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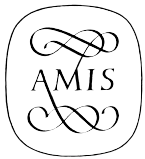

# North American Indian Musical Instruments: Some Organological Distribution Problems

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This study is based on musical instruments of the North American Indians, but the methods presented here could be applied to a study of distribution patterns for the folk instruments of any culture.[1] Detailed ethnographic literature can be found for most cultures, and for the North American Indians many sources describe the general distribution of cultural elements.[2] In the area of musical instruments, however, most of this information is widely dispersed, and there are no collective printed references available. The purpose of this essay is threefold: to summarize present knowledge of the distribution of musical instruments among the North American Indians; to discuss methods for the coordination of data on the distribution of instruments; and to consider the implications of distribution analysis, both for the study of American Indian culture and for ethnomusicological and organological research.[3]

1. Typical studies in other culture areas include Karl Gustav Izikowitz, *Musical and Other Sound Instruments of the South American Indians* (Göteborg, 1935), and Percival R. Kirby, *The Musical Instruments of the Native Races of South Africa* (Johannesburg, 1953).

2. Especially well-organized data will be found in the Cultural Element Distribution series published in the University of California *Publications in American Archaeology and Ethnology*, XXXVII (1935), and *Publications in Anthropological Records*, I–IX (1937–1950), and in the Human Relations Area Files. Additional information is available in most tribal ethnologies found in publications such as the Bureau of American Ethnology *Bulletin* and *Annual Report*, Columbia University *Contributions to Anthropology*, American Museum of Natural History *Anthropology Papers*, and the *American Anthropologist*.

3. The discussion to follow is based on the author's knowledge of North Ameri-

Several attempts to classify musical instruments have been presented in the past century.[4] Most of these attempts agree that instruments can be divided into string (chordophones), wind (aerophones), and con/per-cussion types. The latter class may be subdivided into (a) idiophones (where the body of the instrument itself undergoes vibration to produce the sound) and (b) membranophones (where a tightly stretched membrane vibrates, thereby producing the sound). These four categories are based solely on the method of sound production;[5] this basic taxonomy will be accepted for the present, and the distribution of each class in North American cultures briefly discussed.

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can musical instruments, including studies of the holdings of the National Museum of Natural History of the Smithsonian Institution and of several smaller collections. I am particularly indebted to Professor Bruno Nettl for his preliminary maps of North American Indian musical instrument distribution patterns, prepared in the mid-1950's, on which the maps included here are in part based. To a limited extent these maps have been checked against the standard literature and additions have been made from more recent ethnological and ethnomusicological literature and from museum studies; but these geographical distributions are tentative only and require further research as suggested in this paper. They are presented here solely as a base to which the following parts of the paper may refer. Maps of this kind for North America were presented in Helen Roberts, *Musical Areas in Aboriginal North America*, Yale University Publications in Anthropology, 12 (New Haven, 1936); for South America in Erland Nordenskiöld, *The Changes in the Material Culture of Two Indian Tribes under the Influence of New Surroundings*, Comparative Ethnographic Studies, 2 (Göteborg, 1920); for Africa in Heinz Wieschoff, *Die afrikanischen Trommeln und ihre ausserafrikanischen Beziehungen* (Stuttgart, 1933).

4. For representative samplings, see Erich M. von Hornbostel and Curt Sachs, "Systematik der Musikinstrumente. Ein Versuch," *Zeitschrift für Ethnologie*, Jahrg. 1914, Heft 4 and 5, translated by Anthony Baines and Klaus P. Wachsman as "Classification of Musical Instruments," *Galpin Society Journal*, XIV (1961), 3–29; Victor Mahillon, *Catalogue descriptif et analytique du Musée instrumental du Conservatoire de Bruxelles*, 5 vols. (Brussels, 1892–1922); Izikowitz, op. cit.; Hans-Heintz Draeger, *Prinzip einer Systematik der Musikinstrumente* (Kassel, 1948); Jeremy Montague and John Burton, "A Proposed New Classification System for Musical Instruments," *Ethnomusicology*, XV (1971), 49–70; Mantle Hood, *The Ethnomusicologist* (New York, 1971).

5. This is not true for Hornbostel and Sachs' internal subdivisions; for example, the strings are subdivided according to such external features as the shape of the body, the presence or absence of a resonator, the number of strings, etc.

## *Chordophones*

Only two types of stringed instruments are known to have been readily adapted into the early life style of the North American Indians—the musical bow and the "Apache-fiddle."[6] Future detailed research may determine the origin of these instruments and the possible relation of the "Apache-fiddle" to European models.[7] Both instruments are found predominantly in the southwestern United States (see Map 1).[8] The "Apache-fiddle"—a one-stringed[9] instrument using a hollowed agave stem as its body (Figure 1)—was and is found in southern California and Arizona among the Apache and Diegueño. The musical bow has a somewhat wider distribution, from the Carrier of northwest Canada to the Salinan near San Antonio, Texas. Izikowitz[10] notes that the use of the mouth as a resonator was common to all of these cultures (except the Carrier, which he does not include in his discussion). The method of playing, where known to Izikowitz, consisted of striking the string with a stick or an arrow. However, the use of a special bow instead of the ordinary hunting bow was individualized from culture to culture. Adequate information on the present use of the musical bow is not available. Philip Drucker cites the use of the bow by the Pima and Papago,[11] but in the course of much fieldwork I have found no references to or remembrances of this instrument in the early 1970's.

6. Although other stringed instruments are mentioned by chroniclers and ethnologists, the descriptions of most leave no doubt that they were strongly influenced by European instruments such as the violin, balalaika, or banjo; this influence is demonstrated by many museum specimens.

7. Izikowitz, pp. 202–203, attributes Spanish influences to a similar instrument found in Central and South America.

8. A variant found in the Midwest is described in Helen Roberts, *Musical Areas in Aboriginal North America*, Yale University Publications in Anthropology, 12 (New Haven, 1936), p. 15.

9. Roberts, p. 15, indicates two-stringed instruments as well, but most descriptions and museum specimens have only one string.

10. *Musical and Other Sound Instruments of the South American Indians* (Göteborg, 1935), p. 200.

11. "Yuman-Piman," *University of California Publications in Anthropology*, VI (1941), 125.


MAP 1 Chordophones

The author wishes to acknowledge the University of Chicago Press, from whose publication *Indians of North America* by Harold E. Driver (copyright 1961, 1969 by the University of Chicago Press) the basic tribal map has been reproduced. The present author is solely responsible for the overlaid data presented here.

## *Aerophones*

One of the most widely distributed wind instruments is the flute[12] (Figure 2). This instrument is found from coast to coast in the United States and southern Canada (see Map 2). Although complete information for this instrument has not yet been compiled,[13] many details are known for the shaded areas of Map 2. This includes data such as the number of stops on a flute, the material of composition, and the method of blowing the instrument. As compilation of these data is incomplete at present, no graphic presenta-

12. I prefer this term to the more frequently used term "flageolet" for two reasons: first, the word "flute" is used by the Indians themselves; second, the majority of these instruments are what Hornbostel and Sachs (*Galpin Society Journal*, XIV [1961], 26) term "flutes with internal ducts." The decimal classification for this type is 421.22.

