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NAVAJO INDIAN MEDICAL ETHNOBOTANY

By

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1. Wooton and Standley, 1915.

LITERATURE

There are scattered references to the use of plants in many of the papers on the Navajo*[2] but the only considerable lists of Navajo names for plants, together with species identifications, are in a paper by Matthews and in the works of the Franciscan Fathers.[3] Matthews gave 112 Navajo names (ninety-two of which we have confirmed), with 104 specific and two additional generic identifications. The Franciscan Fathers gave about 387 Navajo names. Of these about 244 were identified to species, forty-five were relegated to genera, and seventeen to families only, twenty-nine were for introduced domesticated plants, and fifty-two were unidentified. Where an identification was made, only a single species is given for each Navajo name. We now know that, ". .. there are several sub-ethnic units represented in the Navajo area"[4] so that local and individual variations in naming plants are to be expected. Moreover, there is individual variation in the use of the several types of names and variation in the assignment of botanical species to them (v.i.). Strict adherence to the previously published lists, therefore, may lead to erroneous conclusions.

MATERIAL AND METHODS

The material for this analysis consisted of over 1,200 specimens of plants, belonging to eighty families, 286 genera, and 515 species. Each specimen was named and its medical uses explained by from one to four informants.[5] Only plants used in medicine were collected since others have published lists of plants used for food,[6] dyes,[7] or other economic purposes.[8] Most of the field material was obtained by Wyman during the months of June, July, and August of 1933, 1934, 1935, 1937, and 1938, from informants in the Pinedale-Coolidge-Smith Lake, New Mexico, region. We were kindly allowed to use data and 167 specimens (comprising 128 species) obtained by Dr. Clyde Kluckhohn and his co-workers, Mr. Harry Tschopik, Jr., and Miss Flora L. Bailey, from informants in the Ramah-Atarque, New Mexico, area.

Except for fifty-one specimens from the vicinity of Chin Lee, in the east central part of Apache County, northeastern Arizona, the plants were collected in the southeastern part of the Eastern Navajo Jurisdiction and adjacent country, which lies along the southern border of McKinley County, the northern border of Valencia County, and eastward to the western part of Bernalillo County, New Mexico. This country is one of considerable physical variability, lying at an average of seven thousand feet above sea level.[9] On the whole, it is semi-arid desert or xerophytic forest (zones of sagebrush and greasewood or pinyon and juniper),[10] but the Navajos often go to the coniferous forests of the mountains (zones of yellow pine or Engelmann spruce), along the streams of the mountain valleys, or to lower altitudes (zone of cottonwood, cactus, and yucca) to get plants. Data were obtained by going into the field accompanied by an informant and an interpreter (if necessary), collecting the plants designated by the informant, and recording the names and uses of each specimen, usually at the end of each day's work. The Navajo often travel long distances on horseback to obtain certain plants that grow only in limited localities. One gets the impression that the curative value of a plant, and certainly its monetary value, are enhanced by difficulty in collection.

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*In accordance with the established policy of the University of New Mexico Press, the author has consented to adopt the Spanish spelling of Navajo, rather than his preferred form, Navaho.

2. See Kluckhohn and Spencer, 1940. p. 26.
3. Matthews, 1886; Franciscan Fathers, 1910, 1912.
4. Hill. 1938. p. 3.
5. Over seven hundred specimens were discussed by two or three informants other than the one who had collected them. This, together with the data for duplicate species, gave ample cross checks.
6. Castetter, 1935; Yanovsky, 1936; Bailey, 1940,
7. Amsden, 1934: Reichard, 1936.
8. Mr. Harry Tschopik, Jr., has monographs on Navajo pottery and basketry in preparation, and Dr, Paul Vestal is conducting a study of the economic Ethnobotany of the Ramah-Atarque area.
9. See Gregoory, 1916; Hill 1938. pp. 11-14.
10. For zones of vegetation see Gregory, 1916, pp. 72-73.

The Navajo appear to have good memories for the exact places in which to find certain species, and will often lead one to an isolated station many miles from their homes. They also have a good sense of the type of locality in which to look for certain species, showing that they recognize to some extent the relations between species and habitat.[11]

Plants for medicine may be gathered in any place, but certain precautions must be taken in collecting them. A plant of the desired species is located and a song is sung over it. Then corn pollen is placed upon it in ceremonial order (see under life medicine) or jewels (turquoise, shell, jet) are "given" to it. Finally, a prayer is said to it and then the collector leaves it, walking around it sunwise, and gathers plants of the same species in the vicinity. "If you do not give something you might hurt the plant or the earth." "Do not pick up an arrowhead while collecting plants, for it might have been given by a previous collector." "You must ask permission of the plant or the medicine will not work."

