (Holmes, 1903: 143), *i. e.*, possibly, *by inference*, as late as 1903, the date of Holmes' publication.

²² For illustrations of certain phases of pipe-making by modeling, *cf.* Harrington (1908a: pl. XXIIa-d).

drawn out, and finishing the surfaces. Naturally, this requires rather scanty attention at the end of the shaping, for the potter's fingers have automatically smoothed the wall concurrently with its growth. There is also a minimum of scraping, if, indeed, any significant roughness does occur.

Only polishing, if desired, is finally done with the aid of specialized tools, such as a pebble, bone, or cane implement, or the specimen may be treated with a wet cloth to attain smoothness. Beginners, as a rule, are instructed first in the modeling method which is, quite naturally, considered the simplest.

Segmental Building

I have chosen this expression as a substitute for the *general* term "coiling." Its collective connotation includes *coiling proper* or that process of pottery-building in which the paste medium, either a single fillet or a series of successively joined fillets, linked as the potter proceeds, is wound spirally. (*Cf.* the section on "Coiling," *infra*.) It also includes the Catawba practices here called the ring and the circuit variants, either of which these potters employ in two distinctly different building progressions. The two modes of construction are here labeled, respectively, the uninterrupted process and the sectional process. Since a decision as to which of the two methods to be followed is necessarily determined by the potter in advance of the construction, it seems imperative to classify the fillet processes first of all in recognition of this principle. The headings of the description which now follows are, therefore, arranged accordingly.

THE UNINTERRUPTED PROCESS—

Strictly speaking, this process concerns only the erection of the wall, for irrespective of the variant followed by the potter (either ring or circuit), the bottom is always prepared first by hand modeling (fig. 5).

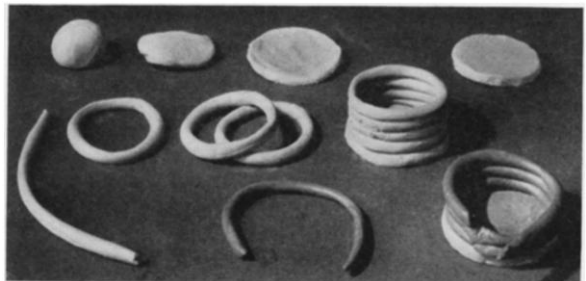


FIG. 5. Steps in the construction of vessels by both the ring and the circuit methods.

The ring variant.—The ring method consists of the superposition of several individual rings of more or less constant dimensions, each first separately fashioned and fully closed on the manipulating board. The construction of a prospective vessel begins with the modeling of the bottom, from a suitable piece of paste, in the potter's hands. The disk-shaped piece is placed on the supporting board with an impact which immediately flattens its underside. The board²³ usually has a coating of old, dry paste so that moistening to prevent adhesion of the disk is not always necessary. If the force of the impact causes distortion to the shape or to the margins of the disk, the potter carefully rectifies this and then proceeds to build the wall.

The preparation of the rings themselves involves the following manipulation. First, cylindrical fillets of paste, fairly uniform in length, are fashioned either beforehand, or as the process advances; as a rule, the manipulating board is utilized for this need. To prepare a fillet, a ribbon is cut, with a cane knife,²⁴ from a strip of paste which was first flattened out of a lump. The ribbons are then either rolled out on one of the boards, or manipulated between the palms while hanging pendant; thus the fillets acquire fairly uniform thickness and length, both of which are determined by the dimensions of the desired vessel. The fillets are closed into rings on the board prior to their entry into the building process proper; their diameters are more or less equal in each individual cylindrical blank. The ends of the fillet are somewhat thinned and flattened to prevent increase in the girth of the overlap, and any surplus paste is removed.

The initial ring is placed upon the previously flattened disk-base in such manner that it rests close to the horizontal edge thereof; the ring is then pressed down as soon as its outward margin coincides with the planed circumference of the embryo bottom. Subsequent rings are superimposed one by one, concentrically, and each is individually pressed down vertically, until the preconceived height is attained. The joints of the rings are usually well aligned in order to "aid in the shaping process which follows later"; at least so the potters explain this seemingly irrational peculiarity.

The potter achieves satisfactory bonding of each individual ring by pressing, pinching, and

smoothing its surface with her fingers. Viewed in cross section, the traces of such bonding are parallel and reveal symmetrically overhanging spreads on either side of the underlying ring.²⁵ Either a slightly convex or a slightly concave curvature, or possibly an irregular flattening, is discernible in the profile of the zone marking the contact between the initial ring and the base. The overhanging then appears only on the outward side where the potter had pushed some of the ring's paste over the edge of the basal disk.

Throughout the bonding procedure, the artisan operates up and down the growing wall. Traces of the junctions are, of course, at least partially mutilated by the subsequent shaping and scraping processes. Nevertheless, a cross-section of the fired product often enables the observer to distinguish several criteria of the constructional technique. The ring joints, for example, are often visible through marks retained within the span of the overlap; individual rings are at times recognizable, and so are also their marginal overhangs (fig. 10). Sometimes a chip on a fired specimen exposes certain technical details. Dissection of a vessel still in the plastic state usually reveals ample evidence of the building process employed, despite the distortion occasioned by the scraping and form-shaping steps.

The circuit variant.—The circuit variant involves the use of strips of paste, rolled into fillets on the manipulating board, and fairly uniform in length. The following lengths of rolls have been observed: by Palmer, 12 inches or less;²⁶ by Mooney, 8–10 inches;²⁷ and by myself, 8–16 inches (0.203 m.–0.406 m.). It is to be remembered that unless sectional building is necessary, the potter usually produces first a cylindrical blank which is subsequently shaped into a final form. For the annular construction, therefore, the length of paste rolls, whether intended for rings or circuits, must be rather constant. Naturally, occasional deviations can be easily rectified.

The building proper again begins with the formation of the bottom. The first fillet is applied in a manner similar to the placement of the initial ring, but the completion of the circuit occurs on the growing embryo. A right-handed potter²⁸ proceeds in a clockwise direction. She holds the

²⁵ Cf. Holmes (1903: fig. 30f, c) for an analogous, schematic illustration.

²⁶ Cf. Holmes (1903: 55).

²⁷ Cf. Holmes (1903: 54).

²⁸ All the Catawba potters observed by me were right-handed.

²³ First recorded among the Catawba, as far as sources show, by Dr. E. Palmer in 1884; cf. Holmes (1903: 55).

²⁴ A metal knife is sometimes substituted.

fillet in the right hand, adjusts its placement and contact with the left, and also turns the bottom, this time counterclockwise, with the left hand. The fillet is somewhat flattened as it is pressed down and bonded. Its ends meet at the completion of the circuit, having been trimmed by finger pinching as the last step preceding their joining.²⁹ Excess paste is broken off; should there be a shortage, the potter either removes and re-shapes the fillet, or, if the deficiency is negligible, adds the necessary amount of material. Subsequent building proceeds by superposition of individual fillets; their placement, bonding, and alignment are accomplished in a similar manner as in the case of the rings. In reality the ring and circuit variants are functionally identical. In the one the ring is closed and then applied as a part of the wall-erecting process, whereas in the other this operation is reversed (figs. 5, 6).



FIG. 6. The procedure followed in the construction of a Catawba vessel from the superimposed rings of paste at the left to the polished and fired bowl at the right.

During the building manipulation the hands of the potter are frequently washed in water, whereby they are not only kept free of paste, but also in condition to facilitate bonding and removal of surplus material. By the time the desired height is reached, the crude product, fully plastic, usually has a cylindrical form, distorted here and there owing to the frequent turns and patting by the operator. The fillets become planed on all sides soon after joining, yet they remain individually recognizable despite the frequently repeated hand smoothing. With the placement and bonding of the terminal ring or circuit, the annular process completes the erection of the wall.

²⁹ Cf. Holmes (1903: 54) (Mooney's observation): a roll "properly flattened out was carried around its [the disk's] circumference and broken off on completing the circuit"; and p. 55 (Palmer's observation): "One of these [rolls] is wrapped about the margin of the disk and worked down and welded with the fingers, and others are added in like manner until the walls rise to the desired height." Harrington (1908a: 403) speaks of "coiling" individual rolls one by one—in reality the circuit method.

Then follows shaping of the form.³⁰ Employing a spoon-shaped piece of gourd rind (fig. 2e-f) on the inside of the cylinder, and her free hand on the outside, the potter gently forces out a definite form, progressing, as a rule, upward from the bottom.³¹ Superficial traces of the fillets are more or less completely obliterated by this operation. However, individual demarcations of their adhesions are retained inwardly; this is so because the pressure exerted by the potter upon each ring or circuit registers a lessened effect within the wall.³² (Penetration of tools into the interior of the wall is entirely out of the question. During the placement and bonding of the individual rings or circuits only the fingers are employed.) Throughout the shaping process the tools as well as the hands are frequently submerged in water. In the removal of excess paste the potter utilizes a cane knife. When finished, the definitely formed vessel has a smooth appearance both inside and outside. The wall is now thinner, but there still remains a superfluous quantity of paste smeared over the body. The next step, therefore, involves a scraping process³³ whereby this excess is removed with the aid of a mussel shell,³⁴ which is also frequently dipped in water. As a rule the scraping is done on the outer surface first, because in the case of defects limited re-shaping becomes necessary and its execution is effected by operating largely within the interior of the specimen. The scraping completes the shaping process, and at the same time prepares the vessel for its final surface finish, namely smoothing and polishing. The mussel shell also serves to cut and smooth the rim, for the lip form of which a provision is made as the final fillet is bonded and partially drawn out or perhaps everted. Vessels with a plain, undiverted rim,

³⁰ Although the description of this process should perhaps be reserved until the molding method has been presented, its inclusion at this point is motivated by a desire to retain continuity.

³¹ The Catawba do not use a trowel or anvil, of either pottery or other material. As far as I am aware, there are no suggestions or positive evidence to show that either contrivance was known to their predecessors. The pottery trowel, as found archaeologically in the Middle Mississippi Valley area (Holmes, 1903: 35-36, figs. 6, 7 (diagrammatic depiction of a method of use), and pls. XXXV, XXXVI), is paralleled in Tennessee, *presumably* amid Cherokee remains; cf. Harrington (1922: 194, fig. 33).

³² Tests on plastic as well as on fired (fresh and old) material clearly illustrate this point.

³³ This step, no longer a part of the building process, is inserted here for the retention of continuity.

³⁴ A piece of gourd rind, similar to the usual shaping tool, but with sharpened edges, is sometimes substituted.

or entirely without a lip, are terminated at the mouth by hand pressing or by pebble polishing. No drying is necessary before scraping begins, for this step has the function of reducing and smoothing the wall, as well as further increasing the total compactness. The state of complete plasticity, therefore, facilitates this treatment most advantageously.³⁵

THE SECTIONAL PROCESS—

Vessels of large proportions and severe curvatures are produced by sectional building and subsequent joining. The component sections of such specimens, *i. e.*, the base with a lower portion of the belly, the shoulder with an upper portion of the belly, and the neck, are separately erected usually by the circuit, rarely by the ring, variant of building. These parts are individually shaped and scraped, and then joined. To effect their complete bonding, the potter works with a gourd rind tool wherever the hand fails to reach. It is thus possible to manufacture a great variety of body shapes.³⁶

Molding within a Double Form

The mold is made of paste comprising equal parts of the two clays used in the manufacture of vessels. The molds are now rather rare on the reservation. Those still to be found were mostly inherited, and the younger people do not seem to be very skillful in producing new specimens.

Harrington (1908a: 405-406) recorded the following process of manufacture: "For making pipe molds an original model is shaped by hand, and after being burned in the usual way is greased and forced down into a flattened cake of fresh clay until half embedded, then the surface of the cake is also greased to prevent sticking, and another cake laid over and pressed down, forming a complete form of the original pipe. When dry these half molds are removed and burned, then

³⁵ For illustration of various manufacturing steps employed by the Catawba in 1908, *cf.* Harrington (1908a: pl. XIXc), "roll shaping"; (d), "application of initial roll"; (e), "application of roll in later stage of building," *i. e.*, the circuit process, by Harrington, however, labeled as "coiling"; and (f), "blending of individual rolls," *i. e.*, superficial bonding of the fillet circuits; and (XXg), "rim shaping"; (h), "rim smoothing"; (i), "scraping of outer surface"—in the instance shown, done by a male operator; (j), "rubbing with a pebble"; (k), "rubbing with a bone implement."

³⁶ The sectional process has not been recorded in hitherto published sources on Catawba pottery.

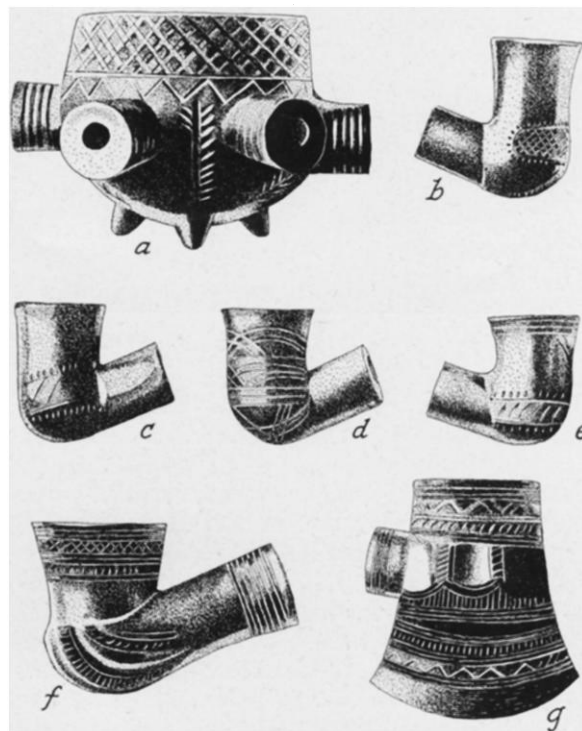


FIG. 7. Catawba pipes illustrating decorative styles: a, "peace" pipe; b-f, smoking pipes; g, pipe in form of axe.

they are ready for use."³⁷ Harrington is to be credited with the first record of the Catawba pipe mold manufacture. It may be added that some molds have pyrenoid protuberances fitting into corresponding depressions to aid in retaining the position of the tightly closed double form. Other molds have orifices bored through their corners to

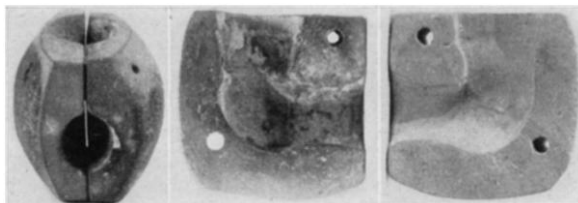


FIG. 8. Catawba pipe mold. (Courtesy Peabody Museum, Harvard University.)

serve a similar purpose by the insertion of wooden sticks³⁸ (figs. 8, 11e-f).

³⁷ For illustrations of pipe molds, *cf.* Harrington (1908a: pl. XXIII n, o, p): single half and two halves of the same mold—Indian head form.

³⁸ *Cf.* also Harrington (1908a: pl. XXIII o, p).



FIG. 9. Various types of smaller Catawba pottery pieces, constructed for the most part by modeling.

The molds are now frequently borrowed from house to house. All varieties of pipe shapes, with the exception of the "peace" and the spear-head types, are usually molded, although the plain form is frequently hand modeled. The actual technique of molding may be described as follows. A rough shape, approximating the cavity of the form, is modeled by hand, and pressed into the mold in which it is enclosed as much as the bulk will allow. The excess paste oozes out between the incompletely closed halves of the form, is removed, and the pressure is renewed. The process is repeated until the mold is tightly closed. In the meantime the paste blank is fre-

quently extricated and scraped, and inserted again until it assumes the final conforming shape. When satisfactory form is attained, the specimen requires only drying to be ready for surface treatment, for the piercing of the stem, and for the carving out of the tobacco bowl (unless it is to be used as a lug, which is often the case with the Indian head type) (figs. 13, 14).

Harrington (1908a: 405) speaks of coating the cavities of a pipe mold with grease or ashes "to prevent sticking"; such procedure was not noted

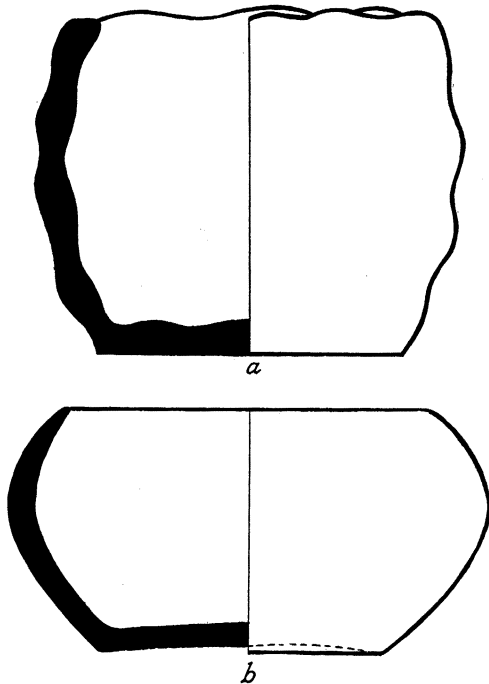


FIG. 10. Cross-sections of Catawba pots, indicating wall thickness and contour.

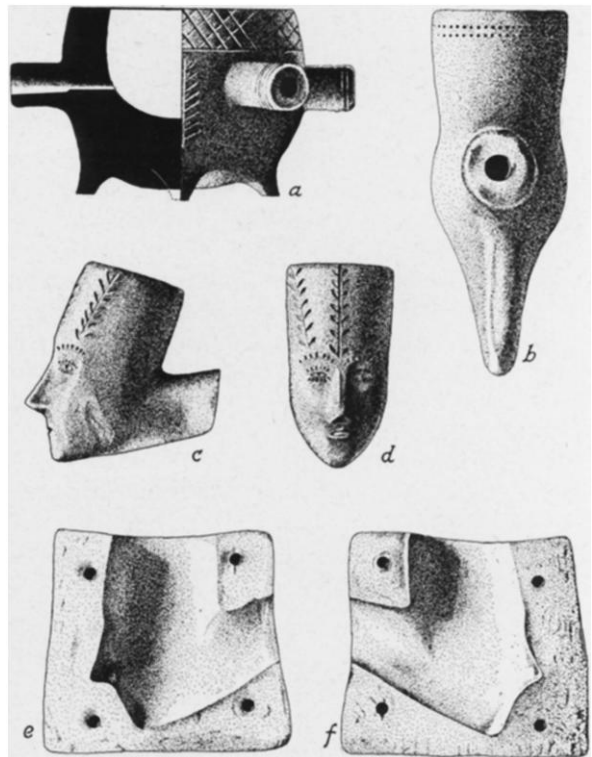


FIG. 11. *a*, "peace" pipe in section; *b*, pipe in form of spear; *c-d*, pipe in form of Indian head with stylized feather bonnet; *e-f*, pipe mold.



FIG. 12. Vases exemplifying the mottled effects achieved by the Catawba in firing: *a*, plain handles; *b*, unadorned cylindrical vase; *c*, flared lip; *d*, lugs in the shape of Indian heads.

by me, yet the potters did not seem to experience any difficulties in the alternately repeated insertion and removal of the plastic blank.

FORMS

The pottery forms of the contemporary Catawba seem to be determined by local as well as by external factors; the former are governed by tradition and the latter by economic forces. The bulk of the product is absorbed through commercial channels and is sold to the ultimate user chiefly through an intermediary. The market and its demand unquestionably exert certain influences on the form, and have done so, apparently, for some fifty or sixty years.³⁹ Thus candlesticks, book-ends, ashtrays, and various grotesque forms now so commonly produced, are concretely illustrative of this force. Nevertheless, purely native strains still dominate the craft. After all, the market is interested in this ware because it is Indian. The basically old globular and semiglobular forms are retained, protean

³⁹ Cf. Holmes (1903: 143); Speck (1934: 70).

tendencies are nominal, and above all the technique of manufacture remains wholly aboriginal (fig. 12). The guiding criteria which enable the student of Catawba culture history to affiliate their ancient ware with the modern product rest first of all upon the phenomena of technique. Although archaic forms are giving way to shapes dictated by the marketability of the product, the continuity of aboriginal methods is paramount. The peculiar process of fillet-building by the ring method appears to be decidedly endemic. However perverted the forms may now appear, their manufacture plainly documents an unmistakable uniformity in qualitative properties, building manipulation, surface treatment, and firing, all of which preserve elements recognizable in early historic Catawba pottery.

The contemporary forms may be classified into two groups:

(1) Endemically inspired similes of older examples, governed by traditional survivals,⁴⁰ in which globular and broad-bodied open jars, semiglobular bowls, conical bowls of low height, casserolelike vessels, each with a flat bottom, are

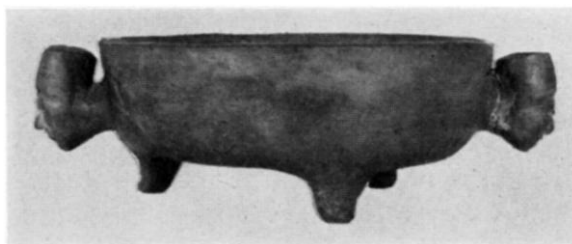


FIG. 13. Catawba vessel with plain lip and handles in the form of unadorned Indian heads. (Courtesy of Peabody Museum, Harvard University.)

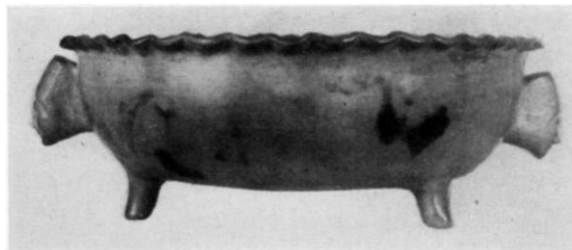


FIG. 14. Catawba vessel with flared indented lip and Indian head handles depicting feathered bonnet. (Courtesy of Peabody Museum, Harvard University.)

⁴⁰ And up to the late eighties, apparently, perhaps also by actually retained ancient specimens, such as were then collected for the U. S. National Museum; cf. Holmes (1903: 143).