13. Specific information, especially about Plains Indian flutes, will be found in a manuscript being prepared by the author cataloguing the American Indian instruments of the United States Museum of Natural History of the Smithsonian Institution. For additional information see Laura E. Gilliam and William Lichtenwanger, *The Dayton C. Miller Flute Collection* (Washington, 1961).

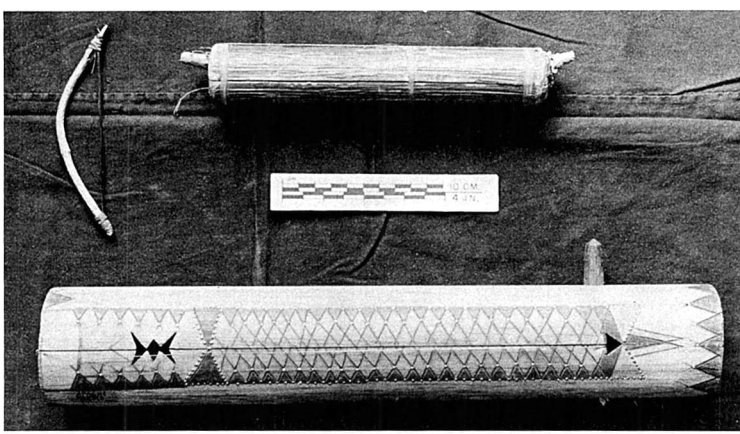
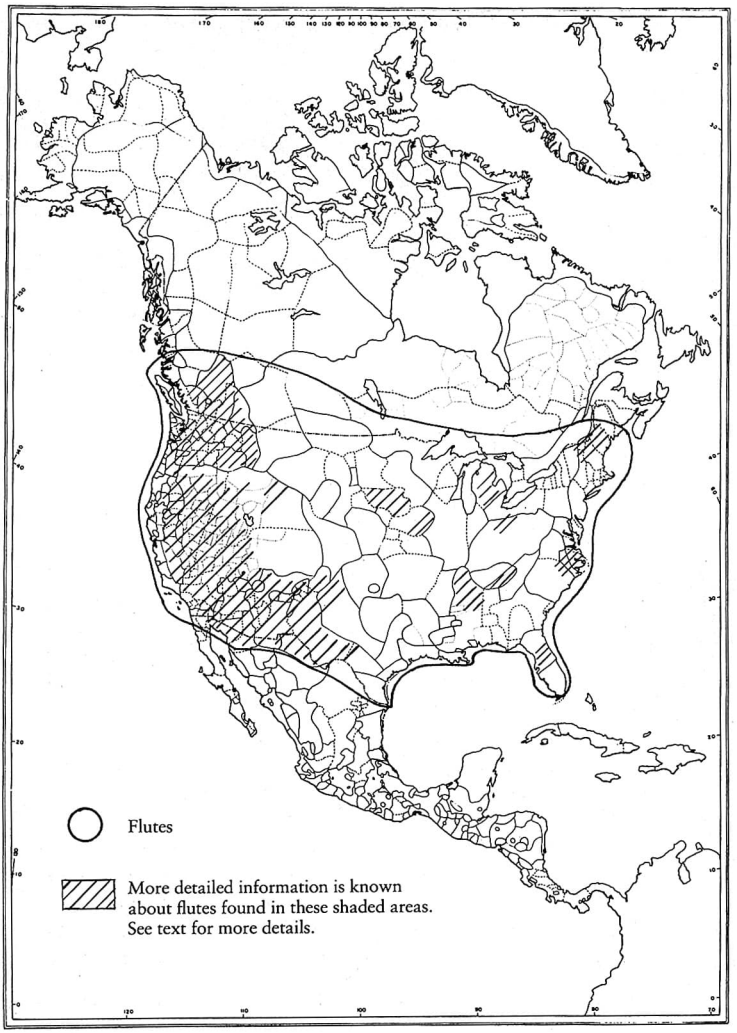


FIGURE 1. Two Apache violins. The top one is the oldest of this type in the Smithsonian collection (Cat. No. 5521) with its bow. The lower one is the newest in this collection (Cat. No. 358 919).


Flutes
More detailed information is known about flutes found in these shaded areas. See text for more details.

MAP 2 Flutes

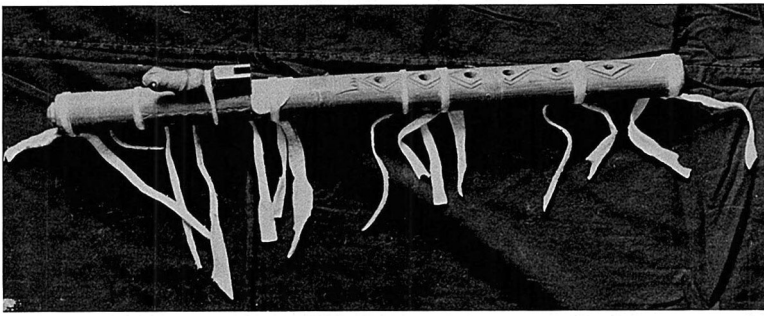
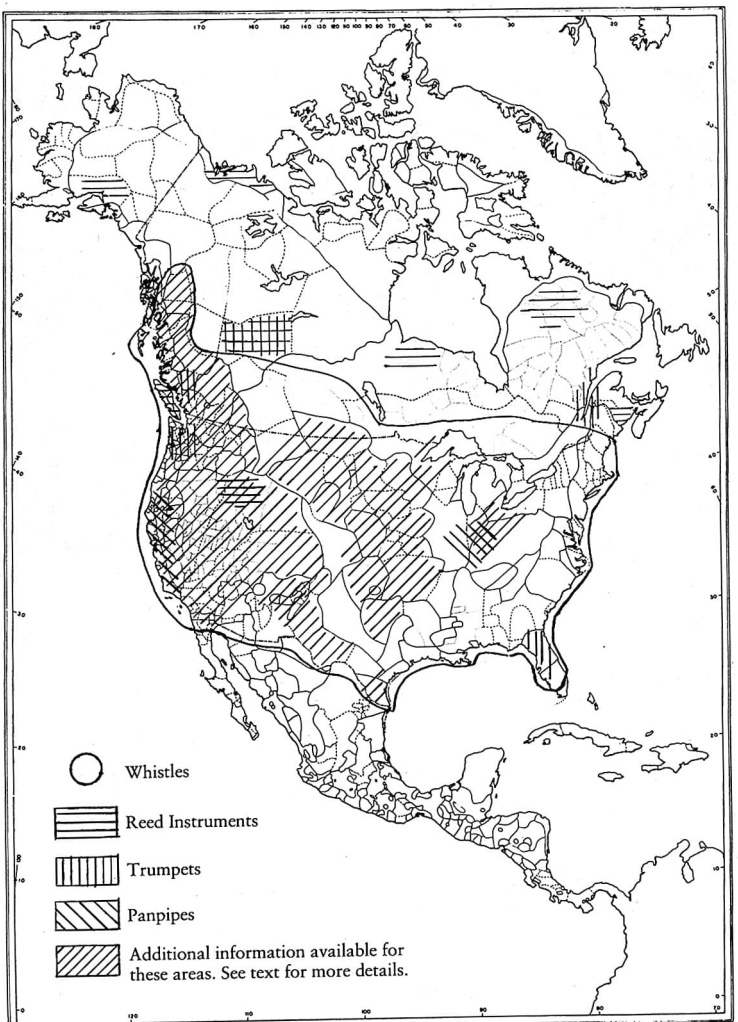