"Plants are alive; you must give them a good talk." "It is dangerous to gather certain plants (e. g. Rhus canadensis, var. trilobata) unless you have had the ceremonial in which they are used, for you might get the disease associated with that ceremonial."

The Navajo seem to have some notion of conservation, for informants gathered only as much of any species as they needed at the time, even when they had traveled a long distance to find it. Only one instance of the transplantation of wild species was observed. An herbalist from near Smith Lake, New Mexico, had transplanted Nicotiana attenuata from the Zuni Mountains to an old corral near his home.

Sixteen informants from the Pinedale-Coolidge-Smith Lake, New Mexico, region and one singer from Chin Lee, Arizona, were employed. Among these were eight singers, three herbalists, two curers, one diagnostician, and three of the laity (one a woman) who knew about plants because there were singers or herbalists in their families.[12] Except for the one woman, all were adult males. One of the singers, one of the lay informants, and one other young man (an apprentice) served as interpreters for the others at different times. The data from the Ramah-Atarque area were obtained from twenty-eight informants, but chiefly from six or seven of these.

The botanical knowledge of informants is variable. In general, herbalists know the largest number of plants (sometimes over three hundred species) while singers usually know the ones for the ceremonials they conduct and a few other common species (perhaps a hundred or so in all). The knowledge of others depends upon their interest or associations with practitioners.[13]

Our modern system of classification of organisms probably had its origin in the generalizations concerning plants made by the early herbalists, generalizations arising from the need to place in convenient groupings, plants of supposed medicinal value. The economic botany of present peoples who are not familiar with the Linnean system offers us similar, but living, examples of such first steps in the evolution of a natural classification. There is an extraordinary similarity between the names for supposedly allied plants in the works of the pre-Linnean herbalists, such as Gerarde's herbal of the sixteenth century, and many of the Navajo names for plants.

Matthews, in 1886, found that the Navajo "are not devoid of generalization among allied species" and that "in some cases this generalization agrees with our own,"[14] and gave three or four examples.

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11. No attempt was made to learn all their idea. about botany but the following notes are of interest. "Plants have different strengths to grow (like animals) so they grow to different heights. When a plant has grown as much as it can it starts the flowers. Then wind, air, and moisture make pollen and seeds. Seeds fall to the ground and bring more plants. The roots serve as an anchor (feet), give food to the plant, and suck up moisture from the earth (rain). The leaves furnish food for the plant. They change color in the fal1 when they get ripe. Frost causes them to fall. Pine leaves do not fall because the pitch keeps the moisture in. The bark retains moisture. Thorns are protective."

12. For definitions of terms for personnel see Kluckhohn and Wyman, 1940, pp. 13-18.

13. Iroquois plant concepts, collecting practices, native taxonomy, etc., show many extraordinary parallels with the Navajo. See Fenton, 1940.

14. Matthews, 1886, pp. 767, 768

We have found the same; for, as one informant told us, "the Navajos are great categorists." The Navajo classify plants in at least three separate ways. When asked if plants are related in the same way that people are related, informants have replied, "Yes, first, plants are male and female. Another relation is that various groups are used for curing the same disease or for the same purpose, or are used in the same way. Still another is that they have similar characteristics, such as being prickly or sticky, and within these groups there are large, medium, and small or slender kinds." These three types of category are independent, except that when plants are named accord-
ing to size the larger one is likely to be "male," while the smaller one is "female." They form, however, classifications within classifications, physical characteristics or "sex" being used to distinguish plants within a usage group. We shall call these three quasi-independent categories: *sex, Navajo family*, and *Navajo genus*.[15]

SEX

The conception of sex enters into nearly every field of Navajo ideology. There are male and female branches of many ceremonials, male and female items of ceremonial equipment, male and female rains or other natural phenomena. Likewise some or all plants (according to different informants) are male and female. The two are "almost alike but the leaves are a little bit different. None are exactly alike." The "male is bigger and the female is smaller." When plants that have leaves which are "alike" are named according to size, "the big one is usually male, the smallest one female." The Franciscan Fathers mention "male medicine" and "female medicine" and say that the designation is due to the use of these plants in male and female branches of Shooting Chants.[16] These names are probably generalizations about sex rather than specific Navajo names for the botanical species given.

The Navajo differentiation does not coincide with biological sex. By coincidence the male and female of a pair are sometimes large and small species of a single genus, sometimes two superficially similar species in widely separated genera, and occasionally large and small specimens of a single species. The following examples will serve to illustrate this.