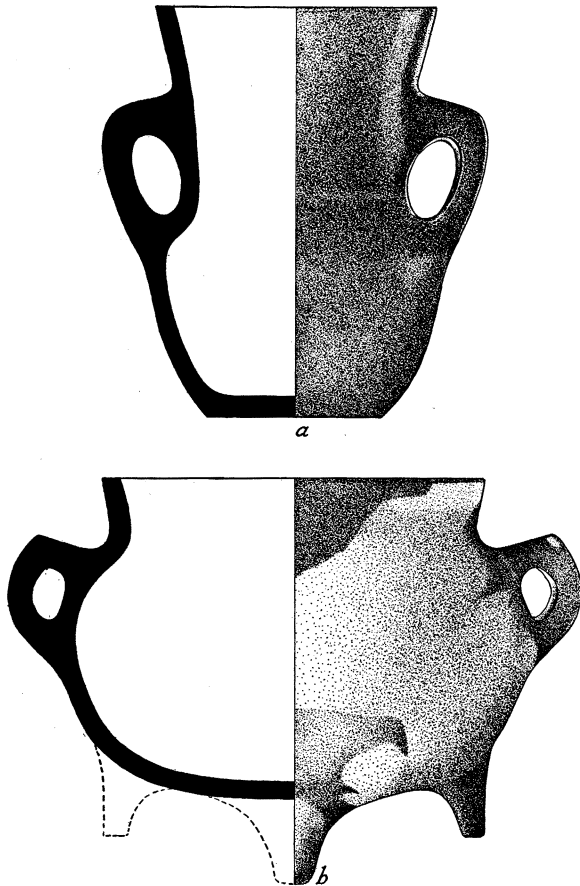


FIG. 15. Cross-sections of Catawba pots indicating thickness of walls.

common (figs. 11–17).⁴¹ The jar sometimes has three or four teatlike pedestals, in which case the bottom is usually rounded (figs. 11, 13, 14).⁴² There is no dependable archaeological evidence with which to consider the likely antiquity of this form. The drum possibility is perhaps to be held in abeyance; on the other hand, the shape may well have been derived from the European metal kettle or cauldron.

⁴¹ The flat bottom seems to be an old characteristic in Catawba pottery; cf. Holmes (1903: 143). However, Harrington (1908a: 407) considered the flat bottom a sign of the modern product only, a view which, I think, requires revision. The flat bottom is characteristic of all pottery reasonably ascribable to pre-contact or early historic Catawba.

⁴² For illustrations of this type, cf. Holmes (1903: pl. CXXVIIb, rear row, first from the left), *i. e.*, a modern “Cherokee” piece (*vide also ibid.*: fig. 4, depicting a three-footed vessel converted into a drum); and further Harrington (1908a: pl. XXIIIc). For Pamunkey similarities, cf. Holmes (1903: pl. CXXXVI, 1 and 3, counting from the left) and Speck (1925: fig. 114).

(2) Forms inspired or demanded by commercial opportunities, among which practically any shape may now be found (figs. 7, 9–11, 13–15). Again, the flat bottom is typically constant, and scalloped rims seem to be favored. The canoe shape may possibly be a modified survival of an elongated bowl; however, it may equally well have been developed in post-European contacts. Such pieces as ashtrays, book ends (figs. 20, 21), wall vases, and various other non-native forms must have been adopted by the Catawba, either directly or indirectly, since colonial days. Whether or not the pottery terminal of the syringe-insert⁴³ is aboriginal, is open to question.

The tobacco pipes include the most commonly made form with a plain bowl, the rim of which may, at times, be drawn out into a mildly flaring lip (fig. 22a); the rooster-comb shape (fig. 23a), in which the appendage may be either pronounced or moderate; the boot type (fig. 23d); the Indian head with a stylized depiction of a feather bonnet



FIG. 16. Catawba vessel in old native inspired form.

⁴³ Speck (1934: 51, note 1).



FIG. 17. Catawba vessel in old native inspired form.

(fig. 11*c, d*); the spear (fig. 23*c*); the axe (fig. 22*c*); and the so-called "peace pipe" (fig. 7*a*).⁴⁴ Of these various types of pipes, only the plain pipe has close form analogies among archaeological finds in the Southeast.

Such vessels as are still in active use on the reservation perform the function of general receptacles, storage facilities, and, in a decidedly limited degree, culinary utensils. In 1929 only Mrs. Sally Gordon preferred pottery vessels (of her own make) to metal receptacles. She found them, as she explained, "more satisfactory in general, and much easier to keep clean." The

⁴⁴ Illustrations of modern Catawba pottery will be found in Holmes (1903: pl. CXXVII*a*), showing "vessels collected between the years 1876 and 1886" (*ibid.*: 143), of which only the pitcher (rear, center) is not a representative of the otherwise truly native forms, and (pl. CXXVIII) pipes "of the same or a later period" (*ibid.*) including plain shapes and the "peace pipe," which is thus dated as being manufactured at Catawba prior to 1903 (*i. e.*, the publication date of Holmes' report). Also in Harrington (1908*a*: pl. XXIII (lower) *a-j*), of which only *b* and *c* may be considered as being due to European inspirations, while *a* and *d-j* represent the common native shapes. The boot-shaped pipe from Pamunkey, illustrated by Speck (1925: fig. 123, lower, extreme right), has a typical Catawba form, and was likely either made by a Catawba potter or copied after a Catawba sample; *vide* Speck (1925: 414 ff.). Speck (1925: fig. 125*d*) shows a Catawba pipe of the Indian head type, apparently a molded specimen, in comparison with Pamunkey imitations (*e* and *f*), both produced by hand modeling.

usefulness of native vessels as catch-alls was amply demonstrated in all the dwellings which I visited; both damaged and intact vessels were employed for such purposes.

Of the pipes, the plain type, in the short tube of which a stem of cane is inserted, is generally smoked.

According to Speck (1939: 50), "the older [Catawba] informants . . . all remembered something definitely of the pot water-drum . . . constructed of an ordinary clay pot of the Catawba ware of medium size over the mouth of which a piece of wet rawhide . . . was stretched and bound below the rim of the pot by a thong or cord wrapping."⁴⁵

"In regard to the existence of burial mounds as recalled in the tradition of the oldest [Catawba] Indians questioned," writes Speck (1939: 45), "it may be noted that nothing has been brought to light. And the interment of pottery with the deceased is known to the present Indians only through pottery jars, of the types resembling those which they still produce, being found occasionally in graves washed out or invaded in the reservation cemetery." This observation is to be kept in abeyance for future archaeological work in the Catawba area.

Catawba pots vary in size from miniature vessels to pieces with a capacity of several liters. Wall thickness depends on form and dimensions; on the whole, 0.01 m. represents a fair average. (Book ends are often 0.02 m. to 0.03 m. thick.) Open bowls measure as much as 0.5 m. in mouth diameter, while their bottom diameter equals about two-thirds or less of that measurement.

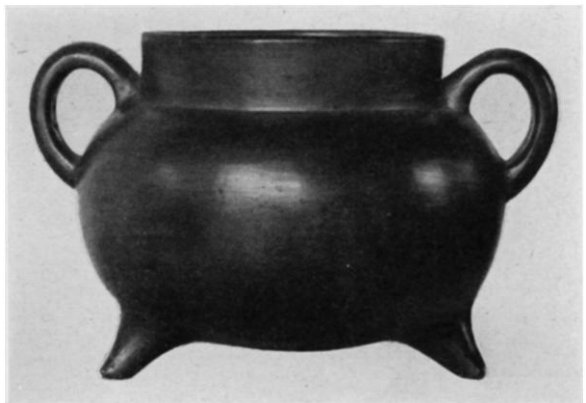


FIG. 18. A particularly handsome three-legged Catawba pot.

⁴⁵ Cf. also Speck's figures 1 and 2, illustrating improvised pot drums.



FIG. 19. Unadorned Catawba vessel with everted, flared rim.

Many jars reach a height of 0.4 m.; a very few, even 0.5 m. or 0.6 m. In Speck's *Texts* (1934: 71) a traditional recollection of "large milk pots" is recorded; these are no longer made, and their size remains conjectural. As far as I know, archaeological material of presumed Catawba manufacture does not reveal dependable data with respect to the sizes of the ancient ware.

SURFACE FINISH

The final surface treatment, executed while the specimen is still in its plastic state, consists of smoothing with a moist rag and polishing with a cloth or with a pebble⁴⁵ (fig. 25), unless decorat-

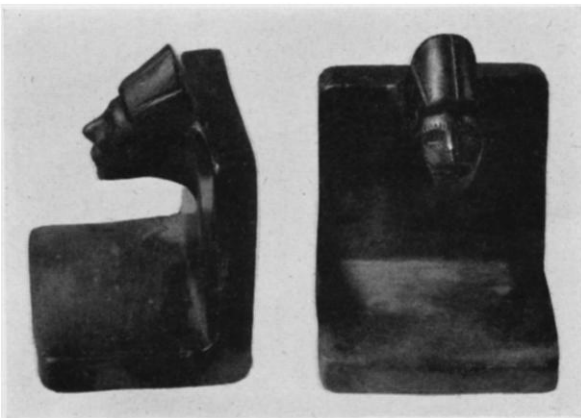


FIG. 20. Catawba book-ends.

⁴⁶ This involves mechanical pressure, and the resulting friction always leads to accelerated compacting of the surface so treated, which increases luminacy and, upon firing, leads to a lustrous effect.—The rag is of coarse material, such as burlap, while the cloth is invariably a piece of some soft cotton goods.

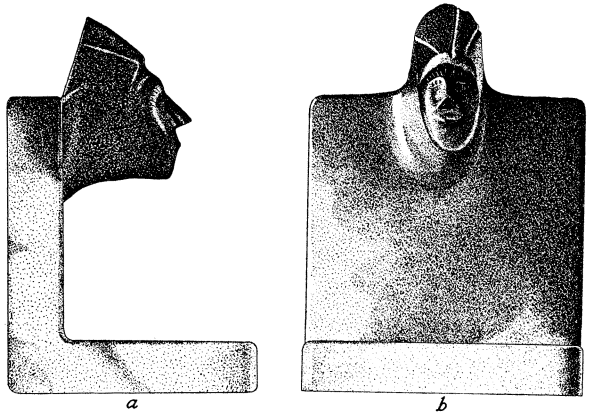


FIG. 21. Book-ends with Indian heads in relief.

ing takes place. However, the Catawba usually omit embellishment of vessels.

The rag smoothing is usually applied to the outer surface alone. A piece of old sack is commonly used for the purpose; excess paste is removed, cracks and defects are obliterated, and evenness of wall is attained. The chief function is to prepare the piece for the polish.

The polishing is executed over a moistened surface with the aid of a worn, smooth pebble

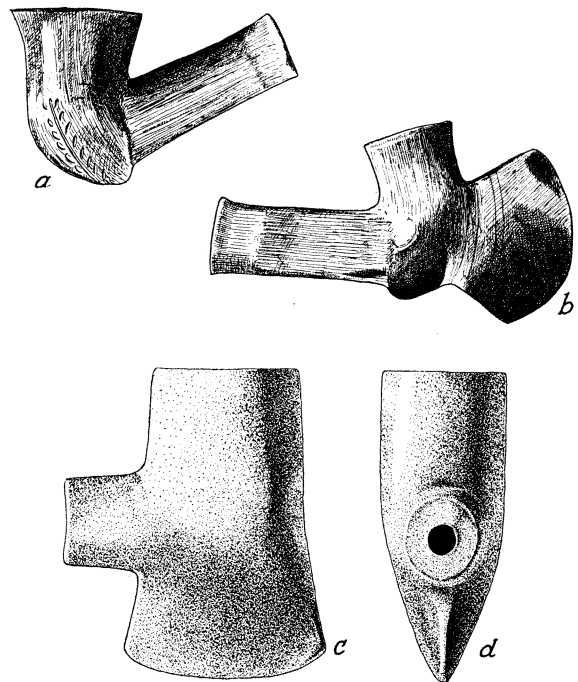


FIG. 22. Catawba pipes: *a*, plain with slightly flaring lip; *b*, molded in the war-club shape; *c-d*, in the shape of an axe.

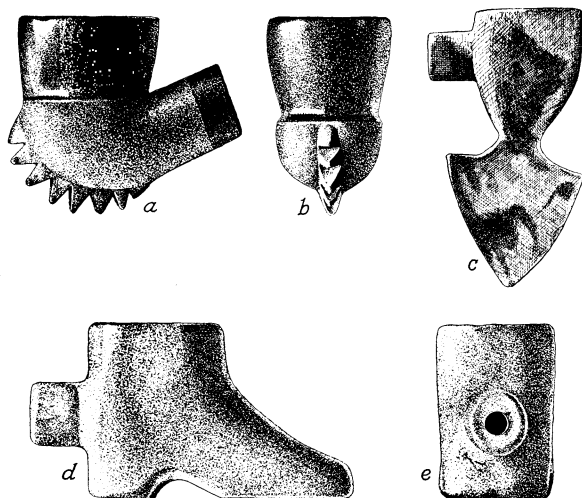


FIG. 23. Catawba pipes, molded in the form of a rooster's comb (a-b), a spear (c), and a boot (d-e).

(figs. 1a-g, 25, 26), a bone tool made of a rib or of a shank splinter (fig. 26), or a stick of hardwood stripped of its bark.⁴⁷ A piece of cloth, or of a soft skin, vigorously applied over a thoroughly moistened surface, will produce a polish comparable, in compactness and lustre, to one attained by the tools just stipulated. However, the cloth and the skin leave very inconspicuous identification stroke marks as against the typical pronounced facets of the stone, bone, or wood tools.

The polishing pebbles are regarded as somewhat of a precious possession and are retained in



FIG. 24. Catawba potter employing ordinary kitchen knife as scraper.

⁴⁷ The metal handle of a table knife is sometimes substituted with equally effective results.—Cf. Harrington (1908a: pl. XXIIIg, r, and pl. XXII, 1) for illustrations of bone polishers; and his pl. XXIIIk-m, for illustrations of polishing pebbles.



FIG. 25. Catawba potter using a polishing stone. Note bone scraper lying beneath right hand.

a family often for several generations.⁴⁸ They are ovoid, elongated quartzitic pebbles, blunt at either end, and with one or more working facets. The direction of the smoothing stroke depends upon the size and shape of the vessel under treatment; vertical and horizontal movements are most common. Generally the process is restricted to the outside surface and to a limited zone below the rim on the inside. Viewed in cross-section immediately after execution, the smoothed margin stands out in distinct contrast to the rest of the wall. A smoothed area is distinguishable through an accelerated textural density in the paste so affected. A similar difference is likewise discernible in the cross-section of the fired product. The textural difference, of course, is then especially prominently brought out by the heat. In extreme cases this phenomenon simulates a slip, which, in the true sense, is completely unknown in contemporary Catawba pottery, and, as far as can be ascertained at the present, is also absent in the ancient ware.⁴⁹

⁴⁸ Cf. the statement in Holmes (1903: 55) that Catawba women married and living at Cherokee had brought smoothing pebbles with them from their homes, and (p. 56) that such a stone was in use by a Cherokee potter's family for three generations. Cf. also Du Pratz (1758, 2: 179) regarding the careful preservation of smoothing pebbles among the potters of Louisiana. For a Pueblo analogy, cf. Guthe (1925: 28); for South America, Linné (1925: 107). Smoothing pebbles, with unmistakable facets documenting their original use, are known from sites around the Catawba reservation.

⁴⁹ In old Catawba pottery, polishing frequently appears on the interior which, in contrast to modern pieces, is often quite dark. The possibility is to be considered that the Catawba originally may have "smoked" the interior of



FIG. 26. Catawba potter smoothing interior of vessel just below the lip. Bone scraper and polishing stone in foreground.

Pebble polishing is a particularly constant feature in the treatment of pipes, which are given a highly lustrous finish; temporarily "lost" in firing, *i. e.*, subdued by a carbon film, such lustre is easily reinstated by wiping the cool specimen with a dry cloth.

DECORATION

While Catawba vessels are predominantly unembellished, smoking pipes are very often decorated by rather simple incising, grooving, fluting, and impressing. The patterns are geometrical, combining rectilinear and to a lesser degree also curvilinear lines in the case of the incised, grooved, and fluted techniques. The impressed variety is attained by rocking or rolling a corn cob over the surface. Another effect is sometimes produced by rubbing the vessel with a corn cob which is firmly gripped in the operator's hand. While modern means, such as the milled edge of a coin, a hair pin or a shoe-button hook, a piece of wire, etc., are frequently called upon, native tools, *e. g.*, the mussel shell, gourd rind, and cane knife, nevertheless preserve their importance. In all cases the embellishment is executed while the specimen is still in a plastic state, after the polishing, and usually upon a moistened surface⁵⁰ (figs. 7, 11, 22, 23).

vessels in a manner perhaps comparable to that described for the modern Cherokee by Harrington (1908b: 226); *i. e.*, by smudging the interior with a slow fire of corn cobs.

⁵⁰ Harrington (1908a: pl. XXe) shows a photograph of a potter engaged in decorating a vessel which, however,

Among the designs given the pipes, floral motifs, expressing single or multiple petals, leaves, etc.; curvilinear combinations, such as cartouche, arches, undulating lines, etc.; and rectilinear figures, forming herringbone or myrtle twig simulations, zig-zags, chevrons, diamonds, rectangles, etc., are common. Single lines or multiple parallel lines are frequent, and bands defined by two lines in which the inner space is filled with cuts placed athwart seem to be especially preferred.⁵¹ The technique of decorative execution in any one of the several varieties of design just enumerated employs incising, fluting, grooving, and impressing. Frequently the incised work is so delicate that it approaches engraving. The impressing technique depends chiefly on the looped end of a hair pin. Juxtaposition of differently produced decoration on the same specimen is by no means rare. The tools used in the decoration of pots and of pipes are about the same; the edge of a sharp knife, a piece of wire, and a hair pin, however, are particularly preferred in executing the more delicate designs on pipes.

Decoration of those pipes which require hand or tool shaping, of their outward features in applied relief is usually deferred until the details are finished. (*Vide infra*, under drying process.) On the whole, however, such pieces remain unembellished unless they receive some such simple additions as parallel lines, rows of short cuts, serration of the lip or of the rim, etc.

The striking paucity of decoration on vessels is minimized, and to a degree compensated, by the colorful final product which acquires a vivid mottled effect in firing, and is often intensified by a high degree of lustre. The mottling is controllable and appears to afford much satisfaction to the aesthetic desire of the potter, who really values it as a decorative asset. The lustrous quality serves to enhance the mottling.

DRYING PROCESS

With the surface finish (and decoration) completed, the specimen is set aside for drying. The length of time required for this purpose varies from one to several days. In certain instances, large vessels may remain in drying a full week.

reveals no details of the design nor the technique involved; Harrington explains (*ibid.*: 404) that the edge of a cane knife was actually used. His illustration of a pipe-decorating process (*ibid.*: pl. XXII*d*) likewise fails in details.

⁵¹ For sample illustrations of decorated pipes, *cf.* Holmes (1903: pl. CXXVIII); specimens collected after 1876, *cf. ibid.*: 143.

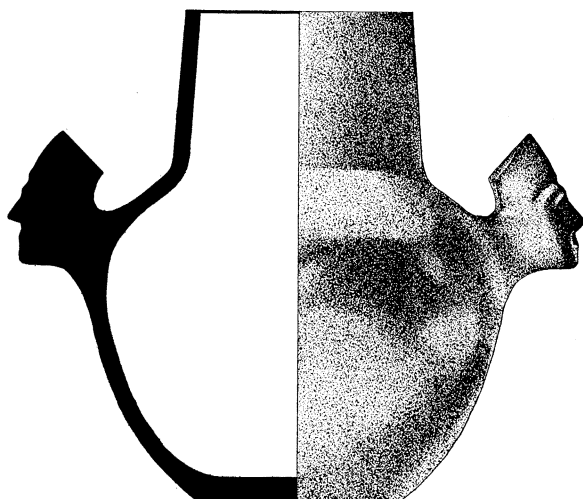


FIG. 27. Cross-section of Catawba vase indicating thickness of wall.

A shady, protected place outdoors, or a dry ventilated room inside, are preferred. Care must be taken that the pieces are not exposed to frost, which would, according to practical experience, inevitably cause chipping and fracturing in firing.

During the drying period, or sometimes after its culmination, the appending of lugs, handles, spouts, and legs takes place. The wall of the vessel selected for such additions is pierced in appropriate locations with the point of a cane knife or an awl. The appendages, comprising lugs and handles, are prepared by modeling or by molding. Their terminal tabs, ovoid, circular, or oblong in cross section, are inserted, secured and fastened from within, and the contact is carefully smoothed in and out to obliterate roughness. (Within the thickness of the wall, however, the bonding is less complete and leaves recognizable traces of the operation.) Sometimes these additions receive their final form before attachment, while on other occasions they are shaped by hand modeling after the appending is completed. Upon breakage, the fired pieces invariably reveal the shape of the tab and the manner of attachment when the retention within the wall is exposed.

The typical forms of the several categories of appendages are characterized by a rather small range of variety. The lugs, distinguished by a single plane of attachment, are predominantly conical and invariably blunt at the apex. The Indian head type, shaped in a pipe mold, is used as a lug (figs. 12*d*, 13, 14, 27), rather rarely.

The handles, always attached at both of their termini, are of two varieties: the band handle, having a strap-shaped body of an elongated rectangle in cross-section; and the rod handle, shaped like a cylinder or a rod, and circular, oval, or rectangular in cross-section. In either case, the handle usually describes a sufficient loop to accommodate a firm hand grip. A "wish bone" type of rod handle has been developed in the past few years; it appears on the slender, pedestaled vase (figs. 24, 25). The spouts range from a mere dent in the lip to a carefully modeled elaborate feature with a pronounced protrusion. The legs, on the whole, closely resemble the forms of the plain lugs; they are mostly conical, although at times cork-shaped, and invariably flattened (figs. 15*b*, 18).

Pipe blanks must be dry before the tobacco bowl is carved out and the stem is perforated for smoke passage, for otherwise the incompletely evaporated paste would be less resistant to distortion; its consistency, when thoroughly dry, retains a satisfactory degree of softness for the carving and piercing. The details of the relieved features, such as the chin, mouth, nose, eyes, brows, and halo of the Indian head type, the serration of the rooster comb, etc., are fashioned



FIG. 28. Mrs. Eliza Gordon (Catawba) at work on a vessel held on her lap. The scraping tool is a kitchen knife.



FIG. 29. Two young Catawba potters employing polishing stones.

by paring, scraping, and carving (fig. 28). (The paste so removed is used again in mixing fresh clays.) Positive appliqué may also be executed; thus, for example, the rooster pipe, which originally had its blank crest prepared in a mold, is now completed, by additional modeling and carving, into a rooster-comb effect. The potter does not find it cumbersome to alter, by addition or reduction, the original shape of a given blank. New or additional decoration is then executed as desired. The final manipulation preceding the firing of pipes involves cloth, bone, or pebble polishing.

All specimens undergo a careful scrutiny before firing begins. Flaws and defects are rectified, here and there a few strokes of smoothing and polishing are added, the security of appendages is tested, and meticulous examination is made of the state of dryness. While the potters do not seem to be conscious of any criterion with which to judge adequate dryness, it appears that they find guidance in the surface color. When a uniform tone of greenish-gray is shown, the specimen is considered ready for firing. Satisfied that the raw product has received ample care, the potter proceeds with preparations for the firing process.