FIGURE 2. Kiowa flute of the internal duct type. (National Museum of Natural History Cat. No. 175 633.)

tion or comparative study is attempted here, but some of the extremes of the data may indicate the types of details available. Flute stops vary from two to nine with no apparent relationship existing between marginal areas of their distribution. Wood and cane are the principal materials of manufacture, although bone and, to a lesser extent, bark are also used. Pottery flutes—among the few flutes without ducts (Hornbostel and Sachs 421.1)—have been found in the Southwest. Although most flutes are blown from the end, side-blown flutes have been encountered in some regions including the Plateau area. The American Indian flute is generally blown with the lips, but the use of the nose flute has been reported in the Great Basin Area.

Map 3 gives the known distribution of aerophones other than flutes. It indicates that reed instruments are found only in the Eskimo, Northwest Coast, and northern Great Basin areas.[14] These normally consist of a ribbon reed (of grass or another stem, or occasionally of a thin wooden or metal strip) placed inside a hollow chamber, although some instruments are of the oboe type. These instruments vary in size from several inches to over a foot in length, and also vary in design, having from one to five chambers,

14. Animal calls made on the same principle are found in many other areas as well.




MAP 3 Aerophones Other Than Flutes

FIGURE 3. Plains Indians bone whistle. (National Museum of Natural History Cat. No. 387 908.)

each with its own reed. Trumpets, made from shells, bark, or wood, occur less frequently in scattered areas of Florida, the Northwest Coast, and in Canada.

The whistle (Figure 3) shows an even wider distribution than the flute. Additional data available for whistles include the material of composition (generally wood or bone), the material from which the deflector is made (usually asphalt or pitch), whether the whistle chamber is stopped or not, types of external decoration, and function. The latter varies widely from culture to culture. Of special interest is the use of several whistles tied together (as a panpipe) found in several areas in California. Archaeological evidence exists for similar panpipes used by the Hopewell Indians. The bullroarer (although not represented cartographically) may be found in the Southwest, California, Great Basin, Plateau, Northwest Coast, and Northern Plains areas as well as sporadically in Alaska and central Canada. The function of this instrument also varies widely.

## *Membranophones*

The single-headed hide drum, often called a "hand drum," "tambourine drum," or "tambourine," is the most prevalent of the membranophones found in North America. Map 4 shows its distribution from the northernmost coastal areas to the southern geographical barriers with the exception of the Lower California–Arizona–Sonoran Desert region. The double-headed hide drum (Figures 4 and 5) appears with less uniformity, with only a scat-

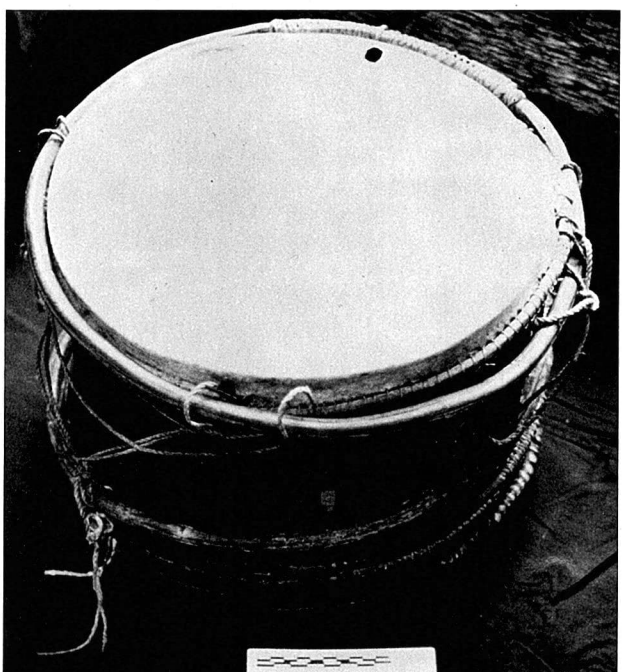
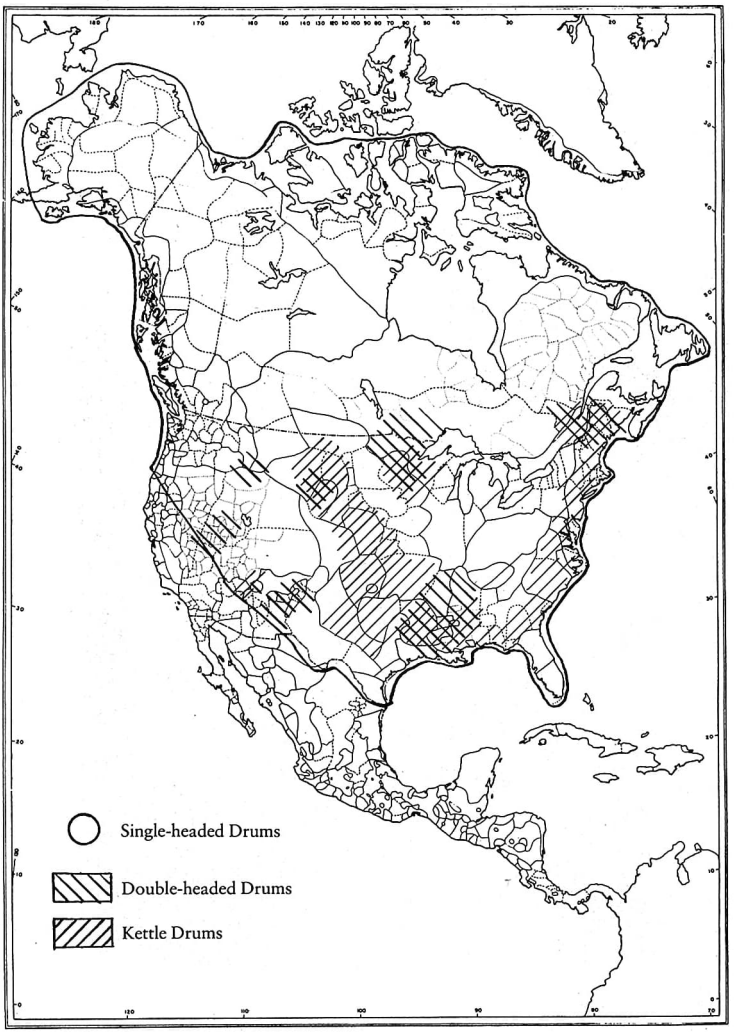


FIGURE 4. Double-headed drum collected by George Catlin prior to 1839. (National Museum of Natural History Cat. No. 73 322.)