Male-*Medicago sativa*, female-*Medicago lupulina*; male-*Cirsium pulchellum* (large specimen), female-*Cirsium calcareum* (small specimen) ; male-Pentsemon strictus, female-Sisymbrium linearifolium; Part I, Nos. 12 and 13.

A few of our informants paid considerable attention to the sex of plants, always designating the best known male and female plants, while the others seldom mentioned it unless asked.

NAVAJO FAMILIES

The Navajo think of plants as falling into large categories according to their use (purpose or method). They have names for these categories and if an informant cannot recall the specific name for a plant he will designate it by the group name, much as we might call a plant "hardwood," "evergreen," "rock garden plant," or in the case of medicinal herbs, "cathartic," etc. They regard the species in a category as being definitely related in some way, although the same species may sometimes belong to more than one category. In a few instances, these groups do contain a number of species from the same botanical family, although this is because they have similar morphological or pharmacological properties. There appears to be no definite number of Navajo families, nor of species belonging to anyone family, the number given by anyone informant depending upon the extent of his botanical knowledge. Since there are probably as many families as there are well known uses, and since there are no fixed relations between families and classification by characteristics, no attempt was made to obtain a complete list of families, nor to allocate the Navajo names in Part I to them.[17]

15. These terms, when used to refer to these Navajo categories, will appear in italics; when not italicized they refer to the orthodox scientific terminolgy.
16. Franciscan Fathers. 1912, vo1. 2, p. 44.
17. Fifty-six *family* names were recorded, examples of which may be found in Part III, under the various uses. See also Kluckhohn and Wyman, 1940, pp. 48-57, for the “medicines” used in most ceremonials, the names of which are applied to groups of plants used in them.

A *Navajo family* may be named for the ceremonial in which the constituent species are used; the etiological factor held responsible for the disease treated with the herbs; the disease or disease group itself (a disease is occasionally named for an etiological factor, see Part III, rheumatism); the supposed pharmacological effect of the herbs; the method of preparation for use; the method of administration. *Family* names may also be combinations, especially the names of ceremonials for which the constituent species are appropriate followed by the name of an etiological factor, a pharmacological effect, a method of preparation, or a method of administration.

NAVAJO NAMES FOR PLANTS

Names for plants which are widely known and accepted by the Navajo consist of (1) those for single botanical species or small groups of botanically related or superficially similar plants (*Navajo species*), and (2) those used to designate a number of botanical species, no one of which (except occasionally v. i.) can be considered a basic species[18] for the group (*Navajo form genera*).[19] Collectively we shall call these (1 and 2) stem names.

Some *stem* names are never (or seldom) qualified to fit related plants. Others may be modified by additional qualifying terms to designate species which resemble or are allied to the species designated by the unmodified name (Navajo varieties).

A group composed of a stem name and its varieties we shall call a Navajo genus.[20] In each *genus* there are seldom more than three or four varieties, often only one or two which are widely known or recognized. An informant, however, may "make" additional varieties to suit his fancy (individua1 varieties). Informants vary in this respect, some using only the well-recognized terms, while others seem to delight in splitting the genera into varieties, sometimes never using the stem itself without qualifications (as do certain "white" botanists).[21] Large and small specimens of one species of one botanical genus. especially in a form genus. In a surprising number of instances, the species in a Navajo genus are actually members of the same botanical genus, or at least of the same family. although this is not always so.

Of the 243 stem names in Part I, forty-four are probably *form genera*. Botanical species which have no specific names but which resemble one another in certain respects, e. g. color (9), may be placed in form genera. It is peculiar that so many of the stem names referring to color are form generic.

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18. A single or a limited number of botanical species, exclusive of other plants, to which a given Navajo name is usually applied.

19. Such names are not the same as *family* names, since they usually refer to physical characteristics rather than to uses. The distinction, however, is subtle, and sometimes difficult or impossible to make since, by usage, some *family* names have come to be used to designate a more limited group of species than the term *family* would imply.

20. It would be confusing to call the *stem* names *generic* names, since they do refer to definite botanical species. The situation is as if in our binomial system the generic names were used alone for the best known species of a genus, while binomial terms were used for all other members of the genus.

21. We have recorded 341 *stem* names and 245 *varieties*, but only 243 *stem* names and sixty-three *varieties* are given in Part I. *Individual varieties* (unconfirmed by other informants or by other authors-139) have been omitted. Likewise we have omitted 133 *stem* names given by single informants and unsupported by data from other sources (unicates). Of these, sixty-one may be established as names for *basic species* by future field work, but seventy-two seem to be purely descriptive, individual characterizations of doubtful validity. Navajo botanists, especially herbalists who are proud of their botanical knowledge, are not loath to manufacture names to fit a specimen when they cannot give an accepted name.