FIRING

Ceramic pyrogenation of the Catawba depends on an open fire in the case of pots, and on a fuel-smothered process confined to a receptacle in the case of pipes. Even the latter mode, however, does not involve the principle of a kiln, and its

temperature maximum is below that of an open fire.⁵²

Some of the older potters still use a plain hearth, or rarely, a pit, out of doors; in any case, the method can be demonstrated upon request.⁵³

While the domestic fireplace has now largely replaced outdoor firing, the technique involved is essentially the same, *i. e.*, it is still based on the principle of the open fire. The main difference between the two means seems to lie in the quantity of specimens which may be subjected to the heat at the same time; naturally, the domestic fireplace can accommodate a smaller number of pieces because of spatial limitations. On the other hand, the shelter of a dwelling is of signal advantage in the control of the fire, and facilitates operation irrespective of weather conditions. It seems to be generally understood by the potters that firing of vessels is not to be done on an excessively hot day; the reason for this is perhaps to be attributed to the physical comfort of the operator rather than to other considerations.

The fuel consists of wood, tree bark,⁵⁴ and corncobs. The firing process begins with the building of a substantial fire in order to establish a fresh bed of ashes which is localized more or less in the center of the hearth. The two classes of the product, pots and pipes, are always fired separately. With the fire well under way, the pots are assembled near by, within a distance of 1 to 1.5 m. There they remain exposed to the radiating heat for perhaps a half hour. Meanwhile the periphery of the hearth has been swept and the pieces have been advanced closer to the fire, being occasionally turned as well. They are, therefore, not subjected to extreme heat until a certain amount of slow evaporation has taken place. The vessels are eventually set close to the fire, in either upright, inverted, or reclining

⁵² At any rate, with the Catawba ware, it seems proper to speak of firing rather than "baking." But it would certainly be wrong to say that these people (or any potters for that matter) "burn" their pots, for clay and inorganic inclusions are not normally pyrognomic.

⁵³ Harrington (1908a: 405-406) describes an outdoor firing operation specifically arranged for his benefit; similar procedure applies indoors. As a rule, vessels are not placed on the ash bed of an indoor hearth; such practice seems to go with firing outdoors (*ibid.*, and Speck, 1934: 70). For illustrations of an outdoor process, cf. Harrington (1908a: pl. XXI*m*), "preliminary heating of vessels"; (*n*), "vessels inverted upon embers"; and (*o*), "firing of vessels."

⁵⁴ Apparently preferred by some of the older potters; cf. Speck (1934: 70).

position, in the last-named instance with the mouth turned toward the flames. As an additional supply of fuel is being consumed, care is taken to confine the limits of the fire to the original bed. Yet, no effort is made to prevent an occasional leaping of flames over the vessels. Frequently the brisk fire expels sparks or bits of embers which settle and are allowed to remain upon the specimens. The contact of such hot particles produces a lasting mark, namely, a lighter discoloration of the surface, which remains recognizable in the finished product. The size and penetration of the spot so occasioned depends on the intensity of the heat as well as on the interval during which the necessary fuel medium remains in contact with the surface of the vessel. Sometimes this medium is applied intentionally, for the potter is well aware of the cause and effect involved. In the advanced stage of firing the hot pots are set practically next to the fire, being turned frequently in the meantime to gain even distribution of the heat. At no time, however, are the vessels placed within the fireplace proper where they would be most difficult to handle. The shifting and turning of the vessels is accomplished with a stick or with the rake which is used in attending the fire.

On two occasions Mrs. Sally Gordon smeared an incompletely fired, hot vessel with a grease-soaked rag, having first cooled it by removal to a comfortable distance from the fire. Asked for an explanation, she responded that such treatment produced blacker and lighter-weight ware. This was later corroborated by the qualities of the vessels in question: they were quite dark, yet mottled, and of a relatively light weight.⁵⁵

Soon after exposure to the heat, the color of the specimens changes from greenish gray (dry state) to a reddish brown or grayish buff, and these tones darken as the firing, a matter of one to several hours, continues. These colors are the basic values, for the dark gray to black effect, which is so often attained, is really produced through a distinctly separate agency. As the specimens are advanced practically next to the fire, a process of carbonization is invoked as soon as fresh fuel, this time largely bark or wood chips, is added to the flames. This process produces

much smoke and creates a reducing atmosphere. If the specimens are no longer turned during this procedure, only the sides exposed to the fire, and their margins, will be colored dark gray to black. The tone may be intensified by placing bits of bark directly upon the specimens with hot clinkers superimposed thereon. Occasionally the burning particle resting upon a vessel (or in close contact with it) generates excessive heat owing to a draft and increased oxidation, and promotes alteration in the surface color. In such cases reduction is prevented. Hence an area so affected becomes extremely light in color. In instances of this kind (limited in intensity and definitely allocated to small spots), color changes to light shades are often apparent in the course of the firing. More often, however, the burning particle of glowing fuel undergoes slow fire consumption, which produces sufficient gas and carbon to create the characteristic surface blackening.

In the case of pipes and smaller vessels, the entire specimen (at times a number of them at once) is placed within a receptacle, such as a metal pail, filled with bits of bark or wood chips; this fuel is then set afire, and allowed to burn for a certain period; unoxidized carbon is thereby retained. At times the burning contents of the receptacle are subsequently emptied upon an ash bed, and heaped over with additional, similar fuel. There the firing continues, again under a somewhat smothered condition and limited oxidation, and eventually results in fairly uniform blackening of the specimens. The pieces first smothered in the fuel within the receptacle undergo a process of slow firing under reducing conditions whereby their carbonization is automatically accelerated. The smoldering bark, being usually decayed and dry, produces gases which come in direct contact with the specimens and are partially absorbed within their surfaces. Wood chips apparently possess the same qualities as bark, for the two types of fuel are used for this particular purpose interchangeably.

The following interesting statement appears in Myer (1928: 522):

Mr. James Mooney, of the Bureau of American Ethnology, described to the author the following method which he had seen the Catawbans use in making their finest black ware: After the vessel or other object has received its final shape, and before it is baked, it is given a high polish by much rubbing with certain very hard and smooth stones or mussel shells with edges properly shaped by grinding. Over these unbaked, highly polished objects selected fragments

⁵⁵ Bushnell (1909: 12) records a somewhat analogous example in the treatment of pipes among the Choctaw: "When thoroughly burned [*i. e.*, fired] it [the pipe] turns rather dark in color, whereupon it is removed from the fire and immediately immersed in a bowl of grease, which is absorbed by the clay and carbonized by the intense heat."

of oak bark are piled, and the heap is then carefully and closely covered with a large inverted unbaked pottery vessel. . . . Over this unbaked pot a large amount of oak bark is piled and then set on fire. This produces considerable heat and bakes the large inverted vessel. The penetrating heat finally sets fire to the oak bark fragments underneath it, which, being shut off from a full supply of air, burn after the manner of charcoal and produce a strong, penetrating black, which reaches to a great depth into the ware, thus producing the beautiful color. The glossiness arises from polishing. The modern Cherokee produce a black which is much inferior to the above by burning ground corncobs in a small excavation in the soil, over which the vessel to be blackened is inverted. They also produce an inferior black by burning corncob meal within the vessel, which, in this case, is covered to prevent too rapid burning of the meal and the escape of the smoke.

The peculiar manner of firing presumably observed among the Catawba by Mooney should be dated to the last quarter of the nineteenth century. The method is neither practiced nor remembered by the contemporary Catawba potters.

One of the most recent innovations in firing is the use of the kitchen stove and a tin wash tub. Vessels to be fired are first placed within such a tin tub, reposing upon its bottom, some six to twelve pieces at a time. The tub is then set upon the stove, in which a moderate fire has been started in the meantime. More fuel is gradually added and the heat is increased, reaching 500° to 600° F. (260° to 315.56° C.). During this preliminary heating, the hearth to be used for proper firing is prepared, and the preheated specimens are transferred to it when they can be handled comfortably with the aid of rags. They are exposed to the heat of the hearth at a distance of about 0.8 m. from the edge of the ash bed. Only a few potters resort to preheating the vessels upon the stove.

Just what may be the reaction of the organic fat added in polishing, or in the process of firing, is not clear. Yet it seems reasonable to expect that its burning increases carbonization. When specimens so greased are completely smothered in fuel, the combination of readily burning organic matter (the fat) and the reducing atmosphere aid in carbonization and smudging. In open firing, a similar, though less generally constant, carbonization results from smoke contact or from smudging by embers; yet oxidation is naturally promoted by the free access of air. Whatever the causes, the blackish coloration is restricted,

so far as its depth penetration is concerned, to the very surface of the wall (either in or out), or more properly only to the polished veneer. However, in the examples of roughly surfaced, corncob-rubbed, unsmoothed, and unpolished vessels which I saw fired at an open fire, the same type of blackening occurred, apparently from smoke contact; its penetration into the wall was again quite superficial. Inquiries revealed that the natives were not cognizant of the causes, although they fully realized the means of achieving the desired effect.⁵⁶ They were inclined to attribute the blackening to smoke alone, especially as they could point to an occasional puff carried by a leaping tongue of flame on to a vessel where a dark spot developed soon afterwards. They maintained that differences in the natural qualities of the clays, and also mere chance, were often responsible for the mottling.

It was not possible to obtain a satisfactory answer as to the criteria determining the completion of firing. With the pipes, which require just about an hour, actual testing is possible, for the specimens are small and can be handled with ease. In the case of large pieces, the changing color seems to be the guiding factor, although the resonance test is perhaps equally important.⁵⁷ The potter taps the vessel's rim with either a firm stick or a piece of stiff wire; at times she employs merely her hand, flicking a finger and striking the rim with the finger nail.

The initial step in firing, that is, the slow heating at a safe distance from extreme heat, brings about gradual drying. The chemical composition of the constituent clays then undergoes a reaction which is evident to the operator through the change of color. Under oxidizing conditions, the ferric elements produce a predominance of reddish or buff pigmentation; a reducing atmosphere, on the other hand, is largely responsible for the gray and black tones.

Finding the color and sonorous quality to her fancy, the potter removes the pieces from the hearth, or extinguishes the fire by disturbing the bed and heaping the ashes in the rear of the fireplace. As in all of the other steps of manufacture, experience and previous failure, unless a

⁵⁶ Cf. Speck (1934: 70).

⁵⁷ Speck (1934: 47, note 1) states: "*atuski*, 'pot, clock,' denoting the hour, is interesting in Catawba semantics. A clay pot rings clear like the stroke of an old clock when tapped on the rim; two o'clock becomes 'two pots, or rings,' and so on. Even the dove, *itusi* . . . earns a sobriquet from its call which resembles a stroke of the clock or a pot."

new experiment is pursued, seem to be the chief guidance of the potter. The specimens which I had an opportunity to watch in the firing process required from one to three hours of exposure to heat. I was told, however, that large pieces may need as much as twelve hours at the fire. As late as 1929 a tradition survived that none but the potter could witness the firing process, but it was not enforced. There are no records of this restriction published prior to that date. The geographically nearest similarity was noted by Bushnell (1909: 12) among the Choctaw.

The following temperatures, determined with the aid of an optical pyrometer, represent characteristic averages:

Open fire, out of doors	1670° F.—910° C.
Domestic fireplace	1760° F.—960° C.
Smothered fire in receptacle	1400° F.—760° C.

A pronounced variety characterizes the color of the Catawba ware. Pieces fired under reducing conditions tend to be predominantly gray and black. The open fire, on the other hand, promotes reds and oranges. However, the majority of the ware is highly mottled; the colorful effect, as has been said, is considered an aesthetic asset; the mottling and the lustre have definite decorative values.

Attempts to express the numerous tones and hues on a single vessel in terms of a standard color scale are apt to meet with serious difficulties. The experience of Mrs. Fewkes and myself discourages me from placing on record the matching of some twenty Catawba pieces with Ridgway's plates (1912).⁵⁸ In one instance four basic tones were discernible (two in the grays, and two in the reds), while the mottled areas totaled forty-eight individual values. It seems adequate—and perhaps safe—to state that the basic colors of the Catawba ware range through the grays, oranges, and reds. Perhaps the most characteristic examples of the grays, as expressed in terms of Ridgway's nomenclature, include pale smoke gray, deep gull gray, mouse gray, and black. The reds and oranges, similarly expressed, comprise: avellaneous, cinnamon, English red, drab, grenadine, sepia, vinaceous, woodbrown. In cross-section, neutral gray and vinaceous buff are the most common colors.

⁵⁸ This work was done by my wife first; then a pottery preparator and I each made separate matchings. The three sets tallied about as much as might be expected from the limits of Ridgway's dependability as against a colorimeter.

The hardness of the Catawba ware ranges from 2.5 to 4, Moh's scale; the majority of the samples taken by me were under 3.5, and the average was 3. These figures apply to both surfaces and disregard the core as revealed by cross-section.

POST-FIRING TREATMENT

Once fired, the Catawba pottery is virtually finished. Some of the older potters either remember or still practice the smearing of hot vessels with a piece of fat (usually bacon rind or ham skin).⁵⁹ Such treatment produces a fine lustre which is particularly noticeable on dark tones; as a rule this process is restricted to the outside surface. Plain wiping with a dry cloth, especially of carbonized pieces, is often performed, although it is not always necessary. The cooled pieces, I noted, usually do not soil one's hands.

At times vessels are decorated, during the stage under discussion, with red sealing wax. This is done by applying a stick of wax over the outer surface of a moderately hot vessel and executing the desired, usually floral or simple geometrical, design. While I have not observed this apparently irregular practice, I have seen and examined about a dozen vessels displaying the sealing wax crustation. It is of interest, in this relation, to cite Gregorie (1925: 21):

Mr. Phillip E. Porcher, formerly of St. Stephen's Parish, who lived to be more than ninety years old and died in Christ Church Parish in 1917, told me that he remembered frequently seeing the Catawba Indians in the days when they travelled down from the up-country to Charleston, making clay ware for the negroes along the way. They would camp until a section was supplied, then move on, till finally Charleston was reached. He said their ware was decorated with colored sealing wax and was in great demand, for it was before the days of cheap tin and enamel ware. This may account for the smooth, fresh fragments I have found on what are evidently old sites of negro quarters.

It seems safe to presume that the use of sealing wax for pottery decoration among the Catawba represents a definitely post-Columbian, and very likely quite modern, acquisition.

Whatever the post-firing care may entail, the chief purpose of handling the specimens immediately after their cooling arises out of a desire to examine each for possible defects. On the whole, casualties in firing are insignificant.

⁵⁹ Dr. Swanton (personal communication) has recorded the use of bear grease upon vessels among the Natchez.

There is no specially provided place for the storage of the final product in the fairly limited dwellings of the Catawba. The main concern, it seems, is to dispose of the output by selling as soon as possible. Merchants from Rock Hill formerly visited the reservation quite regularly to close the bargains, or the natives carried their ware to town and sold to dealers. The producer realized from five cents up to a dollar⁶⁰ and occasionally even more per piece, while the middleman cleared a handsome profit. In recent years, sales to shops at Cherokee, N. C., have reached a considerable volume, but have also forced prices at Catawba to a low level. At the same time the market at Rock Hill has just about ceased to exist.

TIME DURATION OF THE CATAWBA POTTER'S TASKS

The chronology of procedure, as here presented, is fairly constant. Such deviations as sometimes do occur are neither radical nor serious. The actual time element is a variable factor with the individual potter and the diversified steps incidental to the several processes. Clocking of the procedure is not always practicable.

The genesis of a pottery piece coincides with the departure in search of clays. The Catawba do not have to go far from home for pan clay; however, pipe clay is most readily obtainable in the river bottom and requires a ride of some 6 miles. The digging in a clay pit may entail several hours of labor; this includes the initial removal of undesirable matter. The mixing of raw clays takes perhaps an hour, and the shaping of the kneaded paste into lumps is a matter of mere minutes.

The preparation for the building process likewise consumes a short interval of time. With the modeling method, a vessel of a globular shape, with a maximum height and width of 0.1 m. and an average wall thickness of 0.005 m. can, I have witnessed, be shaped within 6 to 8 minutes. Since there is no scraping in such an instance, polishing and drying follow the building. In the stipulated example the specimen remained in drying, under an average temperature of 50° F. (10° C.), for approximately 17 hours; its polishing consumed about 8 minutes, and 2 hours later the potter pronounced the piece to be adequately dried for firing. The wiping, in which a dry piece of fine-textured cotton cloth was utilized,

required about 2 minutes, and was accomplished during the preparation of a hearth for firing. A satisfactory bed of ashes was established in 15 minutes by burning sundry twigs, branches, and corncobs. The firing process of the specimen was completed within 3½ hours. The particular example here described may be considered fairly representative of the several time durations experienced in the case of modeled pieces.

The ring and the circuit variants of building are, of course, more prolonged. The base disk is shaped in a very short time, the average being about 2 minutes, and the cutting of the strips of paste, out of which the fillets are fashioned, is done in 5 to 10 minutes. I had an opportunity to observe a ring-building example which may be tabulated as follows:

	Individual time (in minutes)	Com- pound time
1. Modeling of the disk (bottom)	3	3
2. Flattening of a lump of paste into an irregular slab about 0.01 m. thick, and cutting this into rectangles (repeated four times in order to gain adequate supply)	2	8
3. Cutting out 14 strips, and placing them separately upon an auxiliary board (12 to be shaped into rings, the remaining 2 eventually to become handles); average dimensions of strips: length 0.28 m.; width 0.015 m.; thickness 0.01 m.	1	14
4. Rolling the strips into fillets, and adjustment of their length and girth to uniformity; dimensions: length (average) 0.295 m. (increase over strip due to rolling), diameter (average) 0.015 m.	1	12
5. Shaping and closing each individual ring	1	12
6. Applying, adjusting, and bonding the initial ring upon the base disk	3	3
7. Application, adjustment, and bonding of each of the subsequent 10 rings	1	10
8. Placement, adjustment, and bonding of the terminal (twelfth) ring to form the rim and lip	2	2
9. Smoothing, by hand, the entire body of the cylinder inside and outside		4
10. Shaping of the form, producing a jar globular in the lower portion of the body, with a gently profilated shoulder, and a cylindrical neck		14
11. Scraping; inside and outside (with a cane knife)		9
12. Smoothing the rough surface with moistened hands and with a rag soaked in water		2
13. The vessel was next set aside for drying on the mantelpiece; the average temperature of the room was about 60° F. (15.56° C.); the vessel remained in		

⁶⁰ Speck (1934: 71) records 25 cents.

- drying for 41 hours. Thereupon, the resumed operations entailed:
14. Pebble polishing, over the entire outward wall, bottom, and approximately three-quarters of the height of the neck on the inside. 13
 15. Appending of 2 diametrically opposed, flattened, sharp-edged rod handles, akimbo in appearance, each attached on the neck and shoulder respectively, utilizing 2 of the 14 strips of paste (see step 3), but modeling the shapes after attachment. 7 14
 16. Final adjustment of rim by flattening its lip. 1
 17. Restoration of pebble polish in areas affected by the attachment of the handles. 2
 18. Polish with a piece of bacon fat. 2

The specimen was now in its completed plastic stage.

The handles, made of the two fillets which during the drying interim were placed under moistened paper, required about 4 hours to be freed, by normal evaporation, of the bulk of their admixed water. The partial drying incidental to their storage despite the proper protection, was dismissed by the potter as inconsequential.

Thus the total compound time up to this stage amounted to 2 hours and 5 minutes.

Preparation for the firing process, with all the necessary prerequisites and accommodations close at hand, was a matter of a very few minutes. The ash bed was formed in approximately half an hour, with fuel similar to that cited in the instance of the modeled piece.

The vessel under description, and other pieces previously made, were examined for defects and, being found satisfactory, were placed on the floor before the fireplace at a distance of about 1.5 m. There they remained exactly 40 minutes, being turned, in the meanwhile, about every 10 minutes. Then they were advanced within 0.7 m. of the ash bed, allowed to be examined by me in the process, and having been turned at intervals of approximately 5 minutes each, for fully 1 hour, were finally pushed practically into contact with the frequently fueled flames. There they were permitted to remain, with still additional turning, at an average frequency of 20 minutes (the rake being called upon for the purpose), for 2 hours. The computed time of the graduated firing, therefore, totalled 3 hours and 40 minutes. Upon the completion of the firing, the glowing embers were extinguished by raking and the ashes were heaped into the rear of the fireplace. Thereupon the vessels began to cool.

At the end of half an hour they were hot; in another 15 minutes they were quite warm, and 10 to 15 minutes later they could be handled comfortably. Certainly the maximum time necessary for their complete cooling did not exceed 1 hour; the room temperature averaged about 68° F. (21.11° C.). The time consumed in the examination of each specimen then varied from 1 to 3 minutes, the particular vessel here described requiring little over 2 minutes to be pronounced entirely satisfactory. As the final touch, the potter rubbed the batch with the same piece of bacon fat previously used by her in culminating the pre-fired surface treatment; this took but 5 minutes of her time.

Mrs. Sally Gordon, the operator in both cases here timed, was a very skillful and speedy potter. Her dexterity, efficiency, and form tastes were, I think, distinctly above the average. The record of Mrs. Sally Gordon, proudly revealed by herself and corroborated by others, of having completed eight vessels by ring building, two by modeling, and adding a half dozen molded pipes, all in the span of a single working day, represents an outstanding achievement.

Two hours seem to represent a fair average for the construction and surface finish of a simple form; attachment of appendages, curvatures in shape, etc., may call for an additional mean of about 30 minutes. This estimate is equally applicable to the ring and the circuit modes of building.

The sectional building process approximately doubles the time necessary for the uninterrupted procedure. The largest, and most complicated vessel ever so produced within the memory of my informants, was said to have arrived at its final state of construction after some 6 hours of uninterrupted work.

A pipe blank can be modeled by hand within 5 minutes. The molding of a pipe in a double form is usually a matter of 10 to 12 minutes (fig. 8). In either case the surface treatment is partially achieved concurrently, and if done entirely separately, it requires no more than 8 minutes. The decoration is more tedious, the plotting of the motif taking as much as 20 minutes; yet the actual execution of the design can be accomplished within half that time. Drying takes one day or less, the carving of the tobacco bowl and the perforation of the stem for smoke passage some 20 minutes, and firing about 1 hour, while the final polish is often done in as little time as 1 minute.

TECHNOLOGICAL MISCELLANEA

This section is concerned only with certain *mechanical* aspects of technology. Such aspects pertain primarily to the constructional, surfacing, and finishing processes. On the other hand, those approaches which depend chiefly on ceramics, chemistry, optics, petrology, etc., may be collectively designated as analytical technology. Naturally, the domain of ceramic technology—unsatisfactory as the term itself may be—should bring about a co-ordination of the two subdivisions. Its subject matter is so involved that it defies the control of any individual, and yet a high degree of overlapping must inevitably be recognized. It is a fortunate circumstance that the American specialists in pottery technology, representing a variety of qualifications and interest, have already reached a division of tasks. This was demonstrated by the conference held in November, 1938, on which a brief note appeared in *American Antiquity* (4 (4): 358–359, 1939).