MAP 4 Membranophones

tered distribution pattern across the continent. The kettle drum (usually filled with water) is used in the East and Southeast; a more recent usage is in the Plains areas in connection with the Peyote ceremony. These instruments may be further divided according to whether they are used with wet or dry heads. In many parts of the North and Central Plains an unmounted hide is stretched between

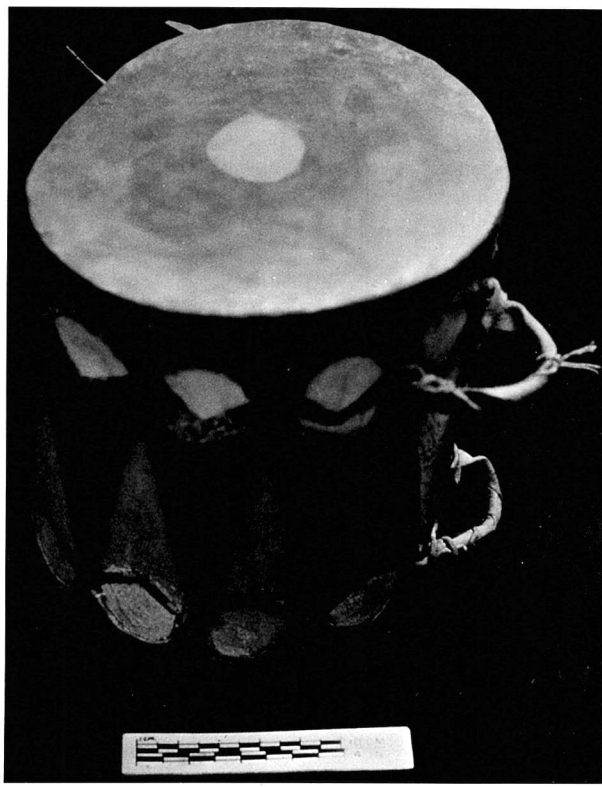


FIGURE 5. Double-headed drum made by the Zuni Indians. (National Museum of Natural History Cat. No. 234 377.)

stakes and beaten as a drum. The predominant method for playing these drums is by striking the skin with a stick, although in some areas the hand may be used to beat the drum (as is frequently the case with the Peyote drum).

## *Idiophones*

In this category are found the most numerous and most diverse of all North American Indian musical instruments. Only one type, container rattles, has been given cartographic representation (Map 5) here, but the other instruments must also be mentioned.

*Beaters*: Along the Northwest Coast are found wooden boxes and planks which are beaten for a musical accompaniment. In the Plateau area, logs and poles serve the same purpose, while in the Northeast, bark and turtle shells are used as beaters. The Delaware, Iroquois, and Pueblo cultures make a beater by folding a dried deerskin into a tight bundle and beating it with wooden sticks. In several cultures two sticks are struck together.

*Drums without skins*: Drums made of a hollowed log or half log are found on the Northwest Coast and in central California; they do not have slits as do the *Teponatzli* of Mexico. "Foot drums" consist of a plank or log which is stamped on and are usually found in the Northwest, Southwest, and California regions. These are usually placed over a pit in the earth which serves as a resonator. The Yuman and Piman cultures of Lower California and Arizona frequently beat or scrape a common household basket as a drum substitute.

*Clappers*: Split sticks and hollow wooden clappers are found along the Pacific coast from Alaska to southern California.

*Notched stick rasps*: Predominantly a Great Basin and Southwestern instrument, the rasp (Figure 6) is also found in scattered areas of the lower Mississippi Valley and among several Plains tribes. An inverted basket, a half gourd shell, or a pit in the earth may be used as a resonator. Although rasps are normally made of wood, the Chitimacha Indians of Mississippi used a dried alligator skin.

*Rattles*: For this study the many types of rattles used by the

North American Indians will be divided into two major subdivisions—strung or jingle rattles and container rattles. Only the latter are shown cartographically. Strung rattles are found throughout the United States and Canada, but the most dense concentration is in the area from the Mexican border northward through California and Arizona, the Great Basin, and the Northwest Coast into northwestern Canada. The rattle elements vary from the bird beaks of the Northwest Coast to bones, cocoons, tin jingles, animal claws,

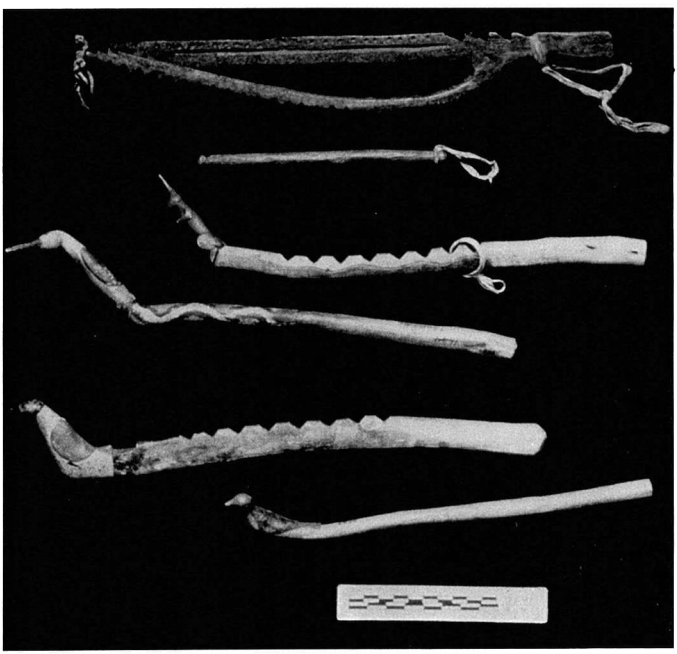
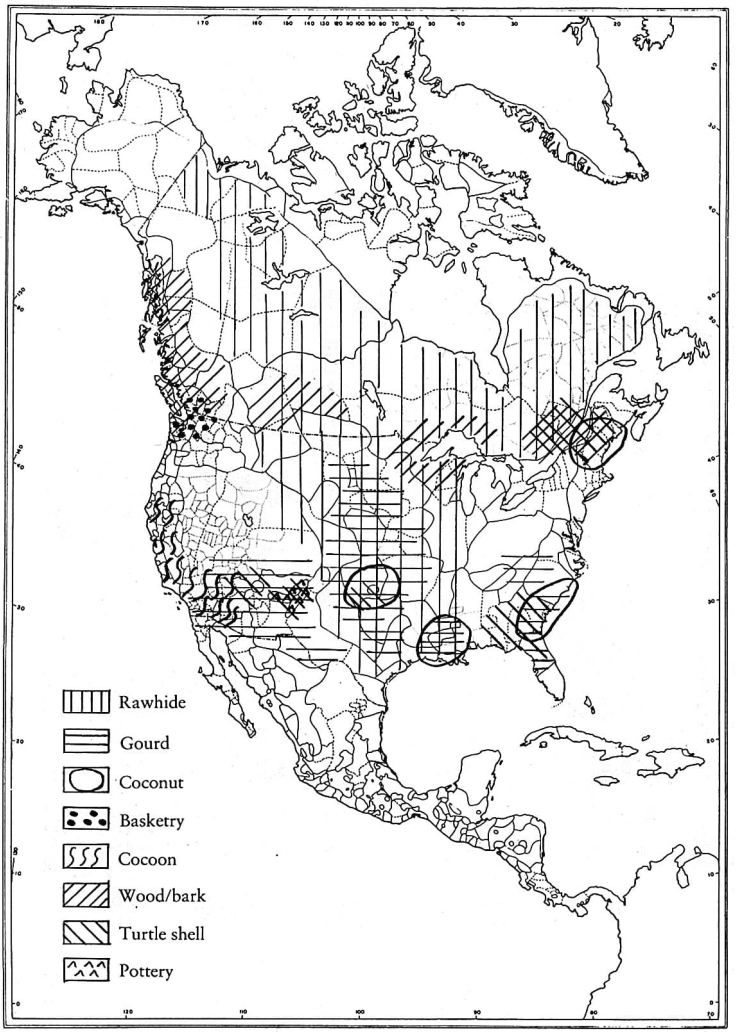