Other species which are basic for one or more specific names may also be included in form genera in which they fit well.[22] For some species, this practice may be local or individual. Occasionally (twelve cases) a form genus may include one or two botanical species which may be considered basic for the group.

BASES OF NAVAJO PLANT NOMENCLATURE

The majority of Navajo names for plants are frankly descriptive. They may begin with the word ?aze-?- medicine (33 of the 243 stem names in Part I) or c'il-plant (17). These two terms are often used interchange-ably. According to informant A, the term ?aze'? should be rendered "herb" when it is part of a plant name, while independently it has two meanings, "herbs in general" or "medicine." To avoid confusion we shall render it "medicine." Descriptive names refer to some physical characteristic of the plant or some part of it (seventy-eight item- names), e. g. color (23), shape (8), odor (7), size (6), taste (4), or some other characteristic. (sticky, sharp, etc., 30); to resemblance of the plant to some object, e. g. rattle, basket, hair, etc. (12); to its habit, e. g. winding, erect, etc., or its habitat with relation to rocks, water, or trees (20). In numerous names, the description is made more specific by including the name of the part concerned, e. g. flower, root, stem, leaves, bark, or seeds.[23]

Many names link the plant with some animal (44), referring to it as the animal's food (15), [24] comparing it to some part of the animal or indicating some other association (29).

Some names refer to the use of the plant (32), e. g. its economic use (9), pharmacological effect (8), ceremonial use (9), or the disease for which it is a remedy (6). The remaining names (57) might be considered strictly botanical. Some of these are descriptive, referring to physical characteristics, resemblances, use, etc., but through usage they have received definite botanical connotation, while the etymology of others is obscure.

Eighteen *stem* names which refer to uses or animals appear to be *family* names which by usage have come also to be specific (9) or form generic (9) names. They are used to designate one or a limited number of plants when used as a stem name, but a larger number when used as a *family* name (see footnote 19). An informant may use one of these in either sense.

SUMMARY

Sex, Navajo family, Navajo genus: the three quasi-independent categories for plants according to "sex", use characteristics.

Navajo species: names for definite botanical species or small groups of closely related species (basic species),

Form genus: names for a variety of superficially similar similar plants (but more limited than families).

Stem names: species and form genera collectively.

Varieties: stem names qualified to fit related plants.

Navajo genus: a stem name together with its varieties.

Sex may apply to any plants, independently of other categories except that large and small *varieties* may be male and female.

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22. This, together with the facts that more than one botanical species may be *basic species* for the same Navajo name and that the same botanical species may be a *basic species* for several Navajo names, makes it obvious that data must be extensively cross-checked and based on a fair number of specimens to be reliable.

23. There is a considerable range in the phonetic details of the qualifying adjectival terms (especially those referring to color). Thus for "gray" one hears: labahi, labahigi, laba?I, laba?igi, lbahi, libahi, lbai, ba?I, etc. These variations represent choice between nominalizing and relativizing enclitics, contraction and sandhi forms, and other products of free variation in accord with general laws of Navajo phonology. The precise incidence of such alternatives can be of great interest to the linguist but for our purposes they are irrelevant. We have, therefore, given in Part I only the form which our informants used most commonly in each case. But it is in the nature of the case that other investigators have (perfectly correctly) recorded slightly different forms for the same plant.

24. See Sapir, 1936.

Families are composed of definite genera or species only in so far as these may happen to correspond in use. Family names may be modified to make family varieties. Family names may occasionally be used as stem names to designate fewer species.

Since informants may name plants according to anyone or a combination of these categories, botanical data gathered by different field workers without extensive cross-checking with independent informants may vary widely.

NAVAJO NAME LIST

The Navajo names for plants are arranged alphabetically and numbered consecutively. The numbers of varieties are italicized and indented, to distinguish them from those of stern names, so that the genera may be seen easily. Each name is followed by a free English rendering. In the case of varieties the item name is not repeated but only the qualifying-word or phrase which should follow the stem name, and its English rendering, are given (preceded by dashes which represent the position of the stem name). Following the name are the pertinent botanical species, their standing being indicated by the following conventions.

B.S. (Basic species) The first botanical name given is the species to which the Navajo name is usually applied, at least in the areas studied. Other species so designated which are not distinguished by the Navajo (usually in the same botanical genus) follow, set off by commas. If more than one species are recognized by the Navajo as botanically different but are of equal standing as basic species for the name each is preceded by B. S. Species which are regularly designated by the name but are not quite so widely recognized as the basic species are preceded by B.S. 2 (secondary basic species). A number in parenthesis following a botanical name is the number of identifications of that species for the Navajo name made by independent informants.[25]

FORM GEN. The *stem* name is that of a *form genus*.