With the Catawba, true coiling is totally unsubstantiated either in literary sources or in the recollection of those informants whom I interrogated. (When the potters themselves refer to “coiling,” they actually have in mind the annular variants of construction.) The archaeological sherds collected and examined by me at the reservation revealed no evidence of coiling. It is interesting to note, in this connection, that Catawba potters settled amid the Cherokee, with whom coiling unquestionably formerly was really characteristic, appear not to have adopted this method. That such women may well have seen Cherokee potters use coiling must be admitted as a reasonable certainty.

The circuit and the ring variants, the Catawba insist, offer equally convenient means of wall-building. Both are commonly used, and are said to be equally old. With respect to the validity of this contention, it may be stressed that witnessing of the two variants convinces the observer of their equal expediency as to manipulation and speed. The construction of a blank cylinder, subject to subsequent form-shaping, a characteristic phenomenon at Catawba, is also believed by the natives to be an old practice; indeed, it appears to be preferred to tecto-shaping. It seems permissible to presume that certain curvatures might easily be attained—consciously or unconsciously—in the process of fillet-building, depending on the circuit variant or even perhaps

on the rings. During my observations I did not notice any deliberate attempt to do so.

The cylinder itself, as has been stated, is a characteristic peculiarity in the Catawba building technique. Its several advantages are particularly favorable to the separate step of shaping the form. The dimensions of the finished form often radically differ from those of the blank. By way of a concrete illustration of this point, I may return to the example for which time equivalents in construction are tabulated in the preceding section. The cylinder in question, when completely erected, had a maximum height of 0.135 m. (Theoretically, the maximum of the superimposed but unpressed rings, twelve in number, added to the base disk 0.015 m. thick, and the adjustment of the rim, compute to a total of 0.15 m. The factual measurement of 0.135 m. reflects the alteration, *i. e.*, compression, effected by the bonding.) The body of the cylinder was fairly regular in curvatures; when its erection was completed, the mean mouth diameter measured 0.083 m. (reading on the inner side of the rim), whereas the mean maximum diameter of the bottom, taken on the outside, amounted to 0.105 m. The fired vessel has the following maximum measurements: height, 0.153 m.; diameter of body (outside limits), 0.104 m.; diameter of bottom, 0.065 m.; diameter of neck at its junction with the shoulder, 0.075 m.; mouth diameter (outwardly), 0.065 m.; thickness of wall (taken at the lip), 0.004 m. (fig. 15*a*).

This same vessel has a grayish buff color, and approximately one-half of its outside surface has mottled areas in varying shades of orange and gray. Their distribution begins on the lip, runs over the neck, handles, and belly, and also the bottom. The variegated effect is due to oxidizing atmosphere, to reducing gases, and to smoke carbonization. The upper inside margin of the neck is only faintly discolored in blackish gray in places adjacent to the lip mottling. The bottom shows an undiscolored spot, some gray and black tones, and a most instructive streak of a slightly darker shade of the basic color. The streak, darkened by the carbon of the smoke rolling up the wall, is also plainly visible on the belly through a similar, although smaller, zone, which indicates where the smoke stream started. While reducing conditions prevented mottling of the streak on the bottom, oxidation stimulated it on the exposed belly. The smoke was derived from several slow-burning clinkers expelled from the fire and settled near the vessel (which re-

mained in an upright position throughout the firing); the blackening was then due to reduction and acute carbonization. The streak on the belly, however, was partially subjected to additional penetration of smoke and was somewhat darkened thereby; a close examination reveals the extent of its original distribution. The darkest tone of gray appears on the lower portion of the belly, off the base. In watching the firing, I noticed that a well-glowing clinker became wedged there and promoted the process. In the areas of its closest contact with the vessel, the basic color was not changed. However, marginally, and only vertically up the wall, excessive blackening resulted, being quite sharply delimited by an undulation in one spot, and rather blurred elsewhere. The severe demarcation appeared to be incidental to two factors, namely the shape of the contacting portion of the clinker, and the concentration of reducing gases immediately above it. The smoke found freedom in rolling upward; the soot settled upon the surface of the vessel in a broad span running over the lip and also reaching the inner side of the neck. I suppose that the heat rising from the interior of the vessel prevented its deeper penetration inwardly down the neck. The same rolling column of smoke also left traces on the sides of the handles facing its course; however, certain deflection took place there as evidenced by the discoloration of the horizontal bars of the handles. The handles have their edges defined by unequal sharpness and angularity. It is interesting that in the one having a more or less rounded form, the smoke coloring continues quite gradually on to the planed underside. The angularity of the other, however, all but stopped this distribution. A similar phenomenon is visible on its laterally opposite edge, but is due to another batch of smoke. Elsewhere on the body other splotches, each the result of smoke contact, are present.

Despite the knowledge gained from observing the processes just described, certain elements operative in mottling remain unexplained. Outstanding among these are the common examples of concentric shading within a given spot; the formation of peculiarly distributed areas on the interior of a vessel; and the frequent occurrence of spattered, small blotches, apparently occasioned wholly by smoke rather than by contact with individual clinkers. Whether or not it is possible to rationalize these phenomena inductively remains to be determined. The point should be pursued by further inquiry; it is possi-

ble that high-speed photography and special filters might be helpful in such an endeavor.

Similarly, the use of blood or fat in the preparation of paste, and their full significance and value, are incompletely understood. As already stated, I did not see the practical application of such media during my studies.

CHEROKEE POTTERY-MAKING

It seems appropriate at this time to consider the present status of pottery-making among the Cherokee, whose industry has been under Catawba influence for a considerable period of time. If it is permissible to speak of acculturation in this individual instance alone, then the phenomenon involved illustrates an acute example of its practical, dynamic manifestation. Now that imported pipe and pan clays from Catawba have replaced the allegedly depleted local supply, the superficial resemblance between the two categories of pottery is very close indeed.

Mooney (1900: 164) spoke of Ewi Katalsta as "the last conservator of the potter's art among the East Cherokee." Her process was observed as late as 1908 by Harrington (1908b: 222 ff., pls. 2-10).⁶¹ It was previously described by Holmes (1903: 56) who obtained his information from Mooney; and Holmes (1903: 53) also wrote of Catawba potters among the Cherokee, likewise after Mooney. One of these, named Susan, the wife of the Cherokee ex-chief Sampson Owl, was a constant maker of pottery, entirely in the Catawba style, for over forty years;⁶² she died in 1934.⁶³ Her daughter, her relatives, and others who desired to learn the craft, were readily taught by her or copied her procedure.⁶⁴

Ewi Katalsta⁶⁵ was her contemporary; it can be demonstrated, I think, that even she was not immune to influences of the Catawba potters living at Cherokee. That she could have adopted certain elements from Catawba immigrants at Cherokee is, of course, wholly within the realm of probability. Moreover, it is possible to point to

⁶¹ Harrington stated that there was, in 1908, only one other potter at Eastern Cherokee, "an aged woman known as Jennie Arch, whose feeble hands had all but lost their skill." He apparently was not cognizant of Susan Owl; *vide infra*, and Speck (1939: 25-26).

⁶² Personal information from Dr. Speck.

⁶³ The date is apparently only approximate; *cf.* Speck (1939: 26).

⁶⁴ Personal information from Dr. Speck.

⁶⁵ Ewi Katalsta was still a somewhat active potter as late as 1913; she died about 1926. (Information from Dr. Speck.)

concrete evidence that this was actually so. Mooney observed that "in building she [Ewi Katalsta] *sometimes*⁶⁶ used one long coil which was carried spirally from the bottom to the rim after the manner of the ancient Pueblos and the Louisiana potters."⁶⁷ There is no explanation as to which mode of construction she employed *otherwise*. Conjectures are unnecessary, for Harrington's account of Ewi Katalsta's building furnished conclusive proof of its analogy with the circuit variant of the Catawba: she applied the paste roll, and adjusted it, "pinching it fast the while *until the circuit was completed*. The coil proved too long, so she broke the superfluous piece off and blended the two ends together with care. . . . Thus the coiling proceeded until the required form and height were reached."⁶⁸ Note also the omission of temper in the instance witnessed by Harrington (1908b: 224), which is yet another Catawba rather than Cherokee characteristic.

In 1929 Dr. Paul Kirchhoff collected an old vessel in the Cherokee country,⁶⁹ which seems inferentially attributable to the work of Ewi Katalsta.⁷⁰ The specimen (fig. 30) embodies a debased Cherokee form and decoration (grooved, pointed garlands, each formed by four parallel lines, with a fringelike effect, vertically placed, and a similarly executed cross-hatched design on the neck, which is slightly raised above the shoulder) and typically Catawba polishing.⁷¹ The shape of its body approximates presumed ancient Cherokee forms,⁷² and the execution of the decoration resembles similarly ornamented sherds thought to be of Cherokee provenience.⁷³

⁶⁶ Italicized by the present writer.

⁶⁷ Holmes (1903: 53). (The extraterritorial comparison may have been drawn by either Mooney or Holmes; that, however, is irrelevant to the point under consideration, which applies to the Cherokee potter.)

⁶⁸ Harrington (1908b: 225); italics by the present writer. Cf. Holmes (1903: 53-54) for identical procedure by two Catawba women at Cherokee in 1890; Holmes's index (p. 207), not text, classifies this as *coiling*.

⁶⁹ Specimen originally deposited in the Department of Anthropology, University of Pennsylvania, where I have examined it.

⁷⁰ Dr. Kirchhoff accompanied Dr. Speck and myself to the Catawba reservation prior to his trip to the Cherokee. (The vessel in question impressed him as a valuable specimen, and he investigated, without positive success, its history; personal information from Dr. Kirchhoff.)

⁷¹ I am obliged to Dr. Speck for permission to refer here to this interesting specimen.

⁷² Cf. Harrington (1922: pls. XLIX*d* and LII; also pls. XLIX*g* and L, both from Tennessee).

⁷³ Harrington, 1908b: pl. LVII*a* (particularly the lower three scrolls of the left portion of the design), *d*, and *f*.



FIG. 30. Cherokee vessel, probably the work of Ewi Katalsta. Collected by Dr. Paul Kirchhoff.

I am not acquainted with analogous comparisons in so far as the decorative motif and the rim treatment of the vessel collected by Dr. Kirchhoff are concerned. At any rate, the specimen, whether the product of Katalsta or not, illustrates perhaps one of the last flickers of the now vanished Cherokee work based largely on their own traditional expression. Although it is not possible to judge the building technique accurately from surface appearance, a certain amount of concentric alignment, not all due to polishing, suggests an annular method. The present concern with Katalsta may well be terminated by recording Dr. Speck's significant statement that "by 1913 Ewi was no longer a potter purely in the Cherokee style, but markedly influenced by Catawba methods."⁷⁴

At the present time Catawba-type and Catawba-inspired ware is being produced by the Cherokee as a permanent source of revenue. The tourist trade, served by "craft shops" on the reservation and elsewhere, provides the chief market. In season the demand is quite lively, and the local potters are unable to produce an adequate supply. The shortage is made up by the Catawba, who either bring their products to Cherokee in cars, or sell them at their reservation to visiting shopkeepers and agents from western North Carolina and elsewhere. Thus Catawba

⁷⁴ Personal information from Dr. Speck.

pottery is often sold as a Cherokee product, or farther away from the Smoky Mountains National Park, simply as Indian pottery. To one acquainted with the characteristics of the Catawba ware, the identity is immediately obvious no matter what the label. It seems appropriate to note that some Cherokee potters have been approached by commercial buyers from Minnesota and Arizona. However, there has been no favorable reaction to such offers, perhaps chiefly because the local market is so good. A proficient potter at Cherokee, according to local information, may realize as much as twelve hundred dollars on sales of her ware within a single year. Such an income, almost entirely clear profit, provides a revenue which, in view of local standards and economy, is quite considerable if not extraordinary. (At Catawba, an entire family of potters with four expert women at work and one or two men to dig clays, does not make six hundred dollars in a year.)

As late as 1934, Dr. Speck collected three vessels made by Mrs. Maude Welch, a native Cherokee and an accomplished potter, of which



FIG. 31. Mrs. Maude Welch (Cherokee) working on a pot on which Indian heads with braided hair are used as lugs. A pair of toothless combs, a spoon, and a knife are among the tools upon her working board.

two are of the Catawba category and one in quasi-old-Cherokee style, paddle-stamped.⁷⁵ The paddle-stamped specimen is quite inferior in fabric and general execution as compared with the two Catawba-inspired pieces made by the same potter. Truly, the latter two pieces rival the average ware now manufactured at Catawba. In 1941 Mrs. Welch informed me that she used local clay in making the stamped pot, and Catawba clays (pan and pipe) in the other two pieces; and that she constructed all three vessels by the circuit method.

The contemporary Cherokee no longer manufacture any of their own original type of pottery. Similarly, vessels distinctly characteristic of the Catawba quality and technique, and yet combining such native Cherokee elements as coiling and the use of the paddle, are also not made any more.

Mrs. Lillie Bryson (*cf.* note 2) continues to make typical Catawba-style pottery which is sold as Cherokee product. She, like Mrs. Welch, uses Catawba clays; moreover, her former experiences at Catawba still tend to dominate her work. She is, therefore, less inclined to deviate from old tradition, although not always successful in resisting certain new temptations.

With the express permission of Dr. Speck, I should like to mention a particularly interesting and instructive pot manufactured by Mrs. Bryson late in 1935. This is a vessel of a globular body with two independent necks. The necks are surmounted by a ribbon handle forming a high loop and attached to the mutually opposed margins of each rim. In 1935 Dr. Speck was informed by Mrs. Bryson that the specimen was originally conceived by her to serve the purpose of a wedding gift; her idea, it seems, was motivated by a desire to symbolize the union of the intended recipients. Mrs. Bryson reiterated the substance of these statements in answer to my inquiries in 1941. However, my further pursuance of the subject—since the “wedding pitcher” is now quite common both at Cherokee and at Catawba—revealed a significant factor. In 1935, at an Indian fair held at Atlanta, Georgia, several Pueblo potters are said to have been present, among them the renowned Maria Martinez of San Ildefonso—at least that was the name my informant was able to recall with some help on my part. In any case, the Southwestern

⁷⁵ All three specimens originally in the Department of Anthropology, University of Pennsylvania, where I have examined them with Dr. Speck's permission to mention them here.

artisans demonstrated their native pottery-making, and the vessel with two necks, a normal Pueblo form, was among the finished products. Mrs. Youngbird, a Cherokee potter, attended the fair, and it appears quite certain now that she is to be credited with the introduction of this Pueblo form at her reservation. Mrs. Bryson's claim to independent invention of the pitcher with two necks has a counterpart at Catawba. And yet it was possible, by following chronological evidence and trade contacts, to reconstruct the actual course of events. Catawba potters, visiting Cherokee to sell their ware, noticed the new form *after* 1935 and promptly adopted it as an expedient economic advantage.⁷⁶

Mrs. Bryson, now living at Ela, 6 miles away from the Cherokee reservation, is a very active potter. Her products are made from imported Catawba clays, and upon the principles of Catawba techniques from start to finish. They are easily recognizable in the several "craft shops," and can be fully identified by the maker's name and affinity appearing on the bottom. Mrs. Bryson has added the pitcher with two necks and the frog pot to her forms since she took residence at Cherokee in 1930.

Dr. Speck secured yet another interesting vessel during his 1935-1936 work at Cherokee. This is a bowl with a frog figure in positive relief enveloping the upper portion of its body,⁷⁷ recently made by Mrs. Maude Welch. The occurrence of the applied frog motive was *presumed* amid ancient Cherokee (?) pottery by Harrington (1922: 283).⁷⁸ According to her own statement, Mrs. Welch arrived at her idea through observation of archaeological specimens in the B. S. Colburn collection at Biltmore Forest, North Carolina.

⁷⁶ The vessel with two necks made by Mrs. Bryson in 1935 has, in the meantime, been published; cf. Pennypacker (1937: 147-148, fig. 1). However, Pennypacker gave no account of its then alleged history; his statement that "archaeologically these pots have a very wide distribution which extends from Canada to Florida along the Atlantic Coast" is certainly contrary to truth.

⁷⁷ The vessel is somewhat analogous with the specimen shown in Harrington (1922: pl. LIX), but the modern piece has the frog more pronouncedly in relief. I am indebted to Dr. Speck for permission to refer here to this vessel.

⁷⁸ Such presumed Cherokee provenience of the frog pot amid archaeological remains in the Southeast cannot claim any recognition, since there is no positive evidence to support it. The frog is not represented among the pottery remains recently found in historic Cherokee sites in Tennessee (personal information from Miss Madeline Kneberg).

Mrs. Welch is doubtless the most skillful native Cherokee potter at the present time. She learned her craft at Catawba, where she still visits occasionally, and is, on the whole, rather conservative. The frog pot, and a conoid jar with applied snake about the body or with two Indian heads provided with braided hair (fig. 31), are typical and ever readily recognizable on any store counter. (They are usually identified by her name and residence inscribed on the bottom.) The local trade prefers her products, and they bring higher prices. Mrs. Welch makes relatively few pitchers with two necks, which she views as outside intrusions not in line with domestic tradition. She obtains her clays from the Catawba reservation, uses two parts of pipe clay and one part of pan clay in making vessels, and employs the circuit variant of annular fillet construction. She resorts to modeling only in producing small pieces. Mrs. Welch relies rather heavily on the use of a moist rag for smoothing, reducing wall thickness, and even some shaping, as well as polishing. Her tools depend more on modern kitchen pieces than on native means; mussel shell, gourd, cane knife, bone polisher are not included in her tool assemblage. On the other hand, the polishing pebble is of prime importance, also a cherished possession, and usually quite old. Mrs. Welch employs modeling in making pipes, the Indian heads, and the snakes and frogs for appliqué; the blanks are quite crude in either instance, but carving with a metal knife-blade and smoothing with a wet rag eventually lead to the execution of delicate details in many cases. The applied features are in all cases solid, irrespective of dimensions; special care is taken in their drying process, which is invariably prolonged, and in the firing, which is done very slowly and under minutely controlled increase of heat. Mrs. Welch fires her products at an outside fire and as a rule preheats them in a washtub on the kitchen stove.

Aside from Mrs. Welch, there are some five or six native Cherokee women on the reservation who make pottery more or less occasionally. Their standards and skill are not comparable to those of Mrs. Welch and Mrs. Bryson. Moreover, it appears that these unstable potters are responsible for some of the most grotesque products at Cherokee, such as the figure of a squaw with a papoose on the back, imitations of modern industrial pottery forms or their various features, etc.

The "craft shops" at Cherokee offer the gulli-

ble tourist numerous gift "attractions" and appear to be doing a thriving and profitable business. It is quite natural, then, that the pressure of commercial opportunities exerts its influence upon the local sources of supply. The potters are exposed to a veritable motley of temptations to which they succumb, either of their own will, or upon an impressive sales talk, rather easily. The result is often quite ghastly from the ethnological standpoint, although it may well delight the average tourist. The shopkeepers are interested in the profit, and the natives appear to be oblivious to the potential ultimate consequences of abandoning old tradition. As a result, truly native pottery-making no longer exists at Cherokee.

The agency school had an opportunity to salvage and resurrect the craft during the last decade, but the attempt actually made was a failure. Instead of stressing native methods, the potter's wheel and a kerosene kiln were introduced. Photographs of archaeological vessels from the Colburn collection were used as models despite the circumstance that they did not include a single specimen of true Cherokee affinity. Apparently the lack of a competent instructor, acquainted with the history and technology of native Cherokee pottery-making, was a particularly serious handicap. In any case, the abortive endeavor to attract and stimulate local interest made no impression on the active potters, although some of the artisans participated in the initial work. The school authorities are anxious to secure a properly qualified instructor, and it is to be hoped that the significance of retaining native procedures will not be overlooked. The clay shortage is to be met by importation of suitable supplies to be sold, under government supervision, to local potters at cost. It should certainly be expedient to obtain an ample clay supply at Catawba. And it cannot be urged too strongly that the wheel and kiln be relegated to oblivion in the contemplated program. The history and tradition of Cherokee pottery lend themselves well indeed to rational vocational training.

As has been stated, pottery-making at Cherokee has lost the truly native procedure in which aboriginal methods predominated. And yet some specimens may even now be found on the reservation which, although quite inferior in execution and fabric to the old style, retain certain elements of native technique. Such specimens are recognizable by the admixture of crushed pebbles for temper, often by the use of the coiling

method, and by the carved wooden-paddle stamping or textile-wrapped paddle impressions;⁷⁹ the blackening of the interior, achieved by the firing of readily burning fuel,⁸⁰ such as bran,⁸¹ corncobs, or tree bark; the seemingly lesser degree of care given to clay selection, which stands out in particular contrast to the Catawba practices;⁸² and by the surface color, which is almost entirely buff (on dull ground) and only rarely blackish (on lustrous ground). Holmes (1903: 56) viewed "the application of a black glossy color by smother-firing" as one of the chief differences between Cherokee and Catawba wares. According to Harrington (1922: 196), the native Cherokee processes "probably are practically the same as in prehistoric times." This assumption is quite vague in view of the author's own concept (1922: 174-175) of an early group and a later group of aboriginal Cherokee pottery. Harrington does not give the manufacturing technique for either group. Holmes (1903: 161) inferred, although not conclusively, the "coiling" method.⁸³ Mooney was informed by a Catawba woman at Cherokee that "the manner of baking by which a rich black color was given the ware was . . . acquired from the Cherokee" (Holmes, 1903: 53).⁸⁴ As far as possible interchange between Cherokee and Catawba potters in earlier ("pre-historic") times is concerned, there is no sufficient ground for deductions.

The pottery now being made at Cherokee comprises pieces produced by transplanted Catawba methods, either locally taught by Catawba immi-

⁷⁹ *I. e.*, purposely applied for decorative purposes, not incidental to the shaping manipulation.

⁸⁰ Probably also practiced by the ancient Catawba.

⁸¹ *Cf.* Harrington (1908b: 226) and Holmes (1903: 56), where "wheat or corn bran" is specified. This method was occasionally used by Mrs. Welch even in 1941.

⁸² This peculiarity is perhaps explainable as being due to the shortage of suitable clay. According to Mrs. Welch, the best deposits, situated on Soco Creek (*cf.* Harrington (1908b: 224)), became unavailable about twenty years ago, when some buildings were erected upon the clay beds.