FIGURE 6. Three notched stick rasps made and used by the Indians of Santo Domingo Pueblo. Note the carvings not only on the rasps, but on the scraping stick as well. (National Museum of Natural History Cat. Nos. (top to bottom) 176 376, 360 296, 360 297.)




MAP 5 Container Rattles

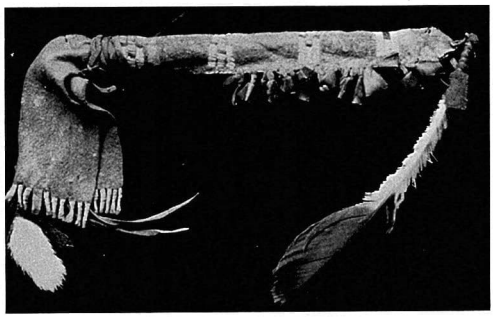


FIGURE 7. Strung or jingle rattle. The rattle elements (pieces of dew claws and hoofs) are suspended from a wooden stick which is covered with hide. This example is from the Arapaho tribe and appears to be a rattle of the Dog Soldier Society. (National Museum of Natural History Cat. No. 165 760.)

rattlesnake rattles, and the very widespread hoof rattles.[15] These rattle elements may be suspended from a stick (Figure 7), cord, or ring, or worn on the body or on clothing. The function of these "instruments," like that of many others, is not always purely musical. They may also be attached to another musical instrument such as a drum or flute or they may be found hanging from a dwelling or ceremonial structure in which the musical performance takes place.

Map 5 shows the distribution of container rattles throughout North America, grouping them according to the material of which they are made. Figures 8–10 illustrate some of these different compositional materials. The container rattles made from either a gourd (southern areas) or from hide (northern areas) are the most prominent types; the other materials are generally substitutes dictated by local environmental limitations. The distribution of this instrument in all of its guises is more widespread than the flute or the whistle, and almost as diverse as the single-headed drum.

15. For a detailed study of hoof rattles, see Harold E. Driver and S. H. Riesenberg, *Hoof Rattles and Girls' Puberty Rites in North and South America*, Indiana University Publications in Anthropology and Linguistics, *Memoir*, IV (1950).

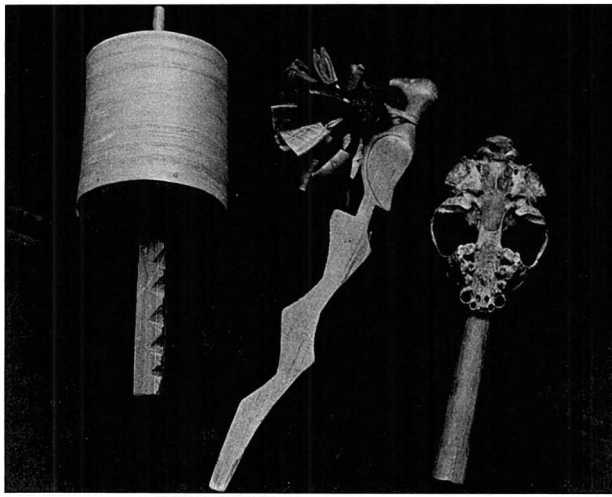


FIGURE 8. Rattles. Three different types of rattles from the Ojibwa culture: (left to right) rolled bark, suspended hoofs, and otter head. (National Museum of Natural History Cat. Nos. 263 230, 178 380, 154 318.)

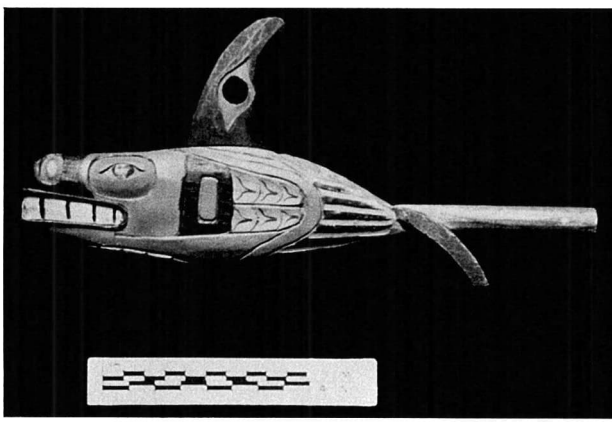
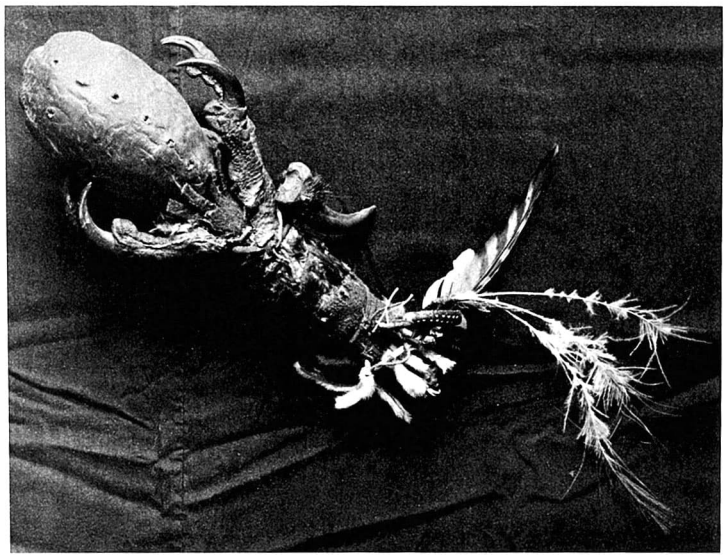


FIGURE 9. Container rattle. A Haida rattle made of hollowed wood. Carved in the shape of a killer whale. (National Museum of Natural History Cat. No. 360 301.)



IGURE 10. Container rattle. A Blackfoot rattle made from a scrotum and framed n two sides by eagle's claws. Note also the bear claw suspended on the right side. Vational Museum of Natural History Cat. No. 360 256.)

The summary given above is brief and general at best. No attempt has been made to be comprehensive; some specialized instruments and sound-producing items have been intentionally omitted.[16] Cartographic displays, as well as the discussion, arbitrarily stop at the United States–Mexico border for the present examples. Nevertheless, we have enough information to allow us to consider possible alternatives for refining the study of musical instrument distribution among North American Indian cultures.

16. Such as whirling discs, animal calls, gourd halves inverted on water and beaten as a drum, cocoon rattles, pottery drums, bells, etc.

Some of the weaknesses of the above discussion illustrate problems involved in collating distribution data. The following ideas should be considered heuristic rather than definitive in pointing out cartographic problems and possible alternative avenues for future investigation. Three issues appear to be of major importance: the problems of taxonomy, historical perspective of the data, and cultural interaction.

Julian Steward states that taxonomy, as any scientific method, "has validity and usefulness as an operational tool only with reference to the problems it is designed to solve."[17] The taxonomy of Hornbostel and Sachs, adopted for the discussion above, is adequate for a general organological classification, such as that used by museums. However, the detailed study of distribution patterns presents additional factors (such as function, design, construction, and performance details) which dictate a need for a more comprehensive taxonomic system.

It is apparent that the categories of chordophones, aerophones, and membranophones may be sufficient for the instruments of these types as used by the American Indians. However, together they probably contain no more than half of the total number of instruments currently in use. A single class, the idiophones, contains almost half of the instruments found today in these cultures. Although these latter instruments have in common the method of sound production, they are extremely diverse in type, construction methods, and materials and, as the literature shows, they are quite different in function as well. Map 5 represents distribution, and therefore classification, of container rattles according to material of composition. This is in no way a unique system as this type of classification has been used by the Chinese for several thousand years.[18]

Similar graphs could be presented for flutes (made of wood, bone, cane, bark, pottery, and metal), trumpets, reed instruments,

17. *Theory of Culture Change: The Methodology of Multilinear Evolution* (Urbana, 1973), p. 79.

18. The ancient Chinese system is based on eight different materials of construction. See Mantle Hood, *The Ethnomusicologist* (New York, 1971), p. 124, and Theodore C. Grame, "Bamboo and Music: A New Approach to Organology," *Ethnomusicology*, VI (1962), 9–14.

drums—in short, for most types of instruments used in North America. Another approach for mapping flutes would be to identify the number of stops or finger holes, which may vary from two to eight or more. Map 4 may also be viewed as presenting a selective type of cartography as it divides the drums into single-headed, double-headed, and kettle drums. A system of classification according to method of playing the instrument should also be investigated. Is the musical bow beaten, plucked, or rubbed? Is the flute end-, side-, or nose-blown; the drum struck with a stick, a bone, or the hand; the rattle shaken in a continuous circle, in vertical, separated strokes, or in some other fashion?

Classifications and graphs based on the functions of the instruments must also be developed before a thorough analysis of the relationships of musical instrument distribution to the overall cultural situation can be evaluated. Are gourd rattles and kettle drums used in the Plains solely for Peyote celebrations? Is the bullroarer used to control the weather or to assemble people? For curing? For other magical or ceremonial purposes? Or just as a toy? How are certain rattle types related to specific ceremonies?[19]

The relation of the composition of a musical instrument (i.e., its form) to its function is also integral to the establishment of a distribution pattern. Steward initiates the term "form-function" which he defines as a key concept in cross-cultural studies.[20] Although it is known that certain instruments of the same form have entirely different functions in different cultures, and that instruments of very different forms serve the same function in different cultures, a detailed study of this type of relationship is presently lacking for North American Indian musical instruments. Such a study, besides helping to define the limits of the taxonomic structure, would also aid in understanding the historical development of these instruments.

The second problem of major importance is the arrangement of the data in proper historical perspective. It should be noted that, in the distributions discussed above, it was said that "the 'Apache-

19. One attempt to describe a correlation between instrument and ceremony was made by Driver and Riesenberg (cited above, note 15).

20. *Theory of Culture Change*, p. 91.

fiddle' . . . was and is found." Although not completely ambiguous, this statement illustrates clearly the correlation of spatial-temporal perimeters. Where *and* when was the instrument found? Since the graphs on which the present maps are based gave no indication of time relationships, the space distributions must also be considered extremely inadequate. In order to establish a complete distribution pattern three major sources must be consulted: the available literature, museum specimens, and contemporary fieldwork; and each of these must be evaluated for its reliability and potentiality as a data model for the study.

### *Literary Source Materials*

The majority of the data present in the literature will be found in chronicles of early explorers, ethnographic publications (including contemporary ethnomusicological monographs), and in archaeological reports. The value of these last is frequently overlooked; several papers dealing with individual "finds" in the Southwest have been written,[21] but these rarely relate the specimens to the ethnological literature or to present distribution. Many archaeological publications are not indexed in a manner which helps the researcher to locate musical specimens, and frequently specimens are misidentified. Nevertheless, their aid in establishing a complete historical perspective is indispensable. The only major complication in this area is the high instability of many types of musical instruments. Frequently the only instruments remaining in archaeological sites are those made of stone, bone, or pottery, thereby presenting a somewhat inaccurate picture of prehistoric Indian instruments.

The chronicles of early explorers are often unreliable, as the writer frequently takes an uncritical view of the society which he is describing. Musical instruments may be described in a manner which does not allow precise identification. A source which describes a culture as possessing a notched stick rasp, eighteen inches long, rubbed with a coyote shoulder blade while supported on an inverted basket resonator, will provide more accurate and more

21. Donald N. Brown, "Ethnomusicology and the Prehistoric Southwest, *Ethnomusicology*, XV (1971), 363–378, lists about forty such sources.

detailed information than a second source which simply states that the Indians sang to the accompaniment of a notched rasp. Both sources may be of value, but in proportion to their reliability and content. Neither will be as helpful as a documented interview with the player of the rasp in which he describes tribal terminology associated with the instrument, methods of construction, function within the tribal religion and other pertinent data. The accuracy of any source, especially early reports, must be held to be questionable in relation to information available from additional sources.

Table I provides a chart which can be used as a guide for evaluating ethnographic literature as well as a guide for future fieldworkers in compiling data about musical instruments.