⁸³ *Cf.* also Holmes (1903: 50-51) for the assumption that in the Eastern United States "the strips of clay were wide, irregular, and rude, and . . . rarely showing traces of their employment." Yet, immediately thereupon, Holmes stated: "Specimens from many sections of the Eastern United States fracture along the strip junction, thus revealing the fillet, and the manner of their manufacture." It may be recalled, in this connection, that Catawba women settlers among the Cherokee appear never to have adopted the true coiling technique.

⁸⁴ Fuel-smothered firing, reducing conditions, and controlled mottling are all commonly employed at Catawba to attain black or dark gray tones; the methods involved appear to be survivals of old practices.

grants or acquired by Cherokee women at the Catawba reservation. Except for certain modifications resulting chiefly from lesser general skillfulness, and some differences in form, this pottery resembles that of the Catawba reservation. To one familiar with the latter, however, the inferiority of the Cherokee product, qualitatively speaking, is quite obvious. The surfacing and the color scheme of the Cherokee-made pottery do not equal the aesthetic effects attained by Catawba women at their home. Since Catawba clays are generally used now, the basic similarities in outside appearance should be rather close. And yet there are clear-cut differences even between the products of Mrs. Welch, the best native potter, and those of Mrs. Bryson, who originally came from Catawba.⁸⁵ It appears that at Cherokee, within the last decade in any case, the potters were confronted with a lively and gradually increasing demand for their vessels. To meet the situation, and thus properly to capitalize on the opportunities, production had to be accelerated. Consequently, some of the details of technique suffered and the general care became rather superficial. Although promising local talent clearly manifested itself from time to time—as exemplified by Mrs. Welch and others—its potentials evidently did not stimulate any craft consciousness among the artisans. Therein lies the fundamental difference between contemporary Cherokee and Catawba potters. The Catawba women, and indeed the “nation” at large, are proud of their craft; they derive a definite sense of satisfaction from practicing it, and its economic value, although an asset, is certainly modest. The Cherokee had lost their own native methods over two decades back when Ewi Katalsta ceased to be active. They subsequently resumed pottery-making through Catawba tutelage, which became more pronounced than ever before. Ultimately, Catawba technical dominance became supreme at Cherokee, and continues to be to this day. However, the Cherokee never quite grasped the finesse which characterizes pottery-making at Catawba. Perhaps there has not been adequate time yet for a thorough assimilation. Whatever the rationalization, the circumstance cannot be overemphasized that the potter’s craft at Cher-

⁸⁵ The products of Mrs. Welch and Mrs. Bryson can be readily recognized in the motley groups of pottery for sale at various shops. The respective names of the two potters appear on the bottoms, so that precise identification is possible.

okee, as now practiced, is nurtured primarily by the thriving tourist trade.

Forty years ago Holmes wrote (1903: 142): “It is not yet possible to make a satisfactory analysis of the pottery of the Carolinas.” Referring to the pre-Columbian ethnic complexity of the area, he also stressed that the field has been “little studied,” a point which remains true today. In extant literary sources information on Catawba and Cherokee pottery technique is sadly deficient throughout the period antedating the observations of Palmer and Mooney. For the Cherokee, Timberlake (1765: 62) merely mentioned their “two sorts of clay, red and white, with both [of] which they make excellent vessels, some of which will stand the greatest of heat.” Butel-Dumont (1753, 1: 154; 2: 271 ff.) and Du Pratz (1758, 1: 124; 2: 178 ff.) recorded certain eighteenth century practices in Louisiana. On the other hand Lederer (1672), the first European to publish about the Catawba and the Cherokee, did not mention their pottery at all. A century later Smyth (1784: 193) referred to Catawba pottery as “an ill-formed kind of half-baked earthen ware.”⁸⁶ This statement, obviously, is valueless for the present purpose.

Commenting on modern Cherokee potters, Holmes (1903: 143) described them as skillful and stated:

Their ware has several points of analogy with the ancient-stamped pottery of the South Appalachian province. Their ware retains more of the characteristic elements of form than does that of the Catawbas and the stamps they use in decoration are identical in many respects with those found used in the entire region extending from southern Florida to Virginia.

(It is to be remembered that Holmes did not observe either Catawba or Cherokee potters at work. His judgment was based on notes taken by Palmer and Mooney, and on vessels collected by them. His lack of field observations was a serious, although not consciously recognized, handicap.) And referring to former Iroquois manufacture, Holmes wrote (1903: 161): “Evidences of the building process are obscure, but there is no reason to suppose that other than the *usual methods* were employed.”⁸⁷ Cushing (1894:

⁸⁶ Bushnell (1906: 673) quoted this passage from Smyth without any comment.

⁸⁷ Italics those of the present writer. Obviously, Holmes’s negative comment has no specific value. The obscurity in question is not to be minimized in so far as complete, undamaged vessels are concerned, although even in such cases certain distinguishing criteria of technique are often discernible.

227) considered Cherokee pottery-making more difficult and tedious than that of the "shore people," but did not substantiate his contention.

PAMUNKEY POTTERY-MAKING

Formerly certain constituent tribes of the Powhatan Confederacy (in the sense of post-British contacts) had a "smooth" ware which resembled, as Speck (1928: 411 ff.) has shown, that of the Catawba. The Virginia category of this pottery, differing from that of the Carolinas chiefly in its powdered mussel-shell temper, is perhaps to be assigned to the Chickahominy, the Mattaponi, and the Pamunkey (Speck, 1928: 339 ff.).

The smooth ware which finally usurped the style and technique at Pamunkey was known to the natives of much of the east. Sherds of the same texture and surface are found in the Cherokee region, among the Catawba, and all over the tide-water Algonkian habitat from the North Carolina-Virginia boundary to the head of Chesapeake Bay. We have specimens to illustrate this from the Chickahominy through the country to the Nanticoke area of Delaware. (Speck, 1928: 411-412.)⁸⁸

The nineteenth century methods of the Pamunkey potters, who appear to have abandoned their manufacture for local needs with the advent of the railroad in years antedating the Civil War (Speck, 1925: 409), were observed and described by Pollard (1894).⁸⁹ Drawing on this record, Holmes (1903: 153) added certain comparisons, namely that "this pottery corresponds somewhat closely in general appearance with that of the Cherokees and the Catawbans."⁹⁰ Harrington (1908a: 406) referred to modern Pamunkey pottery as "crude attempts for the curio hunter."⁹¹ However, twenty years later Speck (1928: 409 ff.) presented a convincing account of the traditionally remembered potter's craft at Pamunkey.⁹² This conclusively proved Catawba deri-

vations, which Speck (1928: 414 ff.) traced historically. Especially significant are his details regarding the initial preparation of the basal disk, the building of the wall, which was done by "adding thin layers of clay paste," direct shaping by modeling, and also his statement that "the coiling was not followed in recent times" (Speck, 1928: 410-411). All this represents a new contribution. Speck's description (1928: 411) of the method of scraping, pebble polishing, and fuel-smothered firing corroborates the previous observations of Pollard (1894: 18). The latter author, however, spoke of "kiln baking," without explaining the contraption.⁹³ It is possible that the Pamunkey arranged their fuel in a manner which may have impressed Pollard as a kiln. Speck's specific description (1928: 411) induces an acceptance of such a possibility: "Next comes the burning of the pots in the open fire hearth. The Pamunkey cover the jars with corn-stalks and pieces of dry pine to give them a light-gray color. The stalks and bark are piled over them to cover them in burning."

Speck's comparisons of modern Pamunkey and Catawba methods should be applicable, in view of his genealogical studies, as far back as the first quarter of the nineteenth century; this deduction led him (1928: 418) to the following conclusion: "Would it not seem plausible, then, to ascribe an early manufacture of the smoothware to both surviving groups?"

At Pamunkey, according to Speck (1928: 402-404, figs. 101, 102):

Its sporadic occurrence, its localized abundance, and some historical circumstances, as well as the ethnological conditions among the present Indians of the region, point clearly to the conclusion that the ware of this type came into being after the natives had changed their economic habits resulting from contacts with the English. . . . The ware is characterized by being very smooth, hard and fine-grained, the clay free entirely from sand and grit, yet full of powdered mussel-shell. Its color is light brown or uniform drab or gray. No incised or depressed decorations are found in the body. A few rims only show any attempts at embellishment, which then consists of fine impressions or dents, sometimes of finger marks. Next is the most important thing: numerous angular bottoms, parts of curved handles or lugs, legs and knobbed lids, together with evidence of flat bottoms and the exclusive lipped rim style, are indications of a modification in form, bringing them into correspondence with the common European forms.

⁹³ Holmes (1903: 130) rejected the sporadic reports of kilns in the Southeast.

⁸⁸ Cf. also Holmes (1889: 249-250).

⁸⁹ Cf. also Mason (1887).

⁹⁰ For illustrations of Pamunkey specimens (collected by Dalrymple about 1878 (Holmes, 1903: 152)), cf. Holmes (1903: pl. CXXXVI), in which analogies with Catawba forms may be seen in the two plain bowls (front row, left and center) and the three(?)-footed mug (rear row, center, shown with a separate bowl reposing within its mouth).

⁹¹ Here, however, it is also stated that the Pamunkey "still make a few earthen pipes, some of which are of old form and all of which, I understand, are made by old time method to a great degree."

⁹² Vessels and pipes illustrated in his figures 108 ff.

Here then is the secret, and, comparing this material with the historic Pamunkey ware, we are forced to conclude that the later archaeological material is transitional, forming the link between the pre-European and modern potter.⁹⁴

In his further comments, Speck states (1928: 424-425):

The modern Pamunkey have not quite left off making pipes. Some of the women . . . and some of the men . . . manufacture them as they were made two generations ago. They dig their clay in the same holes along the river. They gather and burn the mussel shells, and clean and mix the clay with the powdered shell in the same proportion, about one part of shell to five of clay. They burn them in the traditional way by piling a heap of dry fine sticks and a dozen or so dry cornstalks to the height of five or six inches, enough to cover two or three pipes which have been four or five days in the shade. Then when one covering of the sticks has been burnt off, the pipes are done and ready for use.

Pottery-making among the Pamunkey appears to have received a fresh impetus during the last decade. At the present time vessels and pipes are being manufactured primarily for tourist trade. The potters use—quite unsuccessfully, I think—painting and crustation (*i. e.*, pre-fired as well as post-fired applications of the color medium) for decoration; and they often employ a kiln for firing. That some aboriginal Southeastern methods still prevail at Pamunkey has been shown by the recent field work of Mr. Theodore Stern, a graduate student in anthropology at the University of Pennsylvania. Mr. Stern devoted several field trips in 1940 and 1941 to a study of pottery-making at Pamunkey, working chiefly with Paul Miles, the most active native potter. The results of his work have been embodied in an unpublished manuscript (1941)⁹⁵ placed in the Library of the University of Pennsylvania. The paragraph immediately following this is based on that manuscript and on various personal information given me by Mr. Stern.

At the present, two styles of pottery-making exist at Pamunkey; one follows native tradition, while the other is taught at the pottery school maintained on the reservation by the state since

1932. The traditional procedure may be outlined briefly as follows. Local clay, recognized as tribal property, is utilized, invariably tempered with calcined mussel shells in varying proportions up to one-third by volume. The constructional methods employ modeling, segmental procedure with morsels and with fillets, and molding. The morsel variant depends on amorphous increments of paste which are gradually added to the growing wall, starting with a previously modeled basal disk. The segmental fillet-building depends upon the circuit variant of annular procedure. (The principle is the same as that practiced at Catawba.) A double mold is used in the production of certain pipes, but more commonly pipes are modeled. The polishing pebble, especially valued and often quite old, is usually kept in active service through family inheritance. An impressive variety of decoration is generally executed; sundry impressions, rubbing, brushing, indenting, grooving, incising, etc., produce the desired effects. However, attempts at painting, presumably aiming to imitate Pueblo examples, have been, I think, totally unsuccessful. The firing of larger pieces is usually done at an open fire outdoors. Pipes are fired either in a metal receptacle or upon the grate of a kitchen stove. The traditional style has been flourishing for over a decade, and has retained its methods and improved its technique in most recent years. The school, at first adopting the circuit construction and using local clay, soon introduced radical innovations. Stern lists pot-molds, use of sand for temper, utilization of untempered clay, importation of factory clay, the potter's wheel, templates, paints, glazes, and the kiln. The influence on form is therefore pronounced, and reflects not only the new mechanical facilities, but also the pressure of tourist demand. The school promotes imitations of Pueblo shapes and decorations, and the first instructor is credited with the introduction of decorative pictographs purporting to represent Indian sign language. The school-taught style of pottery-making no longer retains any native Pamunkey methods, but it apparently does not usurp the local craft. At the same time its economic advantage is certainly of distinct importance.

Compared with the product of the Catawba (or its counterpart at Cherokee), the native Pamunkey ware is marked by a gross qualitative inferiority. There is historic proof and some extant evidence of certain influences brought in by Catawba potters marrying among the Pamun-

⁹⁴ At Catawba flat bottoms seem to be an aboriginal characteristic. However, Speck's relegation of this type of base in the Virginia-Maryland-Delaware coastal area to post-European contacts remains unchallenged.

⁹⁵ Mr. Stern obliged me with a copy of his manuscript, and gave me detailed verbal accounts of his several field trips. I hereby acknowledge his courtesy in allowing me to use his data in this paper.

key. In modern times, however, such instances have just about disappeared. The Pamunkey who still follow the native traditional methods obviously lack the skill, and perhaps also the zest, which is so characteristic of the Catawba potters. Their products seem devoid of any special care, finesse, and enthusiasm. While the techniques still preserve certain aboriginal principles, the finished products do not reveal them. Even an expert in native American Indian pottery-making, past or present, might well be perplexed by some of the modern "traditional" Pamunkey product. The tourist trade seems to be chiefly responsible for the current state of the Pamunkey craft. Despite the relatively low pecuniary gain—in contrast with Cherokee and Catawba—the economic aspect is stronger than the force of tradition. Nevertheless, the school should be able to work out a program which would serve to retain and improve the traditional style and at the same time to enable others to better their economic status through industrialized pottery-making. Such a program should avoid combining the two tendencies, for each has its specific scope, and each can satisfy the relevant demand.

After the foregoing brief survey of pottery-making at Pamunkey, it seems appropriate to inquire into the status of the craft among the neighboring remnants of Indian descendants in Virginia.

About 1925 Dr. Speck collected a plain, spheroid, fairly smooth, and undecorated jar of Chickahominy provenience, about four inches high and about five inches in diameter, recently made in the family of Chief O. W. Adkins.⁹⁶ The Chickahominy might still find it possible to demonstrate pottery-making reflecting some formerly used methods.

A similar supposition is probably also applicable to the Mattaponi and to the Adamstown or Upper Mattaponi. Only field investigations can determine the actual conditions; certain sporadic information seems to indicate that at least traditional knowledge of pottery-making may be expected.

According to Speck (1925: 69), "pipe making and ceramics, it seems, passed out of existence among the Rappahannock before the Civil War. . . . It is indeed unfortunate that some vestiges of clay-working did not continue until a later day, at least in memory, as they have among the Pamunkey and Mattaponi." For the Rappa-

⁹⁶ Information from Dr. Speck. For an illustration of the specimen, cf. Speck (1928: fig. 113).

hannock, then, it would seem less possible to entertain such hopes as one may, albeit reservedly, for some of their consanguineous and culturally akin neighbors. And yet fresh field investigation of the question is desirable before final judgment is passed.

For the mixed descendants of the Namsamond, Potomac, Powhatan, and (?) Werewecomoco, now surviving in Virginia "in the same general locality where their ancestors lived" (Speck, 1925: vii), no positive records or traditions of pottery-making, past or present, have, as far as I am able to ascertain, been gathered.

In the Chesapeake region farther north, native pottery-making did not survive into modern times either in practice or in tradition.

In his monograph on the Nanticoke of Delaware, Speck (1914: 36-37), dealing with local archaeology, did not specifically mention the "smooth ware" simply because its general occurrence in the area was not then established. This, however, was done in subsequent years, and Speck (1928: 412, 424) was the first to report and to evaluate the culture-historic importance of such pottery.

More recently Davidson (1935: 6 ff.) reported the finds from the Slaughter Creek site, Delaware; his excavations brought forth, among other remains, undecorated sherds with crushed shell inclusions, *i. e.*, Speck's "smooth ware."⁹⁷ It is to be hoped that further systematic work in Delaware will follow, and that it may reveal evidence with which to reconstruct local chronology. Similar investigations are also desirable in Maryland. An attempt to establish the temporal position of the flat bottom, and above all the chronological relation of the "smooth ware," must necessarily wait for dependable archaeological evidence.

SOME HISTORICAL RETROSPECTS

In the deeper Southeast, pottery-making appears to have been abandoned during the nineteenth century⁹⁸ by the Chickasaw,⁹⁹ Chiti-

⁹⁷ Dr. Davidson informs me that he did not find any flat bottoms.

⁹⁸ Accurate dates are, quite naturally, extremely difficult to ascertain. The Caddo, not included here in this relation, may have made pottery as late as the nineteenth century. However, direct evidence seems to be absent in relevant documentary sources. Nor does one find any alleviating data in records devoted to the various known tribal components of the Caddo nation. Ford (1936: 72 ff.) deals with historic Caddo pottery; his dates go back to the seventeenth and eighteenth centuries. In a similar

macha,¹⁰⁰ Choctaw,¹⁰¹ Koasati,¹⁰² Natchez,¹⁰³ Pascagoula,¹⁰⁴ Seminole,¹⁰⁵ and Tunica.¹⁰⁶ Details of technique and other aspects comparable

manner Ford (1936: 40 ff., 72 ff., and 98 ff.) considers the case of the Choctaw, Natchez, and Tunica. Fairly accurate dates on the termination of the potter's craft among these three peoples are available; *vide infra*.

⁹⁹ Holmes (1903: 130), *i. e.*, "if the labeling of certain specimens in the National Museum is correct."

¹⁰⁰ Swanton (1911: 347): "Pottery continued to be made [according to the author's Chitimacha informant] until about eighty years ago." Especially significant is Swanton's remark: "The important part played by a monster pot in the [Chitimacha] flood legend indicates that the art was an old one among these people." The recollection of the absence of tempering material and of the exclusive employment of fingers on the interior of the vessel revealed by Swanton's informant is indeed interesting and valuable.

¹⁰¹ *Cf.* Holmes (1903: 130), with the qualification regarding the National Museum labels; also p. 102. Swanton (1931: 40) states: "We have no information from early writers regarding their [Choctaw] pottery except the mere fact that they had it." Bushnell (1909: 13): "Pottery bowls are no longer made, although they are remembered by the living [Choctaw] Indians who recall having seen bowls provided with three small feet; consequently bowls must have been in use only a short time ago." The account of Butel-Dumont (1753, 1: 154; 2: 271 ff.), dealing with eighteenth century Louisiana potters, was considered by Mason (1911: 105) as applying to the Choctaw, without an explanation of the view; however, Swanton (1931: 62) regards it, with convincing deductions, as an observation made among the Natchez.

¹⁰² Harrington (1908a: 406).

¹⁰³ The Natchez probably made pottery as late as the nineteenth century (*cf.* Swanton, 1911: 81). The account of Butel-Dumont (1753) and that of Du Pratz (1758, 1: 124; 2: 178-179) seem to be the earliest and at once the best available, even if deplorably incomplete, records on the subject. The use of color (Du Pratz, 1758, 1: 124), presumably for monochrome painting, and the manufacture of figurines used in temples (Swanton, 1911: 159 ff.), bespeak an originally well-rooted pottery industry among the Natchez; Holmes (1903: 102) spoke specifically of the high status of the Natchez arts and industries.

¹⁰⁴ Swanton (1911: 303), quoting Margry: "They have plates made of wood and others of earthenware; they are all very well made, although by the hand of savages. The women of the savages also make large earthen pots, almost like big kettles, which hold perhaps forty pints, in which they have their hominy cooked for two or three families. . . . These pots are of clay (*terre grasse*) and of a round shape, almost like wind-mills." The form comparison has a multiple suggestive value; I venture to consider the possibility of the shape illustrated in Holmes (1903: pl. LV1a—specimen from Bear Point mound, Alabama, p. 106), which, however, resembles the body of a modern churn as well.

¹⁰⁵ Holmes (1903: 130), *i. e.*, "if the labeling of certain specimens in the National Museum is correct."

¹⁰⁶ Swanton (1911: 315, 319), quoting Gravier: "Earthenware pots, quite well made, especially little glazed [?] pitchers, as neat as you would see in France." "Little earthen pots . . . used for religious purposes."

to Catawba practices appear originally to have been possessed by the Chitimacha,¹⁰⁷ Choctaw,¹⁰⁸ and Natchez.¹⁰⁹ In the case of the Choctaw, moreover, there seems to be a parallel in the esoteric peculiarity of the imposed restriction regarding the witnessing of the firing process (Bushnell, 1909: 13). According to Holmes (1903: 143), "one specimen in the U. S. National Museum labeled 'Seminole' is identical with Catawba ware."

The technique of eighteenth century Louisiana potters, as presented by Du Pratz (1758, 1: 124; 2: 178 ff.) and by Butel-Dumont (1753, 1: 154; 2: 271 ff.), allows little comparison with the Catawba.¹¹⁰ Notable exceptions exist in two points specifically brought out by Du Pratz (1758, 2: 179): the use of a polishing pebble and its careful preservation during migrational movements; and the removal of constituent sand from the clay used for paste.¹¹¹ Butel-Dumont's account (1653, 2: 271) of coiling with fillets "six or seven feet in length,"¹¹² seems to be without parallel in the Southeast. Speaking of Ewi Katalsta, who appears to have been the last native Cherokee potter to use coiling, Holmes (1903: 57) compared her true coiling method

¹⁰⁷ *E. g.*, the "peculiar pipe, into which a number of stems could be inserted" (Swanton (1911: 349)). This is strongly suggestive of the Catawba "peace pipe."

¹⁰⁸ *E. g.*, the three-footed vessel, the use of grease on freshly fired specimens, the absence of temper in paste for pipes, the incised decoration, and the lustrous finish (*cf.* Bushnell, 1909: 12-13).

¹⁰⁹ *E. g.*, greasing of vessels after firing (personal information from Dr. Swanton). The sporadic cases of burnt, crushed bone tempering medium, noted in a few sherds collected at Catawba, must be viewed with reserve.

¹¹⁰ Holmes (1903: 57, 102) qualified both of these instances as "inadequately described," yet considered them to be "brief but valuable records of the practice of the art in this section." "But," he added, "we are not definitely informed which of the various people were referred to in their accounts." As already pointed out, Swanton assigned the two sources to the Natchez, while Mason considered Butel-Dumont's description as applicable to the Choctaw. Extremely interesting and important, I think, is Butel-Dumont's record (1753, 2: 271 ff.) of true coiling, which, as far as I am aware, is the historically first notation of this method in the Southeast.