## *Museum Sources*

The holdings of various museums[22] present a second major source for organological data. Both archaeological and ethnological specimens help to determine the overall historical development and distribution of musical instruments. Some museum specimens collected in the early nineteenth century, when compared with items recently seen on reservations, show remarkably different materials and methods of composition. Others indicate that the same materials and methods have been used for two centuries or longer. Unfortunately, museum specimens also have their limitations. Although modern electronic equipment makes possible the accurate measurement of specific pitches of museum artifacts, the researcher should be aware of the limited value of such measurements. For example, the tonal system of a non-Western culture frequently does not make use of all the possible tones that a musi-

22. See "Instrumentensammlungen" in *Die Musik in Geschichte und Gegenwart*, VI, cols. 1295–1310, for a listing of museums with particularly strong instrumental collections. See also William Lichtenwanger, *A Survey of Musical Instrument Collections in the United States and Canada* (Ann Arbor, 1974). For further information concerning the relation of museums to anthropological studies see William Sturtevant, "Does Anthropology Need Museums?" *Proceedings of the Biological Society of Washington*, LXXXII (1969), 619–650; and the same author's "Museums as Anthropological Data Banks," *Proceedings of the Southern Anthropological Society*, VII (1969): *Anthropology beyond the University*, ed. A. Redfield.

## TABLE I
## Musical Instrument Documentation Chart[23]

Culture: Location: Date:

Musical Instrument:

Name: Native: Alternate names:
English: Archaic names:

Physical description (general discussion of the physical appearance, dimensions, decorations, etc.—drawings and photographs are helpful).

Use: Ownership (specific markings, group vs. individual, etc.);
Performers (age, sex, specialization);
Specific usages (names of ceremonies, genres of songs);
Function (specific results obtained, obligatory or optional);
Conditions of use (time of day, place, frequency, total number of instruments and time played);
Performance methods (body and instrument placement, method of sound production);
Storage and preservation (between usages).

Construction:
Materials used (local and scientific terminology);
Methods (sources of material, treatments and preparations, tools used, etc.);
Manufacturers (specialists/nonspecialists, sex).

History:
Specific instrument (where, when, how obtained);
Generic information (use within the last fifty years, at the turn of the century, at time of contact, precontact, origins and myths);
Modifications and substitutes.

Occurrence (number of instruments presently available or in use):

Repair (what, how, when):

Manner of discharge:
Average length of service;
Actual disposal (when no longer useful, at death of owner).

23. Based on Harold C. Conklin and William C. Sturtevant, "Seneca Indian Singing tools at Coldspring Longhouse," *Proceedings of the American Philosophical Society*, XCVII (1953), 262–290, and Sturtevant, *Guide to Field Collection of Ethnological Specimens* (Washington, 1969), with additions by this author.

cian trained in the European tradition can produce from a six-holed flute. Thus the musical style of the culture, where known, must be taken into consideration. The physical condition of museum specimens may also be deceptive. Even under the best storage conditions certain functional parts or items of decoration may deteriorate, making difficult a complete study of the instrument. The collector sometimes brings the museum an inferior specimen; more frequently he brings inadequate documentation concerning the artifact as found in its native culture. Despite these shortcomings museum collections and their catalogues are a significant aid in establishing the complete historical perspective of distribution patterns.

### *Contemporary Field Studies*

It has already been mentioned that the historical concept can be completed only by including data about the present state of musical instruments in use among the North American Indians. As the social and religious culture of each tribe is constantly evolving, so too must their material culture be changing. The need for contemporary fieldwork is obvious, and studies such as that by Conklin and Sturtevant have yet to be made for most cultures. A complete distribution pattern can be established only when detailed information such as that outlined by Table I is available for every culture.

Historical considerations indicate that one series of space distributions will not suffice. Additional graphs, prepared on a temporal basis, must be evolved. At least the following points should be represented: a time before contact with white men; the time of contact (which may vary as much as a hundred and fifty years from culture to culture), the late nineteenth century, and the present. These temporal periods may need further subdivision as additional evidence is determined.

Parallel to the problem of time-space relationship is that of cultural interaction. This includes contact (both white/Indian and Indian/Indian) and migration, and the influences of these phenomena on cultural element diffusion. The methods for dealing with this problem are not simple nor are they unique. They include com-

parative studies of linguistics, artistic decoration, function of instruments, techniques of manufacture and performance, and recent influences of acculturation.

### *Linguistic Comparisons*

A significant number of tribal language studies are available to enable the researcher of musical instrument distribution to determine whether parallel lines of contact and migration exist.[24] The exchange of native terminology through loan words and replacement loan words can help to trace not only the distribution of the instruments, but perhaps the movement of the function and usage as well.[25] In this regard, the use of a tool as simple as a dictionary of tribal languages[26] can give many insights into the concepts of native terminology. A single example from the Papago Indians of Arizona will suffice. The Papagos traditionally use a common household basket as a drum substitute.[27] Saxton gives the term "tamblo" as the Papago word for drum.[28] This is a loan word from the Spanish—"tambor." Upon further examination it can be established that this Papago word refers to the modern hide drum rather than to the native basket drum which has its own complete terminology. These terms relate to the method of playing the instrument (i.e., beating or rubbing the drum with the hand or a

24. For a discussion of the limitations of this method see Erland Nordenskiöld, *Modification in Indian Culture through Invention and Loans*, Comparative Ethnographic Studies, 8 (Göteborg, 1930). See also Nordenskiöld, *Deductions Suggested by the Geographical Distribution of Some Post-Columbian Words Used by the Indians of South America*, Comparative Ethnographic Studies, 5 (1922).

25. To my knowledge there are few studies based on the terminology of musical instruments; among them are Helen E. Hause, "Terms for Musical Instruments in Sudanic Languages," Supplement 7 to the *Journal of the American Oriental Society*, LXVIII (1948), and, to a lesser extent, much of the work of Curt Sachs.

26. Such as John P. Harrington, *Vocabulary of the Kiowa Language*, Bureau of American Ethnography, Bulletin 84 (Washington, 1928); Dean and Lucille Saxton, *Dictionary* [Papago-Pima to/from English] (Tucson, 1969); Leon Wall, *Navajo-English Dictionary* (Lawrence, Kansas, 1958).

27. Mary Lois Kissel, "Basketry of the Papago and Pima," American Museum of Natural History, *Anthropology Papers*, XVII (1916), 176; Frances Densmore, *Papago Music*, Bureau of American Ethnography, Bulletin 90 (Washington, 1929), p. 3.

28. *Dictionary*, p. 66.

stick) and its function within the Papago culture, and they are not loan words. Additional studies of this nature are sure to reveal more data about the thought patterns of the North American Indian.

### *Artistic Decoration*

Boas' study of Northwest Coast art[29] is especially useful for the study of artistic decoration on musical instruments. American Indian decorations vary from the elaborately carved wooden rattles of the Northwest Coast (Figure 9) and the highly ornamented flutes of the Kiowa and Sioux to the occasional instrument with little or no decoration. Many decorations may be traced to specific designs used in conjunction with certain ceremonies (as the Peyote bead design found on rattle handles) or used by specific tribes. The relation of specific instrumental decorations to ceremonial functions or geographical areas may in time help to establish cultural diffusion patterns. Another link between art and musical instruments is the dummy flute made by the Hopi and used in certain ceremonies to simulate the real flute.[30] A functional approach to artistic examination may help to answer questions concerning the manufacture and use of this fake instrument.

### *Function*

A functional approach to the examination of material culture is certainly not a new idea, but some investigation of its relation to musical instruments may prove helpful here.[31] A simple bone whistle can serve to illustrate the complexity of such an approach. Of what purpose is the whistle to various cultures? Is it designed for communication or signaling? An instrument to contact the powers of a spirit or even death? What role or roles does it play in the sun dance and other ceremonial dances? Does it have a musical purpose

29. Franz Boas, *Primitive Art* (Oslo, 1927; reprinted New York, 1955).

30. Further information on some of these flutes may be found in my forthcoming catalogue of the American Indian instruments of the United States Museum of Natural History of the Smithsonian Institution.

31. Driver and Riesenberg's study of hoof rattles (cited above, note 15) is an example of this approach.

or is it a choreographic device? Was it introduced to this dance by Ohamagwaya or might it be a "holdover" from earlier rites? How might Ohamagwaya's early contacts with Spanish and Pueblo peoples have influenced his use of the bone whistle? As the answers to these questions will probably vary from culture to culture, what appears to be a simple single-toned instrument becomes part of a complex cultural situation.

### *Manufacturing and Performance Methods*

Details of manufacture are more readily documented than are performance practices, but both are significant for an understanding of an instrument's relation to its culture. What, if any, implications can be drawn from the fact that certain Indian cultures cut their flutes in half and scrape them hollow while others burn out the central cores? Why do some groups drill open the flute stops and others burn them open? What connection is or was there between these cultures? When answering questions such as these, additional problems concerning the value systems of each culture develop. Of what value is the instrument and its manufacturer to the society? How can the manufacturer alter the worth of an instrument? What are the sex roles of the builders and performers? What may be the effects of intermarriage or, conversely, contact avoidance on instrument production and distribution?

Environment also influences the manufacture of cultural items. A notable example of this influence is the general lack of hide drums in the Sonoran Desert where skins are not readily available. There baskets or other objects (such as cardboard boxes today) are substituted to provide a drumlike percussive accompaniment. This environmental influence is also shown by the use of so many varied substances from which container rattles are made.

### *Recent Influences of Acculturation*

The effect of acculturation and other recent changes is an additional aspect of the problem of cultural interaction. To cite an example: it is not known when the first metal flute was produced by an Indian—probably from the barrel of a broken gun. However, it is not uncommon today to encounter flutes made of aluminum

tubing or from gas pipes as well as from gun barrels. Do these metal instruments serve the same function as their wooden or cane counterparts? Is the sound considered to be the same or of equal quality? How were they constructed? The same questions may apply to the use of the modern bass drum by Plains cultures today. And what of the evaporated milk can rattle, the cooking pot drum, the sewer pipe water drum, and other "modern" inventions? Only by securing answers to these questions can the full impact of white contact be determined. The effects of recent intertribal contacts such as the spread of the Peyote cult, large modern "pow-wows," and other "pan-Indianisms" are also influencing the distribution of musical instruments today.

Although additional problems such as the influences of demography, cultural syncretism, the impact of the horse, and other seemingly unrelated topics are not discussed here, they will all need to be considered before complete data can be assumed to be available. Only when representations of all these variants are available, presented in historical perspective and within an adequate taxonomic system, can a detailed distribution pattern be prepared.

Without complete knowledge of a final study it is impossible to do more than speculate about the overall contributions of such research. It seems probable that the results will contribute beyond the obvious organological and musicological limits. On a broad level it may be possible to support or oppose the concept of North America as one large culture area. Maps 2 through 5, limited though they may be, tend to support a widespread distribution of the single-headed drums, container rattles, flutes, and whistles. These instruments exist throughout North America extending to almost every geographical boundary. In contrast to this homogeneous distribution, the instruments of South America show a much more heterogeneous pattern indicating a less stable collective cultural area.[32] Alan Lomax, in *Folk Song Style and Culture*, also

32. See Izikowitz (above, note 1), and Erland Nordenskiöld, *The Changes in the Material Culture of Two Indian Tribes under the Influence of New Surroundings*, Comparative Ethnographic Studies, 2 (Göteborg, 1920).

suggests that North America is one large cultural area.[33] He further suggests that there are many similarities with the eastern Siberian area. Relevant organological research should be pursued in this area to see whether items of material culture, such as musical instruments, reflect the same indications. Present studies also show the North American area to be distinct from that of the African area which has developed a widespread use of complex drum rhythms and the use of the musical bow but with less emphasis on the rattle.

As more of the details of North American Indian musical instruments become available, the hypothesis of one culture area may be weakened. Methods of construction, performance, function, etc., may be seen to be distinctly different from tribe to tribe and area to area. Such findings would support the widely held theory of several musical culture areas.[34]

Interesting comparisons can also be made with maps of other items of material culture and sociological traits such as those presented by Driver.[35] For example, how does the sexual division of labor in horticulture and subsistence pursuits compare with the division of labor in building and playing musical instruments?[36] What conclusions can be drawn from a comparison of the materials used in producing musical instruments with the materials used in various areas for housing and clothing as mapped by Driver? Is there a relationship between the containers and vessels used for cooking and storage and those used for container rattles and drums? Does the appearance and movement of the gourd rattle and kettle drum coincide with the diffusion of the Peyote cult?

33. (Washington, 1968), pp. 85–87. Note that Lomax is analyzing singing and song styles rather than instrumental performance styles or musical instruments.

34. A theory expressed by Bruno Nettl in *North American Musical Styles* (Philadelphia, 1954) and in "Musical Areas Reconsidered: A Critique of North American Indian Research," *Essays in Musicology in Honor of Dragan Plamenac*, ed. Gustave Reese and Robert J. Snow (Pittsburg, 1969), pp. 181–189; this theory is generally supported by many scholars, notably Harold E. Driver, in *Indians of North America*, 2nd ed. (Chicago, 1969).

35. *Indians of North America.*

36. See Alan Lomax, *Folk Song Style and Culture* (Washington, 1968), for a similar discussion of cross-cultural song style variance and its relation to subsistence type and work team organization.

What, if any, is the connection between craft specialization as graphed by Driver and the playing or manufacturing of musical instruments? What implications can be drawn by comparing kinship relationships, residence patterns, and linguistic data with a thorough musical instrument distribution pattern? Few of these questions can be answered today owing to lack of organization of the ethnological, archaeological, and other available data; but their answers will help to establish the role of musical instruments within the total culture of the North American Indians.

What might seem to be a relatively simple undertaking is a task which will require many years of thorough research. Most important, a refined taxonomy must be developed. Then maps prepared from ethnological and archaeological sources, museums specimens, and present-day reservation and nonreservation situations must be compiled. Finally, and perhaps most important, the musical styles in which the instruments perform must be analyzed and compared. That this work is needed is proven by the lacuna of comparative information available today on the distribution of musical instruments among North American Indian cultures as well as other folk cultures.

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