¹¹¹ It is of further interest to note the reference to the use of a "*bois plat*" upon which the women worked. The flat wooden surface may, quite conceivably, have had some effect upon the plane of the bottom, possibly a flattening one. On this point Du Pratz is silent; it seems well, however, to recall the flat base in ancient Catawba pottery.

¹¹² A single fillet of such length would be very difficult to prepare and to manipulate. Perhaps the author had in mind the computed measurement of several fillets used in the construction of a given vessel.

with that of the "potters of Louisiana," but gave no tribal names. One is led to the inference that Holmes (1903: 57) here relied on the work of Butel-Dumont, which he excerpted at length in translation.¹¹³

For the modern Yuchi in Oklahoma, formerly of the Southeast, there is Speck's ethnological study (1909) from which the following quotations on pottery-making are germane to the present purpose: "The clay is washed to reject grit . . . the lengths or sticks of rolled clay are coiled around on . . . the . . . base and so built up until the proper height and form is obtained" (pp. 25 ff.).¹¹⁴ The scraping with the edge of a mussel shell, rubbing and polishing, the manner of progressive firing (with frequent turning), the rejection of the grit, the preparation of the base disk, and the exclusively female operators (in the manufacture of vessels) (pp. 25 ff.) parallel the Catawba practices. According to Speck (p. 28), the modern Yuchi vessels resemble more the Chesapeake-Potomac group than "they do the highly ornamented and complex forms of the Southern Appalachian groups." The pipes, still made by men, and of the same paste as the pots, are hand modeled; plain and effigy forms are common (pp. 28 ff.). Here too, then, in certain points of technique, and in the plain shapes, a comparison with Catawba pipes can be drawn.¹¹⁵

CONCLUDING REMARKS AND COMMENTS

With the Catawba, pottery-making not only survives along traditional lines, but is quite commonly practiced. With the exception of changes in the form, modern influences are negligible¹¹⁶

¹¹³ He also gave a similar treatment of Du Pratz's publication.

¹¹⁴ I am obliged to Dr. Speck for the following additional information. The rolls were of irregular length, yet applied in the manner of the Catawba circuit procedure. The Yuchi were no longer making pots by 1908, *i. e.*, the date of his study here quoted.

¹¹⁵ It is interesting to note the survival tendency in pipe-making in contrast to that of pots. This already has been shown to be true of the Pamunkey and the Choctaw.

¹¹⁶ *Cf.* Holmes (1903: 143): "But an examination of numerous ancient sites and a number of mounds in the region occupied by the Catawba in early historic times, yields forms of vessels distinctly western in some of their features [this is *à propos* of Western and Eastern Siouan comparisons], and in cases there appear also pretty well-defined characteristics of the historic Catawba work. . . . Specimens found on the older dwelling sites of the people resemble the modern pottery in color and finish, but they are of better workmanship, and the shapes resemble less closely those of the whites. All are flat-bottomed, have

and readily distinguishable. The most recent accomplishments are permeated with the same elements of techniques which were current at the reservation in the eighties.¹¹⁷ These were rooted then—although minimized by Holmes (1903: 143)—as they are now, in aboriginal antecedents. It must be stressed again that Holmes wrote about the Catawba potters on the basis of Palmer's and Mooney's records, and from examination of museum specimens, rather than from actual field observation. That probably explains his failure to grasp the technique in the light of then existing conditions and retrospective values.

An impressive continuity of basically native forms amid modern Catawba ware is demonstrable from extant collections, and is also supported by certain archaeological comparisons. I realize, of course, that the "ancient" evidence is not adequately datable to permit far-reaching retrospective reconstruction of a chronological value. The inherent limitations, in view of the existing deficiencies, are obvious. My deductions in this respect, therefore, are not necessarily applicable to the pre-Columbian time scale. Nevertheless, it is significant to note that the various samples of archaeological material found in sites within the Catawba territory show germane similarities to the modern product, and that they apply alike to form, textural quality, surfacing, firing, and constructional technique (*i. e.*, annular building).

It remains for future archaeological investigation to ascertain the history of Catawba pottery-making as an integral part of their material culture. So far as the past is concerned, it is evident that ample material remains exist in the hitherto very little explored sites in the Catawba locus. Naturally, an archaeological reconstruction must arise from such tangible evidence as may justify retrospective interpretations. Although pottery in itself is not adequate, nor exclusively dependable for this task, it seems reasonably presumable that a study of the existing collections, and especially fresh field work, should establish a comprehensive index with which an objective plan may be formulated.

It is well known that at the present time the archaeological history of the Catawba remains virtually untouched. Yet it is clear that the contemporary pottery of this people discloses the thick walls and peculiar color and polish of modern Catawba ware, and are well within the Catawba habitat, even if not from sites inhabited by them in historic times."

¹¹⁷ *Cf.* Palmer's observation of 1884, incorporated in Holmes (1903: 55), and those of Mooney, also published therein (*ibid.*: 53 ff.).

many characteristics of the ware gathered at sites which are attributable, either traditionally or through sources, to former Catawba occupation.¹¹⁸ The manufacturing techniques of the two categories of ware are almost identical. Analyses of the history of yet other elements characteristic of the cultural attainments of the Catawba seem plausible of accomplishment. They should aid in the retrospective tracing of the last remnant of the Eastern Siouan-speaking group. The recent works of Speck (1935) and Swanton (1923, 1935, 1936)¹¹⁹ reveal new evidence of intraregional as well as extraterritorial distribution of Eastern Siouan peoples in aboriginal times.¹²⁰ Toponymy and other linguistic traces indicate their former existence quite far afield from the northern section of South Carolina. Archaeologically, there is as yet very little in the way of adequate light with which to aid in these endeavors in so far as the Catawba are concerned.

The recent archaeological explorations in the Southeast have considerably advanced the understanding of culture historical events in areas lying to the south of the modern Catawba habitat. At the same time, however, a comprehensive regional system of chronology is yet to be formulated.¹²¹ In North Carolina systematic archaeological research began in 1936, while in South Carolina no such effort has yet been made. Turning northward from the Catawba locality, one meets first with a pronounced archaeological lacuna in inland Virginia, where pottery remains have received scanty attention thus far. However, in Tidewater Virginia, at least from the Chickahominy River, and in an area extending northward into Maryland and Delaware, there is the "smooth ware" described by Speck (1928: 399 ff. and especially 412). Its fabric, surface

¹¹⁸ Cf. Speck (1928: 413). As previously stated, the University of North Carolina archaeological survey has recently identified several historic Catawba sites. It was my privilege to examine the material deposited at Chapel Hill through the courtesy of Mr. Joffre L. Coe. The sherds show close resemblances to the modern ware in forms, surface finish, color, the *flat* bottom, and constructional technique.

¹¹⁹ Also Dr. Swanton's personal information; his paper presented at the Annual Meeting of the American Anthropological Association, Andover, Massachusetts, December 29, 1935; and his lecture before the Archaeological Society of New Jersey in Trenton, New Jersey, January 18, 1936.

¹²⁰ Cf. also Bushnell (1934, especially pp. 8-9, and map 4).

¹²¹ Ford and Willey (1941) attempted an interpretative synthesis which clearly indicates the many existing gaps.

finish, and color tally with the comparable examples from the Catawba and Cherokee areas.

In South Carolina, I feel, the logical and perhaps also most promising start toward an understanding of Catawba archaeology should be with the known sites situated in the country of the contemporary, albeit ethnically and culturally changed, congeners. Old collections necessitate careful examination, but, above all, more field work is imperative. The results thus far attained by the University of North Carolina explorations certainly inspire hopeful expectations. The surviving pottery technique and the continuity which so prominently mark the craft of the Catawba should provide valuable aid in future inquiries. The usefulness of pottery in attempts leading to reconstructive studies of culture history is a stimulating factor in the case of the Catawba. However, the investigator will find other material remains equally helpful in the preparation of a repertory (in so far as extant evidence may suffice and permit), with which to comprehend events of the past. Subsequent procedure should apply such data in cognizance of those leads already established by Mooney, Speck, Swanton, and others.

The dangers of entertaining extraterritorial comparisons before the local developments are adequately reconstructed certainly need no elaboration. Yet it seems in point to refer to some of the similarities between modern Catawba and modern Pueblo processes of manufacture. The latter are well known from Guthe's splendid study (1925). In 1929 I sent some Catawba specimens to the Museum of Anthropology at the University of Michigan and supplied a brief description of the technique. Dr. Guthe's letter to me, dated March 8, 1929, confirmed several similarities. With Dr. Guthe's permission, I am now able to quote his comment as rewritten by him for this purpose:

The similarity of Catawban pottery making to the method used in the Southwest is striking. The steps you have outlined are practically duplicated in the Pueblo area. In building a vessel the strips of clay to be added are shaped as ropes and do not form rings until they have been applied to the vessel. In the Southwest there are usually two additional steps, namely slipping and painting, between your seventh [drying] and eighth [firing] steps. Instead of using the domestic fireplace as the source of the heat, the Pueblo people build an oven of dung cakes, which are used as fuel, and the firing is done out of doors. The irregular black spots would be explained in the Southwest as a result of contact between the vessel and

some object, such as dung or wood, which would cause a deposit of carbon. The Pueblo potters secure their beautiful black ware by smothering the oven and the vessels within it immediately after firing, with a quantity of new, pulverized fuel obtained by crushing dung cakes. This process is closely similar to that which you mention. The method of inserting handles is the same as that used in making horizontal loop handles in the Southwest. I do not know of any cases of moulds being used among the Pueblo Indians.

Pottery-making at Catawba is demonstrably an old cultural heritage propagated by a conscious evaluation of its economic expedience and importance. While its domestic utilitarian function has diminished with the substitution of modern metal utensils, the ware is produced not merely for the sake of profit. The element of the potter's satisfaction with her skill and the aesthetic feeling derived from her endeavors are likewise prominent factors. The artisan certainly taxes her individuality, and a meticulous care governs the manufacturing process. Patience, dexterity, prudence, and gratification are responsible for the final product which reflects artistic as well as utilitarian values.

It is evident that the individual potter knows little or nothing of the principles of chemistry and physics which inevitably play important roles in the various manufacturing processes. Yet it is equally true that some of the properties and changes which may be attributed to such principles are recognized and respected through the teaching of experience. Questioning on the part of the inquiring observer may not always bring satisfactory answers; the artisan, however obliging, often wonders why "obvious" matters should call for elucidation. Whether the final product represents a sophisticated vase form, a set of bookends, or an ash tray, its appearance and quality are of the same nature as the general run of the purely native-inspired pieces. The color, lustre, and the mottled effect, which render the Catawba ware so characteristically individual and recognizable, are constantly present.

It seems, then, that despite wholly artificial outside forces, which have been especially prominent since contact with the whites, the potter's craft of the Catawba is being conservatively perpetuated¹²² in consequence of the two basic factors responsible for its existence: the supply and quality of the necessary clays, and the custom-

¹²² Mooney (1894: 74), referring to the Catawba reservation population in the year 1889, wrote: "The women still retain their old reputation as expert potters."

taught technique. So long as these two conditions persist at the reservation, the continuity of the craft as it now exists should prevail. The craft is now rather static, although quite lively; a similar status was noted over fifty years ago.¹²³ Certainly, the old masters, whose pride and dexterity are respected by their pupils, show an ardent desire to preserve the standards by imparting their knowledge and experience to the younger generation. Catawba pottery-making, a common possession of the "nation," illustrates an interesting case of cultural continuity which demonstrates the role of a direct traditional survival. Furthermore, Catawba potters married among the Cherokee¹²⁴ appear to have consistently preserved their own techniques. And they instructed local talent in such manner that the contemporary Cherokee craft is now dominated by Catawba practices.¹²⁵

It will be recalled that Holmes (1903: 143) depended largely on the criterion of form in so far as he concerned himself with historical retrospects of Catawba pottery. Yet, as already quoted, he recognized certain comparisons of the product of the historic Catawba in archaeological sites within their early historic habitat. It is difficult, therefore, to appreciate his comment (1903: 143): "The modern Catawban pottery has been so modified by post-Columbian conditions that few of the original characteristics are left, and comparison is fruitless." I have stressed the point that modern commercial influences appear to have affected only the *form* of Catawba pottery, and that "ancient" forms are still currently produced. With respect to technique, no appreciable differences exist between the two categories of ware. Unfortunately, the designa-

¹²³ Palmer visited the Catawba in 1884, at which time he took notes on their pottery-making and later tendered them to the National Museum (*cf.* Holmes, 1903: 55). Historically, this appears to be the first record of the Catawba craft. Holmes's account contains excerpts from Palmer's work; the technical details tally with my observations, but there are no interpretative comments. I have not examined Dr. Palmer's original field notes to be able to state their full nature. The notes, according to Holmes, should be in the National Museum; my attempts to consult them in Washington were unsuccessful.

¹²⁴ First noted by Mooney (1900: 165) and Holmes (1903: 53). (Not mentioned by Harrington.) According to Speck (1913: 330), "half dozen or so persons of Catawba blood . . . were, in 1913 . . . living and mixed with the Cherokee." Two of these were women practicing pottery-making in the Catawba tradition (information from Dr. Speck).

¹²⁵ *Cf.*, in this connection, the cases of Susan Owl and Ewi Katalsta (*supra*).

tion "ancient" has no satisfactory connotation, in as much as the pottery of the Catawba is still unsubstantiated in point of chronology. Nonetheless, it seems significant that an impressive degree of continuity is definitely suggested by the known meager, but positive, evidence.

The cultural and temporal position of Catawba pottery-making offers an important and promising subject of research. The chief needs toward further appreciation, understanding, and interpretation of the subject, seem to be the following:

1. Elucidation of certain phenomena of the firing process whereby certain mottled effects are attained.

2. Investigation of the question of historical priority of the ring variant as against the circuit variant of annular construction.

3. Study of all material remains from former Catawba sites.

4. Formulation of a comprehensive index arising from (3), with which to reconstruct, so far as is possible, the totality of the former cultural expression of the Catawba.

5. Reconstruction of chronological sequence and formulation of analogies with adjacent regions in order to establish relative dating.

The technicalities presented here are based on tangible evidence; and the interpretative data rest on observations and inquiries gathered in the field. If I have failed, in this brief presentation, to justify every reasoning, the fault may well inhere in my incomplete understanding of certain aspects of Catawba pottery-making. To deal with the contemporary craft is simple enough, since recourse to inductive means is available. So far as past events are concerned, the difficulties increase the more one projects one's aims into antiquity. Examination of literary sources dealing with the Catawba reveals a striking similarity with the contemporary fundamentals underlying the individual processes. The ring building variant, however, does stand out as a signal exception; but it by no means appears to be a very recent phenomenon.

Purely archaeological considerations of Catawba pottery-making suffer from serious shortcomings, among which the lack of appropriate exploration and adequate appraisal of extant remains are particularly acute. Consequently, retrospective contentions must provisionally rest on rather uncertain premises; yet such knowledge as can be applied with a reasonable margin of

assurance proffers at least some stimulating support.

The mosaic which I have here attempted to conjure up is certainly neither complete nor adequately balanced. Its very foundation is distorted owing to the pronounced lack of uniformity in historical perspective, and the individual components plainly reflect unequal values. The endeavors and results here described are tantamount to no more than a mere scanning of the horizon, and the potential opportunities are certainly not exhausted. Yet it is to be hoped that this paper may be of some service in further investigations in the northern periphery of the Southeast. I firmly believe that Catawba pottery-making, recent and ancient, furnishes a substantial part-basis for a point of departure toward a broader appreciation, understanding, and interpretation of the culture history of this important area.

ADDENDUM: COILING

The motivation for this note on coiling inhaled in a dilemma which faced me in considering the choice of a suitable term for the Catawba ring variant of annular construction. In my early field notes, and for some time thereafter, I called the process "pseudo-coiling." My search in literary sources dealing with the North American field failed to reveal a parallel phenomenon;¹²⁶ but I did notice that "ring building" was equated with "coiling." That led me to investigate "coiling" more in detail, and I noted yet other definitions such as "moulding," "strip building," "adding circles," "pressing or coiling process," etc. Eventually I decided to call the aforementioned Catawba variant exactly what it is, *i. e.*, ring building, and to submit the so-called "coiling" to a scrutiny. The result is the present discourse, and its purpose is to reveal the laxity in description (if not in concept) of the process, to indicate the untenable looseness in terminology, and to outline a classificational grouping of the various methods of fillet construction.

Of the several variants of pottery construction, the process called "coiling" is most frequently found—in *literature*. Whether directly stipulated as such, or merely inferred, the term is rarely applied without ambiguity. Obviously, coiling denotes a building process and must not be confused with other steps of pottery manu-

¹²⁶ Thompson (1930: 95) reports the occurrence of true ring building among the modern Maya potters at San Antonio, British Honduras.

facture, even if its function be an aid in such aspects as form-giving (shaping) or embellishment. Sources on pottery technique are quite devoid of a standard definition of the phenomenon and its distinguishing criteria. Although "coiling" is often explicitly contrasted with other means of constructional procedure, considerable confusion exists in terminology and in classificatory segregation. It cannot be said that the term "coiling" connotes a recognized inclusive designation, *i. e.*, that it embraces all varieties of pottery construction which depend on the use of paste in the form of a fillet ("rope," "rod," "strip," "coil"). On the contrary, the customary reference to "coiling" lends itself, as a rule, to one of two interpretations:

1. Continuous operation with a single fillet or with several individual fillets, successively connected and forming a spiral.
2. Construction with the use of several fillets, progressively applied, and individually bonded, but not successively linked.

These modes comprise perhaps the most commonly recognized variations. They are, however, rooted in quite different principles. The first depends on carrying the paste medium around in the manner of a superimposed spiral regardless of the actual number of fillets employed. The other involves concentrically placed individual fillets; this is illustrated by the circuit and ring variants of the Catawba.

Lexically, the word coiling fails to provide a satisfactory denomination. Its etymology is quite unclear, its meaning ambiguous; as injected into pottery terminology, it reflects ill-chosen borrowing. Dissatisfaction with so loose a term has often been voiced or implied; yet the catachresis continues. In view of the circumstance that the word "coiling" is so thoroughly implanted in American literature, and especially by reason of its application to prehistoric Pueblo pottery by Holmes (1886: 257 ff.), it would seem futile to consider a substitute. However unpalatable the misnomer may seem, it does carry a connotation which is objectively measurable; its chief criteria can be stipulated with precision and clearly defined. It may be useful to choose a collective term under which to include coiling, circuit procedure, and ring procedure; *fillet building* seems to serve the purpose.

For the present needs I am guided by the following understanding of coiling in the potter's craft: Coiling implies a building process which is

accomplished either with a single fillet (apparently a rare phenomenon) or with a series of fillets successively connected to constitute a continuous chain. In either case the paste medium is fashioned first, and its application depends on a purely manual manipulation in which the potter's hands must be free to effect the placement and bonding. The fillet, single or chained, is carried on spirally, and in such manner that each loop (irrespective of the shape of its course) is equivalent to the circumference of the wall under construction at a given height. However, the fillet itself does not terminate as it completes the circumference, rather it is carried on into the subsequent revolution. Owing to the unavoidable overlapping which results from the continuous course of the fillet (single or chained), the plane of a given loop is necessarily an uneven one and often slanted. Whether the construction begins with or without a previously fashioned base (bottom), and whether the fillets are completely obliterated or not, coiling inevitably involves unbroken linkage in carrying the paste medium around on a spiral course. When the operator begins by coiling the base (bottom) first, that process entails convolute coiling; the fillet is then carried around plano-spirally, and the manipulation constructs a more or less flattened disk. A similar base (bottom) may be procured by modeling, *i. e.*, by direct shaping in hands (combined, perhaps, with an impact on a planed, solid surface); or it may be achieved by pressing the paste within or upon a shape-giving contrivance (sherd, pot, basket, weighted bag, etc.), *i. e.*, a pseudo-mold (as distinguished from a true mold within which or upon which to produce a vessel, figurine, appliqué ornament, pipe, lug, handle, etc.) With the convolute, base-producing variant, the wall-erecting process continues without interruption. On the other hand, a previously modeled base

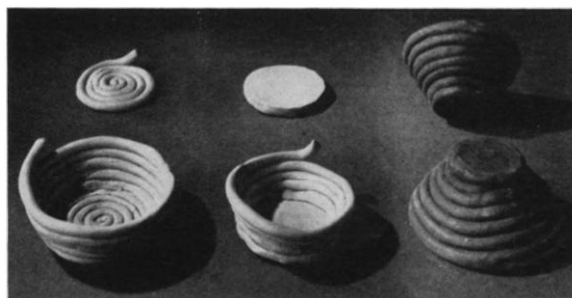


FIG. 32. Over-all coiling (left); coiling the sides upon a flat base (center); and vessel with coiling completed (right).

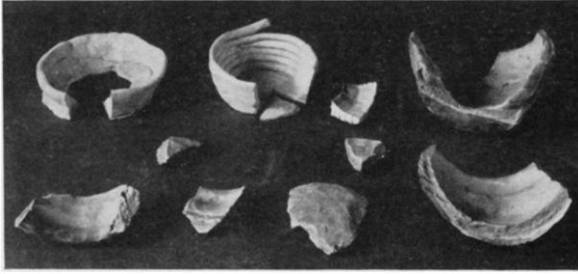


FIG. 33. Dried and fired pieces, broken to show methods of construction.

(bottom) delays coiling until the wall itself is begun. The fillet (single or chained) is then carried in the manner of a vertically superimposed (or perhaps juxtaposed) spiral. For, having completed the course necessary for fully describing the requisite circumference, the fillet is not terminated (by bonding its margin, or by breaking off the surplus length), but is retained as an integral part of the subsequent loop (or loops). In other words, the fillet (single or chained) is retained beyond the length equivalent to the circumference of the wall, and the potter proceeds with construction by carrying, from volution to volution, the appropriately fashioned medium of paste throughout the coiling operation. When convolute procedure is turned into a spirally wound course, a case of over-all coiling obtains; otherwise a combination of coiling and another method (or methods) is at play. Imbrication, although common, is not necessarily an index characteristic of coiling. Coiling leads to the construction of either a blank (subject to separate shaping) or an essentially final form. In the former case the shaping of the desired form becomes an entirely separate task which is, of course, independent of the constructional steps. The form-giving manipulation, accomplished either purely manually or with tools (anvil, paddle, spatula, spoon, trowel, etc.), is fully detached from coiling. (It is inconceivable to “coil with an anvil, paddle, stick,” etc.) It is plausible, of course, to produce embellishment concurrently with coiling. This may consist of seams, overlaps, protuberances, indentions, corrugation. (Corrugation, a specialized tecto-decorative process, logically necessitates concurrent form-giving.)

Viewed in the tecto-functional sense of its implications, coiling proper is distinguished by an ample number of characteristics. Naturally, these characteristics are not constant; nor need

they always occur in like combination. However, those which invariably do distinguish a case of coiling as such, are sufficiently well pronounced to warrant—indeed to compel—differentiation from other fillet-using processes. And, quite conceivably, a potter may, in accordance with certain conditions, combine two or more modes of construction in the course of erecting a single vessel.

In the Southwest, it is commonly alleged that Pueblo pottery was made by “coiling,” while the Hohokam ware, *in contrast*, was made by “the paddle and anvil method” (*cf.* V. J. Fewkes, 1941*b*). Roberts’ initial attempt (1935: 20) to dispel this popular confusion appears to have gone unheeded, perhaps chiefly because of the casual manner in which it was voiced.¹²⁷ Gifford (1935) obviously missed his opportunity in commenting on the praiseworthy effort of Roberts, by failing to elaborate the fundamentally different functions of “coiling” on the one hand and of “the paddle and anvil method” on the other hand.¹²⁸ However, Roberts appropriately reiterated his warning when, comparing Hohokam and Anasazi wares, he stated (1937: 20):

The pottery made by the two patterns differed in certain respects. Both groups used the coiling method but the finishing process varied. The Anasazi smoothed the surface of their pots with scrapers and polishing stones; the Hohokam completed theirs by employing a paddle and anvil.

“Coiling,” or rather *fillet building*, as applicable to pottery, connotes a constructional process which, by virtue of logic as well as of physical law, unconditionally requires manual manipulation. The potter’s hands simply must be free for the handling, placement, adjustment, and bonding of the fillets. The use of the paddle and anvil leads to deliberate alteration of either a partially or a completely built, fully plastic, embryonic vessel. Such alteration may involve: thinning of wall; compacting of paste; bonding of tectonic segments; obliteration of junctions;

¹²⁷ *Cf.* also Roberts (1936: 527) for a somewhat revised version.

¹²⁸ I shall have occasion to refer later to Gifford’s paper of 1928, which deals with the “two methods” in question. Yet it seems well, in this connection, to recall that he recognized (1928: 353) “two methods of *making coiled* pottery . . . in the Southwest.” “The principal criterion of method,” continued Gifford, “is the use or non-use of a wooden paddle and a stone or pottery anvil in *shaping* the vessel.” (Italics in these quotations are by the present writer.) The fallacy is self-evident; it was simply restated by Gifford (1935).

smoothing of surface; shaping of final form.¹²⁹ However, no matter what the ultimate effect may be, the paddle and anvil, either in their dual role or independently, cannot, again by virtue of logic and of physical law, be utilized as an aid to the constructional process proper. Yet it is conceivable that bonding and adjustment of fillets might, if desired, be accomplished with the use of a paddle, stick, anvil, etc., although these processes are most commonly achieved by plain hands. In any event, the manipulation of the paste segment, as it enters the building process, indispensably requires that the potter's hands be free. And once the paste becomes a tectonic component of the growing vessel, its subsequent alteration, no matter how attained, no longer constitutes construction. It is, therefore, a methodological error either to compare or to contrast "coiling" with the use of "the paddle and anvil," for the two are rooted in different technological principles (*cf.* V. J. Fewkes, 1938: 197). Perhaps the circumstance that considerable laxity has existed in constructional terminology contributed to the general confusion just considered; but the fact cannot be minimized that authors have often failed to be explicit in presenting their data. (*Vide infra.*)

A limited number of citations, all but one applying to the Americas, is here assembled as documentary evidence. The comments must not be construed as aiming at criticism, but rather as a means toward illustrating the urgent need—as I see it—of precise distinctions. I may add that I am fully aware of the limitations inherent in an attempt to reconstruct pottery technique from fragmentary fabrics (*i. e.*, fired pieces); naturally, indubitable criteria can best be illustrated from extant practices of pottery-making. Moreover, *I am concerned primarily with the fillet-using processes*; for this reason I shall mention other means of construction only in support of the distinction between the technicalities falling within the scope of my task. It becomes necessary, of course, to extend this inquiry beyond the limits of the Southeast.¹³⁰ Admit-

¹²⁹ Incidentally, the various possibilities of using the paddle and anvil render the alleged "diagnostic marks of the method" of doubtful value indeed.

¹³⁰ In the Southeast apparently only the Natchez, as observed by Butel-Dumont (1753, 2: 271 ff.) (tribal identification after Swanton, 1911), employed the single fillet (alleged length six to seven feet) process, beginning, it seems, with coiling the base (bottom) first.

The Cherokee, as has been shown, practiced coiling by linked fillets, but proceeded upon a previously modeled

tedly, no pretense of an exhaustive treatment is here maintained. Although I have deliberately restricted my inquiries to North America (with very few references to Middle and South America), the present discourse aims at a sampling rather than at a thorough treatise. Such aspects as time and space, historical perspective and correlation, as well as specific cultural considerations, are quite outside the scope of the task at hand. My endeavors at the moment are centered on a description of technicalities revealing sundry criteria of various modes of construction depending on fillets.

It is convenient at this point to deal with the selected citations.¹³¹

Wissler (1938: 69):

As a rule all the New World potters used the coil method, *i. e.*, slender rods of clay were rolled out to convenient lengths and the vessel built up spirally. In some vessels from the Pueblo area the original traces of the coils were retained as decorative motives, but, as a rule, the surfaces were afterwards scraped smooth and to the required thinness.

base-disk. Coiling in ancient Cherokee ware was inferred by Holmes (1903: 163).

During the excavations of the Etowah mounds "bits of coil," "discarded ends," and an example of a "rim finish with a coil" are said to have been found in the deposits (Ashley, 1932: 122 ff.). Ashley also stated (p. 109) concerning the mode of manufacture: "This method [that of the predecessors of the Cherokee], the one most commonly used in the Southeast, was coiling—the building of the side by placing strips of clay in spiral form, a base of the same clay being used as a foundation or nucleus." (Evidently, the linked coiling variant is implied.)

According to Clafin (1931: 19), "There is unmistakable evidence on several of the textile-marked sherds [Stalling's Island Mound, Georgia] that the coiling method of manufacture was in use." (Clafin did not present any elucidation as to the nature of the evidence, nor the manner of construction.)

Among the hitherto unpublished archaeological pottery from the Southeast in the Peabody Museum, Harvard University, I noted repeated examples of coiling by linked fillets, but none by one fillet alone. The specimens were from Georgia, Florida, Alabama, Louisiana, and Tennessee.

Most of the cinerary urns from two burial mounds at Cox, near Darien, Georgia, now in the Irene Mound Collection at Savannah, display ample evidence of all-over coiling by linked fillets. (Unpublished.)

The Southeast is here understood in the sense of the geographical definition given in Speck (1907: 289).

¹³¹ The order in which these citations appear has no particular bearing on the subject. Indeed, it would probably be difficult to arrange a "logical" progression. It will become apparent, however, that some grouping has been reached, in as much as works of a general nature are considered first; sources on the Southwest are arranged in a chronological order; and interpretative compilations appear last.

The "convenient lengths" or "rods" indubitably signify coiling by linkage of individual fillets; and the spirally carried building procedure leaves no doubt as to the principle involved in the construction.¹³²

Linné did not distinguish circuit building from true coiling. To quote from his well-known work (1925: 78–80):

The [coiling] process has too often been described to call for any closer explanation here. In America the vessels are built from the bottom upward, whilst here and there, in other places, the building is commenced from the mouth portion. Frequently cracks occur in the joints between the coils, and the presence of horizontal cracks in primitive pottery is surely satisfactory proof of the technique used.¹³³ . . . The coils are usually the length of the vessel's circumference, each "story" consisting of one roll of clay.¹³⁴ At Cobreas . . . a woman potter made each "story" in three sections, joining each to its neighbor and to a clay roll underneath. The Guató, on the contrary, built up their vessels of a continuous coil, spirally laid on.¹³⁵ . . . It has been mentioned in the foregoing that the coiling method obtains, or has obtained, over the whole American continent.¹³⁶ . . . Terminologically, the word "Spiralwulsttechnik" would not seem particularly well chosen, as, judging from the description given, there is only one tribe, the Guató, who builds in a continuous spiral.¹³⁷ . . . The others, as has been described in the foregoing, by level courses of coils. The method [*i. e.*, true coiling] may possibly have been used in Porto Rico.

And commenting on Schmidt, with reference to pottery technique in the high culture area of the Andes, Linné held (1925: 80–81):

There is hardly any alternative: here [in the Inca region, archaeologically speaking] the technique *must have been* that of coiling.¹³⁸ . . . As has been said before, from time of the discovery of Peru no description exists as to pottery making. Nor have I seen

¹³² With respect to Wissler's contention that all the Amazon tribes had the coiling method, *cf.* the following quotation from Linné.

¹³³ Strictly horizontal "cracks" indicate parallel planes of individual annular fillets, whereas in true coiled pieces a slanted plane is usual.

¹³⁴ This is again proof of circuit building, rather than true coiling.

¹³⁵ Evidently Linné was not without examples of true coiling.

¹³⁶ This is a sweeping statement—in view of the ambiguity of Linné's understanding of the method.

¹³⁷ Farabee (1922: 86 ff.) implied linked coiling for the Conebo and the Sipibo.

¹³⁸ *I. e.*, either true coiling, or annular building? (Italics are those of the present writer.)

vessels published that could be adduced in proof of the presence of the coiling method. In a clay vessel from Huamachuco . . . the building-up coils seem, however, possibly to have been left unfinished.¹³⁹ But Wissler . . . says that it [coiling] was used by the side of shaping by means of a mould, and the same is stated in the case of Ancon. . . . Prof. Uhle, when questioned, stated his *absolute opinion [sic!]* that *all* archaeological Peruvian clay vessels, other than those of the Chimu culture, were made by the coiling method.¹⁴⁰

The inadequacy involved is self-evident.

In distinct contrast to Linné's criticism (1925: 79) of the German term "Spiralwulsttechnik," I consider this nomenclature by far more appropriate and expressive than the English usage of *coiling*. Selecting a remote geographical example for the purpose of illustrating the usefulness of the descriptive value of its connotation, I quote Schurig (1930: 65): "Die Wulsttechnik, baut aus dünnen runden Lehmwülsten, . . . spiralgig gewunden die Gefässe auf." Here, it seems to me, there is no ground for speculation; the spirally carried manner of building, depending on thin fillets, unquestionably linked as the spiral winding signifies, is explicit.

Harrison (1928: 31–32):

Of the building methods . . . one of the processes has not only a striking individuality of its own, but has a wide and interesting distribution. This is the coiling method, especially characteristic of America, but also occurring in . . . widely scattered regions. . . . The characteristic feature is the preliminary preparation of rolls of clay. . . . In the process of shaping the pots *these rolls are coiled spirally upon each other*,¹⁴¹ *the diameter of the spiral—or sometimes the circles*¹⁴²—increasing or diminishing to suit the varying width of the pot¹⁴³ at its different levels . . .

¹³⁹ Perhaps in a manner similar to that shown in Linné (1925: fig. 10).

¹⁴⁰ *Cf.* the warning of Shepard (1936: 440). (Italics are those of the present writer.)

¹⁴¹ *I. e.*, true coiling, accomplished, in this case, by the linkage of several "rolls."

¹⁴² Presumably, such "circles" form individually closed "rolls," each separately terminated upon a horizontal plane either by previously cutting the rolls to a uniform length, or by pinching the ends off as the circuit is completed; whether the ends of these rolls are joined by overlapping, or by simply connecting the meeting termini, the resulting bonding does not disrupt the plane continuity of the horizontally laid circuit. This, then, certainly is not true coiling. (Italics are those of the present writer.)

¹⁴³ *I. e.*, in the case of the form being shaped, provisionally or definitely, simultaneously with the building of the wall; otherwise a cylinder may be built first, its form subsequently altered, and the final shape brought out by a separate manipulation. *Cf.* the practice of the Catawba

it is very rarely that the finished pot shows any signs of its spiral or circular origin;¹⁴⁴ nevertheless, some of the old wares of the Pueblo and other Indians [?] of North America, and the Choroti¹⁴⁵ and others of South America, have the coils left in evidence as the basis of the decoration.¹⁴⁶

An inconsistency is again demonstrated.

"Coiling" is invariably associated with Pueblo pottery-making, either explicitly or implicitly. The following quotations illustrate this.

Holmes (1886: 273-275):

The ancient Pueblo potter rolled out long, slender fillets or ropes of clay, varying in width and thickness to suit the size and character of the vessel to be constructed. . . . When they were properly trimmed and smoothed, the potter began by taking the end of a single strip between his fingers, and proceeded to coil upon itself, gradually forming a disk. At first the fillets overlapped only a little, but as the disk grew large and was rounded upward to form the body of the vessel, the imbrication became more pronounced. The fillet was placed obliquely . . . and was exposed on the exterior side to probably one half of its width. *Strip after strip was added, the ends being joined so that the continuity might not be broken until the vessel was completed.*¹⁴⁷

Holmes (1903: 372) referred to this as the "process known as 'coiling',"¹⁴⁸ and remarked that "the support [*i. e.*, the base-retaining means, or the puki; *cf.* Guthe, 1925: 31] was not a mold in the ordinary sense." *This account of Holmes may well be considered a classic description of "ancient Pueblo" coiling.*

Cushing (1886: 489) described the process of a Zuni potter thus: "She coiled around and around a center to form the bottom, then spirally upon itself, now widening the diameter of each coil more and more, then contracting as she progressed upward until the desired height and form were attained." There is no specific indication as to whether one or several fillets of paste were used.

(*supra*) and that of the Pueblo of San Ildefonso, as described and illustrated by Guthe (1925: 31 ff., pls. 12b, 13-15).

¹⁴⁴ This is perhaps true of megascopic observation; however, microscopic examination often reveals dependable criteria of technique. A medium-power, wide-field microscope should suffice for such a purpose.

¹⁴⁵ Linné (1925: 79) inferentially excluded the Choroti from the users of his "continuous coiling" method.

¹⁴⁶ Such cases perhaps may be said to illustrate tecto-decorative, single or multiple fillet coiling, provided that the building process is continuous and carried on spirally.

¹⁴⁷ Italics are those of the present writer.

¹⁴⁸ Holmes (1889: 249) denied coiling and implied annular construction for the Potomac-Tidewater Virginia area.

However, J. Stevenson (1883: 375, 329), also writing of the Zuni, spoke of "additions of strips of clay," and expressly said that "traces of the addition of each strip . . . were removed before another . . . strip was added." This left some doubt as to whether circuit building or linked coiling was meant, although the use of several strips of paste was clearly established. The uncertainty, however, may be said to have been removed by the statement of Mrs. M. C. Stevenson (1904: 375): "The vessel is then formed by the successive addition of strips of paste long enough to encircle the bowl." This, unquestionably, identifies the process as circuit building.

J. W. Fewkes (1909: 53), by his reference to "corrugated or coiled ware," a practice with which one commonly meets in American literature,¹⁴⁹ implied linked fillets.

Kidder (1915: 414), speaking in broad terms, said: "The upper parts of ollas were constructed by the regular coiling method." Evidently, true coiling was meant, without, however, specifying whether any one or all possible variants of the methods were intended to be signified.

Nelson (1916: 168) used the designation "Corrugated or Coiled Ware" in dealing with both indented and plain material, for he expressly said: "Some bowls [his Type I] show traces of coiling."

Spier (1917: 207), referring to "coils," in dealing with corrugated ware, implied "coiling" for that category of pottery alone.

Morris (1917: 24-25):

But to lay spiral coil upon coil in uniform thickness, to regulate the length of the coils so as to produce the desired slopes of the vessel walls, and at the same time to make each pressure of the thumb mold its minute portion of the design which is worked out in the coiling, demands an initial accuracy of movement, and a control of a complicated technique worthy of an artist and not at all compatible with the bungling skill of a beginner.

This equates coiling with corrugation for decorative purposes.¹⁵⁰

¹⁴⁹ *Vide infra*, Nelson (1916); Morris (1917); Kidder (1925); and *cf.* Shepard (1936: 553, note 1).

¹⁵⁰ As Kidder (1936: 300, note 3) points out, it was Morris (1917) who "first called attention to the difficulty of making corrugated pottery. His paper conclusively refuted the then widely held theory that corrugated wares were older and more primitive than smooth-surfaced pottery." The significance of these observations inheres in their potential value toward chronological reconstructions in areas in which plain and corrugated coiling are in evidence. Kidder (1936: 297 ff.) is cautious and abstains

Kidder and Guernsey (1919: 141–142):

Corrugated pottery was built up by winding round and round on itself a long, thin fillet of clay which, in well made pieces, is continuous from its beginning at the bottom of the vessel to its termination at the rim; in some large jars this fillet attains a length of more than 200 feet.¹⁵¹ The laying up of this coil is in itself a very difficult matter, and when it is considered that it was often also notched, indented, waved or otherwise ornamentally modified during the building process, it will be realized how far removed this technique must have been from the first attempts of a nascent art. In the making of smooth-faced pottery any irregularity may be rubbed down or filled in, any fault of outline corrected by humoring the plastic walls into shape; in corrugated ware, however, no mistake could be corrected, and from beginning to end the coil must have been laid on with a sure hand and steady eye that must have come from long practice, not only in the handling of clay, but in its mixing exactly to the proper consistency for this delicate work. We think that it is no exaggeration to say that a large, ornamentally indented, corrugated olla required more skill for its construction than any other form of hand made pottery that has ever been produced in ancient or modern times.

This quotation furnishes an excellent illustration of the delicate procedure requisite in coiling which combines corrugation.

Kidder (1925: 7–8):

The post-Basket Makers . . . built up their vessels by adding to the growing walls successive *rings* of clay. . . . In pre-Pueblo times it became the fashion purposely to leave unsmoothed the last few *rings* at the neck of certain small cooking vessels. . . . This was the beginning of the elaborate *coiled or corrugated* technique, later so widely used. . . . The plain, broad *rings* of the pre-Pueblo ware were re-

from direct deductions. He states: "Whether this indented corrugation preceded or came after the development of coiling is as yet unknown. Presumably, however, coiling was an outgrowth of indenting, in order that the regular sequence of the indentations should not be interrupted. At all events, both techniques made apparently an almost simultaneous appearance. The next step, the corrugating of the entire surface of the vessel, including the base, was probably taken after the practice of indenting had become well established." (Cf. also Kidder, 1936: 386–387, quoted *infra*.) With clarification of the constructional methodology in pottery-making it should become possible to establish the relative time position of the several variants of coiling, and of the circuit mode not only in the "Anasazi ceramic family" (Kidder, 1936: 590), but elsewhere as well. In the case of the East, specifically with the Catawba, the ring building process is to be included in such considerations.

¹⁵¹ Such a fillet is composed of a considerable number of individual links.

placed by a continuous thin fillet of clay applied spirally; the junctions between the successive laps of the fillets were left unobliterated, not only at the neck, but over the entire vessel; and the fillet itself was also notched or pinched or otherwise indented to produce various ornamental effects. . . . Thus was made the well known *coil or corrugated* cooking-ware so characteristic of all the archaic true Pueblo ruins."¹⁵²

Here the "rings" may signify either several fillets used in true *coiling*, which itself is given as synonymous with corrugation, or the circuit method of construction. That the modern Pueblo of San Ildefonso use the circuit variant of building is well demonstrated by Guthe's detailed report.

Guthe (1925: 31 ff.), however, calls this process "moulding," and the base foundation "mould or puki."

Very briefly the process is as follows: The potter first forms a pancake-shaped pat of paste from six to eight inches in diameter; this she presses into the mould or puki, to form a base.¹⁵³ Then the walls of the vessel are built up by the addition of successive ropes, or rolls, of paste laid one upon another. . . . *If the roll is not long enough completely to encircle the pat, another is made and placed on it in a similar manner. When the edge has thus been completely encircled, the unused remainder of the roll is pinched off and tossed back on the mass of paste on the canvas. . . . When the flattening [of the applied roll] has been finished, the puki has made a second complete revolution, and the junction of the two ends of the roll is again directly in front of the potter. . . . When one roll has been completely welded on, flattened out, and incorporated into the vessel, another roll is formed, and is applied in exactly the same manner.* Thus the building proceeds to the height at which the shaping is begun.¹⁵⁴ (Guthe, 1925: 31–35.)

There is no direct mention of coiling; yet Guthe (1925: 35–36) quotes Binns (1910: 69 ff.) for the express purpose of "showing how closely modern studio-practice, undoubtedly evolved experimentally, resembles Pueblo Indian methods."¹⁵⁵

¹⁵² Italics are those of the present writer. The implications of this quotation suggest somewhat of a nucleus for chronological differentiation of the several constructional processes involved. Indeed they seem to provide a tempting lead with which to pursue further inquiries regarding the time relationship of circuit building, combination of circuits and coiling of neck, and all-over coiling. Cf. Kidder (1916: 255).

¹⁵³ Cf. Holmes (1886: 372) for the statement that this is "not a mold in the ordinary sense."

¹⁵⁴ Italics are those of the present writer.

¹⁵⁵ While Binns (1910: 70) intended to describe true coiling, and had partially done so, he did not exercise

The resulting ambiguity is misleading, as will presently be exemplified by a concrete case in point.¹⁵⁶ However, to continue with the Pueblo first.

Morris (1927: 198):

By the end of the post-Basket Maker period, all types of San Juan pottery, indigenous to the area under consideration, had passed their point of origin . . . and corrugated ware, while not actually represented, was present in the banded neck pots.

These specimens should be useful for tectonical analysis and chronological placement of the method.

Bunzel (1929: 6-7):

As a result . . . of the complete absence of the potter's wheel in pre-Columbian America and the failure of its native adaptation subsequently . . . all pottery is still made by coiling technique¹⁵⁷ . . . by adding narrow rounds of clay to a base set in a mold. The technique employed at San Ildefonso . . . is typical of the whole area. . . . The walls are built by adding rounds of clay.

This is another example of qualifying the Pueblo circuit building method as "coiling."

Kidder: (1936: 297-298):

To understand the significance of this peculiar treatment [*i. e.*, "the practice of surface embellishment by manipulation of the structural coil"—thus involving corrugation] requires discussion of the so-called "coiling" method of pottery making. . . . To achieve larger pieces and to provide them with restricted orifices it is necessary to build upward from a prepared base (either made with the hands or pressed into a mold) by the addition of successive increments of clay.¹⁵⁸ Although this may be done by placing

sufficient discrimination when he said: "A roll of clay is taken, one end laid in the center of the bat and the rest is coiled around it in a spiral line. [Thus far, this is true coiling.] . . . *In raising the walls it is best to pinch off the roll of clay when one circle has been completed and the new roll should be begun at another point so that all the joints will not be at the same place. This plan is better than coiling a long roll in a spiral for in this case one side of the piece will be higher than the other.*" (Italics are those of the present writer.) No doubt can exist as to the meaning of the last two sentences quoted: the "better plan" is none other than circuit building, expressly preferred to spirally carried coiling.

¹⁵⁶ Cf. the citations of Gifford (1928), *infra*.

¹⁵⁷ Bunzel (1929: 6) allows the exception of modeling only.

¹⁵⁸ This statement disregards sectional building achieved by means other than coiling. Cf. the Catawba method of ring or circuit erection of two or more portions of the body and their subsequent joining to produce a complete form.

lumps at intervals upon the edge,¹⁵⁹ a much more effective way, and one which has been and is still being used by almost all peoples in the pre-wheel stage of pottery making, is to build by means of a small roll of clay sufficiently long to encircle the whole edge and thus raise it evenly.¹⁶⁰ Such is the coiling method. The term is really a misnomer, for to coil means to manipulate cylindrically or spirally a continuous element. "Ring building" would more accurately describe the process as generally carried out, even in the Southwest.¹⁶¹ But in a part of that area, during later Developmental Pueblo times, it became customary to construct cooking vessels of a single strand of clay, which began at the base and, coiling upon itself spirally, continued to the orifice. The strand was of course not made its full length before work began; it was added to from time to time; but so carefully was each new increment joined that it is seldom possible to perceive a junction. The coiling element may therefore properly be said to have been continuous.¹⁶²

Kidder continues (1936: 386-387):

The so-called "coiling" method of making pottery has been described by Holmes,¹⁶³ Morris,¹⁶⁴ and others;¹⁶⁵ and, as employed by the modern potters of San Ildefonso, by Guthe.¹⁶⁶ Briefly, it consists of the building of a vessel by the addition to its growing wall of successive ring-like strips of clay; or, *and this is true coiling, by laying up spirally, a single long strip.* This general method was probably used by the prehistoric Pueblos and by their cultural ancestors, the Late Basket Makers. I say probably because the junctions between the rings or between the laps of the coil were normally removed from all vessels except cooking pots by scraping and smoothing. Upon the exterior of cooking pots the coils were often allowed to remain; and were manipulated decoratively. But that most, if not all, non-culinary ware was also built

¹⁵⁹ *I. e.*, construction by the addition of either amorphous dabs (Kidder's Jumps) or specifically shaped morsels of paste.

¹⁶⁰ This is exactly the chief determinant of circuit building, *i. e.*, that mode of procedure in wall erection in which each individual roll of paste equals, in its length, the circumference of the growing vessel at the plane upon which the fillet is being applied. Cf. the Catawba procedure.

¹⁶¹ This would then be confused with the ring-building variant of annular construction.

¹⁶² There follows footnote 1: "Regarding the above statement Miss Shepard comments: 'I believe the two ends were welded in place on the pot. . . . Actually, I have found a good many examples of these welded ends.'"

¹⁶³ Cf. my quotation, *supra*.

¹⁶⁴ Cf. my quotation, *supra*.

¹⁶⁵ Cf. my quotations of Cushing, Harrison, Linné, and Wissler, *supra*.

¹⁶⁶ Cf. my quotations of Guthe, *supra*. Note Kidder's direct reference to "coiling" at San Ildefonso as against Guthe's "moulding."

up with strips is strongly indicated both by the clean horizontal fractures which sometimes occur; and, even more clearly, by the presence of unobliterated *rings* in the interiors of certain pieces with orifices too small to have permitted introduction of the hand. *All modern Pueblo pottery is also built with rings; it is therefore to be inferred that the same practice obtained for the decorated wares of Pecos.* There is, indeed, some actual evidence to that effect, and the fragments which yield it, also provide interesting information as to how the work was done.¹⁶⁷

Miss Shepard (1936: 552) writes of corrugated ware:

In many types of Pueblo culinary ware the structural coils have been carefully preserved and regularly dented. . . . It is possible to recover much of the detail of construction by close observation and systematic experimentation.¹⁶⁸

Miss Shepard (1936: 440, 441) uses the term "moulding" in a collective constructional sense, whereas with reference to "Moulding and Shaping" of the modern Pueblo potters she says (1936: 448): "Guthe's description of pottery making at San Ildefonso furnishes an excellent example of the observations which should be made in recording methods in building *coiled* ware."¹⁶⁹ Kidder, as already quoted, clearly stressed the difference between coiling and "ring" building. However, even in his "Discussion" (1936: 590) we read: "Anasazi pottery was made by coiling."¹⁷⁰

¹⁶⁷ Italics are those of the present writer.

¹⁶⁸ There follows an excellent account of Miss Shepard's detailed studies of the manufacture of indented and corrugated wares of Pecos, which deal with the criteria of the original manipulation. In footnote 1, p. 553, Miss Shepard justly comments: "There is some looseness in the use of the term *coil* and *corrugated*. They are here used in the following sense: coil refers to a process in pottery making [the process obviously implying construction, *vide infra*]. A vessel is considered coiled if it is built by successive rolls of clay placed *either in rings or spirally* [emphasis added] irrespective of subsequent smoothing and without reference to the method of shaping, whether by hand, a gourd rind tool or with paddle and anvil." The stipulated segregation of construction from shaping is noteworthy. On the other hand, it is apparent that Miss Shepard was not immune to the general confusion regarding constructional methods, for she included annular manipulation under coiling.

¹⁶⁹ Italics are those of the present writer. It will be recalled that Guthe did not qualify the process as coiling.

¹⁷⁰ This, the author stipulates, distinguished the Anasazi ceramic family from the Hohokam group, which is said to be characterized by the paddle and anvil method. It seems in point to note that the distinction rests on the consideration of two wholly separate steps of manufacture

In order to illustrate the process usually called "coiling with paddle and anvil," I quote from a pertinent work of Rogers (1936: 9), dealing with the technique of the Southern Diegueño:

Coils average about twelve inches in length regardless of the size of the piece under construction. . . . The [first] coil is fastened to the base by pushing a small section of it over and on to the outer wall of the base with the left thumb, at regular intervals of one inch, while the right hand feeds the coil in a clockwise direction. . . . If the coil is not sufficiently long to go around the base once it is spliced with part of another coil. . . . Spiral coiling, as in the Puebloan technique, is unknown; *and each coil is a unit concentric to its predecessor.* After the bonding process is completed the coil is beaten flat with the paddle.¹⁷¹

Obviously, the tectonic principle of this method depends on the circuit variant of annular construction, the unit being either a single or a composite fillet. The paddling itself is a distinctly separate step which follows the placement, adjustment, and bonding of the fillet. The potter, then, does not "coil with the paddle," but merely beats the fillet flat *subsequent* to the constructional manipulation. The tectonic components are not coils in the true sense of the word.

A revealing example of confusing the process of construction proper with subsequent manipulation, appears in Spier (1928: 139):¹⁷²

Cylinders, 2 cm. in diameter, are rolled out between the palms and coiled in a clockwise direction on a tray basket, patted on top the while with a small, smooth stick to make them adhere. . . . When the flat coil reaches a diameter of 20 cm. the sides are built up by coiling in the same manner; the potter supporting them with a smooth, round pebble inside while the exterior is paddled.

This citation shows that the basal part is built by plano-coiling. The use of the stick, for the purpose of bonding, is clearly a post-constructional process. The wall construction, although specified as "coiling in the same manner," could not, obviously, be attained by plano-coiling. Spier's

which involve entirely different principles of manipulation, *i. e., construction proper* (Anasazi) and *post-constructional conditioning* (Hohokam). Coiling as a tectonic procedure is well recognized in Hohokam pottery (*cf.* Roberts, 1937: 20). Its paddle and anvil technique, now generally accepted, does not preclude the possibility of coiling or of annular building. (*Cf.* V. J. Fewkes, 1938: 197; 1941*b*.)

¹⁷¹ Italics are those of the present writer.

¹⁷² *Cf.* also V. J. Fewkes, 1941*b*: 162-193.

text does not allow the reader to perceive the true tectonic principle involved. Yet it may be *presumed* that either an annular or a true coiling method was observed by Spier.

Gifford (1928), in his study of the Southwest, conceived of two major categories of pottery technique: "coiling without the paddle and anvil"; and "coiling with the paddle and anvil."¹⁷³ His work furnishes an example of the danger of applying the term "coiling" in a loose sense. "Coiled pottery made without the paddle and anvil," says Gifford (1928: 354), "is characteristic of Pueblo culture, both ancient and modern,¹⁷⁴ and is also made by the Navaho."¹⁷⁵ The original source on the Navaho, cited by Gifford, reads as follows:

The paste is rolled out into long, slender pieces or ropes; this done, a flat, round cake of the desired circumference is made of a lump of the mud, and serves as the bottom of the pot around which *one of the rolls of mud is wound and made fast by pressing and gently kneading with the fingers. . . . Another roll is added and fastened in the same way, by which process the potter is enabled to give the pot the desired shape and size.*¹⁷⁶

This description plainly identifies the process as circuit building. Speaking of his own observations among the Cocopa, who use the paddle and anvil—in *thinning the wall*—Gifford writes (1928: 355): "The . . . cylinder of clay . . . proved to be just of the right length for one circuit of the edge of the growing vessel. . . . The process of adding concentric coils was continued until the vessel was complete."¹⁷⁷ This in itself is ample proof of circuit building, and not coiling.¹⁷⁸

¹⁷³ Cf. also V. J. Fewkes, 1941b: 163.

¹⁷⁴ Citing Goddard (1927: 86), apparently the following passage: "Round after round of clay, rolled into a slender cylinder, is applied." This suggests circuit building, which is certainly characteristic of the modern Pueblo technique.

¹⁷⁵ There follows a lengthy quotation from Guthe (1925), which has already been discussed. Gifford accepted Guthe's "moulding" as "coiling" without comment.

¹⁷⁶ *Franciscan Fathers* (1910: 289); italics those of the present writer.—Cf. also Tschopik (1941: 23 ff.) and Keur (1941, especially pp. 52 ff.).

¹⁷⁷ Italics those of the present writer. Gifford (*ibid.*) expressly identified the *wall-thinning* function of the paddle process. Gifford (1933: 318 ff.) reiterated this in a tantalizingly stunted account of Cocopa pottery-making. Cf. V. J. Fewkes (1941b: 163).

¹⁷⁸ The presence or absence of the paddle and anvil does not affect the manipulation incidental to the placement, adjustment, and bonding of the tectonic components. In handling the paste medium during these processes, the potter's hands must be free. Cf. Gifford (1933: 318 ff.) for an illustration of this principle.

Gifford (1928: 355) conditionally assumed coiling for the Paiute, deriving his source from Lowie's brief reference (1924: 225) to the subject. At the time of Lowie's investigations, the Paiute were no longer actually making pottery, although the craft was in the memory of one woman whose recollections Lowie recorded (1924: 225). Gifford's assumption appears to be based on the following passage (Lowie, 1924: 225): "The coiled technique was employed." From the vague statements given by Lowie's informant it is not possible to reconstruct the probable building method followed by the Paiute. Nor can the circumscribed reference to "coiled technique" be used, since it lacks proof of the diagnostic criteria. Lowie, however, refers (1924: 226) to specimens of Shoshonean pottery in the Peabody Museum, Harvard University, and in the Museum of the American Indian, Heye Foundation, New York.

Through the courtesy of the Peabody Museum, I have examined the vessels in Cambridge, and am able to furnish the following data regarding their history and manufacture. There are three vessels in the collection, all labeled Paiute. Two of these, each "restored from old sherds," are both numbered 12131. The third, numbered 9448, is described in the catalogue entry as a "cooking pot, to sit in sand, made in imitation of old pots." All were collected by Dr. E. Palmer, the "imitation" vessel in 1875, and the "old sherds" in 1887. There are no notes relating to this pottery in the records of the Peabody Museum aside from the brief notations accompanying the catalogue entries. The restoration of the two vessels from the "old sherds" was done in Cambridge by the late Mr. S. J. Guernsey. The restored specimens, one with approximately one-quarter, the other with approximately one-half of plaster work, as well as the intact "imitation" pot, are of a roughly conical shape, each with an obtusely pointed bottom. The two restored vessels reveal sundry positive evidence which indicates the following manner of construction. The base appears to have been modeled in plain hands and shaped within a support made of a piece of skin, the gathered lower terminal and vertical folds of which left clear impressions on the bottom. The body of the wall was built by exterior molding over a form consisting either of a weighted skin or a carrier type basket smeared with some substance (pitch, potter's paste?) to attain smoothness. The paste medium appears to have been added in the form of irregular strips, the overlaps and bonding of which are plainly in

evidence. Finger stroking on both surfaces is clearly identified by broad streaks and minute striations. The specimen having only about one quarter of plaster restoration shows a complete continuity of its wall from base to rim. Its measurements are: maximum height, 0.393 m.; maximum diameter, taken inwardly at the rim, 0.315 m.; average wall thickness, 0.006 m. The "imitation" pot apparently had its basal part and approximately the lower third of its body modeled in hands, whereas the rest of the wall was constructed by adding irregular morsels of paste, but without the use of a mold. Overlapping of the paste additions, bonding, and finger stroking, are again fully in evidence. The interior surface, however, appears to have been smoothed down with some soft vegetable fibres, perhaps a bunch of grass blades, which left well-defined traces aligned in more or less horizontal or oblique bands.¹⁷⁹ *There is no evidence of coiling in any of the three vessels.*

Under his distribution of "the non-paddle method of coiling," Gifford (1928: 356) included the Catawba. As has been shown, the contemporary Catawba are totally unacquainted with coiling. And there is no evidence to indicate that they ever used it in former times, or that they acquired it in the course of their contacts with the Cherokee. Harrington's account (1908a) of Catawba pottery-making, which Gifford cites (1928: 356), does not stipulate the circuit process, but the reader cannot fail to recognize its existence.¹⁸⁰

Gifford (1928: 357) accepted Harrington's find (1922: 194, fig. 33) of a pottery anvil in Tennessee as a sufficient indication that the ancient Cherokee practiced "coiling" of the paddle and anvil variety.¹⁸¹ For the modern Cherokee, Gifford (1928: 357) also followed Harrington (1908b).

¹⁷⁹ This vessel, while plastic, cracked in drying; the defect was somewhat alleviated by an interesting method of mending which consisted of applying potter's paste, of the same nature as that used in the original construction, over and along the rift.

¹⁸⁰ Harrington stated (1924: 271): "I was interested then [1908] to observe that the Catawba used the coil method." This was based on Harrington, 1908. Some of the potters at Catawba still remember Harrington's field work at the reservation, and they agree that coiling was not practiced within their memory. This is significant, for Mrs. Sally Gordon, now past seventy years of age, corroborated the statement; her integrity and dependability are well established.

¹⁸¹ The wooden paddles illustrated by Harrington (1922: fig. 33) are modern specimens. Harrington did not express his opinion as to the manufacturing technique in either of his two groups of archaeological pottery.

It will be recalled that Ewi Katalsta, the Cherokee potter observed at work by Harrington (1908b: 223), did not demonstrate coiling,¹⁸² but circuit building.¹⁸³

Gifford (1928: 357) also misinterpreted the interesting constructional procedure reported by Lothrop (1927), by referring to it as "an unusual combination of *shaping and coiling*,"¹⁸⁴ with the bottom of the pot formed last. In this method no paddle or anvil is used, the entire *shaping* being done with the hands."¹⁸⁵ The Guatajiagua example, unique in several respects,¹⁸⁶ depends essentially on hand modeling. Only in the formation of the bottom and sometimes, though not always, in the adjustment of the rim, does the potter employ the circuit technique;¹⁸⁷ she then uses either a single or a composite fillet, which does not exceed the circumference of the vessel at the plane of its attachment.¹⁸⁸ There can be no doubt, however, that the principle of coiling is totally absent.

The foregoing citations should suffice for the present purpose. My next concern is to suggest a classification of manual construction methods in primitive pottery-making. This is done here in full cognizance of my personal limitations in coping with the task. The conceptions are rooted largely in empirical criteria, and there is no intent whatsoever to propose any set standards. Admittedly, my own observations of potters at work provide the most useful sources; these are augmented by dependable literary records. In dealing with the archaeological material, only obviously recognizable criteria have been taken into consideration. It must be stressed that I am here concerned primarily with the phenomena and tasks of the North American continent.

¹⁸² Which, it is true, is characteristic of the aboriginal Cherokee method, but which no longer survives with the contemporary Cherokee potters.

¹⁸³ Griffin (1935: 19-20) considered the Catawba and Cherokee methods as "identical examples of coiling."

¹⁸⁴ Not specified by Lothrop.

¹⁸⁵ Italics those of the present writer.

¹⁸⁶ *E. g.*, the constructional procedure, the difficult posture maintained by the potter, the guidance of shaping achieved with the aid of her toes, and the final step taken in closing the small orifice of the bottom (*cf.* Lothrop, 1927).

¹⁸⁷ Lothrop (1927: 113) expressly states that *the rim* is "built up by adding coils." This, apparently, induced Gifford (1928: 357) to speak of the technique of the Guatajiagua potters as a "combination of shaping and coiling"—actually modeling supplemented with circuit and morsel building.

¹⁸⁸ Personal information from Dr. Lothrop.

Empirically, spatially, and temporally viewed, there are two broad possible manners of constructing a pottery vessel *exclusively by the hands*:

- A. By modeling, wherein the potter produces the vessel by direct shaping from a lump of paste, without necessarily using any additional material (fig. 3).
- B. By segmental building, wherein the potter uses one or more tectonic components, in the form either of a fillet or of a morsel, depends on a progressive and orderly procedure, and uses additional paste as the desired vessel grows (fig. 5).

The principle involved in modeling is self-evident from the stated definition. Two main categories of product may be attained by modeling:

- I. Vessels, *i. e.*, receptacles capable of accommodating certain contents.
- II. Appendages, such as lugs, handles, spouts, decorative features (*e. g.*, knobs, nodules, warts, ribs, ridges), and figurines (anthropomorphic, theriomorphic, etc.). These may have:
 1. A solid body.
 2. A hollow body.

The methods of segmental construction may be classified as follows:

- I. Methods depending on fillet components.
 1. Annular procedure.
 - (a) Circuit variant.
 - (i) Single fillet (fig. 5).
Examples: modern Catawba practice (*vide supra*); modern Pueblo practice (Guthe, 1925: 31 ff.).
 - (ii) Composite fillet.
Example: modern Yuma practice (Rogers, 1936: 9).
 - (b) Ring variant (fig. 6).
Examples: modern Catawba practice (*vide supra*); modern Maya practice (Thompson, 1934: 95).
 2. Coiling.
 - (a) Single(?) fillet.

A possible although questionable example, the alleged method of the eighteenth-century Natchez (Butel-Dumont, 1753, 2: 271 ff.).¹⁸⁹

(b) Linked (chained) fillet (fig. 32).

Example: Anasazi corrugated ware (Kidder-Shepard, 1936: 297-298, 552-553).

- II. Methods depending on morsel components.
Examples: Much of the ware made by the modern descendants of the Gay Head Indians, Martha's Vineyard, Massachusetts (V. J. Fewkes, 1941a: 67). Perhaps also some of the archaeological laminated pottery of the Woodland, *i. e.*, that made without the use of a mold (Fewkes, 1937: 145).

The scheme just outlined (*cf.* also V. J. Fewkes, 1940: 142) is, of course, subject to modification and elaboration. Its framework, however, has proved itself adequate in sampling a series of literary sources for classificatory purposes. In some of these, details concerning the diagnostic characteristics of constructional technique were found to be either recondite or ambiguous. Yet with very few and rather insignificant exceptions it has been possible to interpret these cases in terms of the classification just discussed.

Coiling in pottery-making is not a very simple process. Whether its origin can be traced to basketry technique¹⁹⁰ or not,¹⁹¹ the manipulation does not suggest a rudimentary stage in pottery manufacture. It is, of course, imperative to agree with Morris (1917: 24 ff.) and with Kidder and Guernsey (1919: 141 ff.) that corrugation represents a signal advance in coiling. Logically considered, the plain, hand-modeling mode of construction appears to be the most elementary; empirically, it is perhaps to be viewed as the most simple, most widely spread, and most profusely surviving method of pottery-making. And it is the modeling technique which best serves initial efforts in pottery-making—again empirically viewed. The circuit building, it seems to me, is also a rather simple procedure; I should have no hesitation in regarding it as an antecedent of coiling in the Southwest if the sample material which I have examined in this relation is representative enough. Ring building, on the other hand, impresses the observer as a specialized development.

It would be futile to attempt to rationalize the likely historical priority of modeling over circuit building, for it cannot be done on an equal temporal and spatial basis.¹⁹² Such a question is

¹⁸⁹ *Cf.* Mason (1902: 160; 1911: 98).

¹⁹¹ *Cf.* the caution expressed by Morris (1917: 29).

¹⁹² Certain regions, however, such as the Southwest, do offer a more promising ground in this respect.

¹⁸⁹ Positive proof of a historical example of the indubitable use of a single fillet does not seem to exist.

inseparable from that regarding the origin of pottery itself. That opinions are nowise in accord with respect to this perennially interesting but virtually intangible subject, is all too well known. The technologist, it appears, rather inclines to support multiple origins, sometimes perhaps quite to the discomfiture of the diffusionist. The consternation of the opposing side—that favoring a single origin—is not substantially alleviated by recourse to convergence, the alleged criteria of which are often superficial and irreconcilable with spatial and temporal aspects. In any event, it seems that it is not so much the technologist who insists on his view, but often rather his interpreter.

The student of pottery technology is concerned not with matters which escape tangible approach, but with positive criteria and objective methodology. Pottery studies are, by the very nature of the subject, endeavors of a composite and diverse character; they inevitably necessitate a host of heterogeneous considerations. It is imperative to be as technical as necessary, for in dealing with the complex material the student must be exacting and exhaustive. The signal value of pottery in culture history has too often been stressed to require a review in the present writing. It was not until very recently that technological research has really been realized as a distinct aid to archaeology. But a full dose of the new discipline, still in an experimental stage, is not a palatable one for many an archaeologist; some are baffled thereby, others quite distrustful as to how far the details should be pursued. Whatever the reaction, the new discipline seems to be here to stay, for its utility—although yet to be tested in several respects—is, on the whole, quite patent. It is particularly desirable that the future work be directed along the lines of a broad approach rather than concentrated on disproportionate details. In other words, less of a vertical and much more of a horizontal expansion in technological research should prove more beneficial to archaeology.

The constructional aspect is a constituent part of the technology of pottery. As such it deserves attention commensurate with that devoted to other attributes of a given pot. Moreover, it lends itself to an objective determination; more precisely so, of course, upon direct observation of the process, but also, with growing success, in the study of fragments.

It is in response to such thoughts as have just been touched upon that I have gone into the

matter of coiling at this length. In as much as the Catawba do not, and to my best knowledge never did, resort to coiling, it was imperative to include a critical examination of the subject.

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