M or F: A Navajo name which was listed by Matthews or the Franciscan Fathers[26] is indicated by M or F (or both) in parenthesis. When they did not give a botanical identification, this follows the rendering of the Navajo name. When they did, it follows the basic species, without comment if their identification agreed with our own, followed by G if they gave the same genus but no species identification, accompanied by their identifications if different from ours. In certain instances our estimate of the probable standing of identifications which were different from ours is indicated by genl., conf_, or mist_ (See footnote 25_)

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25. Other species are often designated by a given name for the following reasons. A name may be applied to plants other than the *basic species* which belong to the same *Navajo genus*, resemble it superficially, or are otherwise associated with it (generalization). This may happen when the specimen is of a species not usually collected by the informant and is not recognized as being botanically different, or when the information may not be familiar with the name of a variety and may designate it by the *stem* name alone. Species other than the *basic species* are often confused with it because of some actual resemblance, or because the specimen is sterile, or otherwise hard to identify. Also even the best informants may make mistakes which cannot be condoned by confusing resemblances. In our field notes we have 247 such identifications, of which seventy-two re probable generalizations, 125 are confusions, and fifty are mistakes. This illustrates the danger in accepting data from a single informant as final.

26. Matthews, 1886; Franciscan Fathers, 1910:1912

1. ?aca (?acaji)* c'iI-eagle (Eagle Way) plant (F): B.S. Lupinus Kingii (5)
2. ?ac'ose- ?aze'?-Plume Way medicine: B.S. Lotus Wrightii (2)
3_ ?ajikQ' halcin-groin odor (F): B.S. Valeriana ovata (3), V. aeutiloba, V. trachycarpa
4. ?alii: be'yi.c'oI:-urine spurter (diuretic): FORM GEN. Hieracium Fendleri (3), Wulfenia plantaginea (2), Agoseris purpurea, Anemopsis californica, Linum australe, Plantago major (M and F-Draba montana)
5. ?dtani-c'ehi' c'u's-slender cockle burr: B.S. Glycyrrhiza lepidota (M,F)
6. ?altj-? jik'asi-bow smoother: B.S. Equisctum kansanum (7), E. laevigatum (2) (F-Juncu-mist.)
7. - - - ?a-k'o'sigi-slender: B.S. Equisetum arvense
8. ?ana-tco-i-yellow eyes: B. S. Solanum elaeagnifolium (10) (F)
9. ?at'~.? coh-big leaves (F): B.S. Pericome caudata (3)
10. ?at'w? c'o-s.~slender leaves (F): B.S. Hedeoma nana (5)
11. ?awe'? bi la-i yilbe-z-placcnta boiler (F): B.S. Penstemon coloradoensis (29), B.S. Chrysothamnus depressus (31)
12. - - - ?a-Jc'ozigi-slender, or ba?a-di-female: (for Penstemon coloradoensis)
13. - - - nca.gi'-large, or bika?i-male: (for Chrysothamnus depressus)

A good example of two basic species of equal standing. 12 and 13, although individual names, may be used to distinguish them.

14. ?awe- c'a'l-baby mat (see 100): B.S. Cowania Stansburiana (4) (M, F), B.S. Purshia tridentata (3)
15. ?aya?ai-standing erect (F): B.S. Artemisia dracunculoides (3)
16. _ _ _ coh-big: B.S. A. dracuneuloides (large specimens) (15) or A. campestris (2)
17. _ _ _ tbilhigi-gray: B.S. Artemisia kansana (13), A. scopulorum
18. ?ayani bicil-bison plant: B.S. Lepachys tagetes (2),1,. columnaris, val. pulcherrima, Helianthus ciliaris
19. ?ayani biliz ha-lcin --odor of bison urine (F), or -?azliigi: B.S. Psoralea lanceolata (5)
20. ?azc-? bi.jici.-red core medicine (F): B.S. Astragalus loncho-carpus(6)
21. ?aze. (en) bihitah do'i:izigi-blue flowers: FORM GEN;. Cilia multiflora, Gilia rigidula, val' acerosa, Parosela scoparia (2), Penstemon coloradoensis, P. oliganthus, Sidalcea neomexkaml. Verbena bracteata (3)
22. ?aze-? (eil) bilatah ha.lcoi (hco'igi)-yellow flowers: FORM GEN. Actinea argentea, Agooseris purpurea, Aploppapus g-radlis, Brassica arvensis, Chrysopsis villosa, val'. canescens, Draba Helleriana, Dyssodia acerosa, Lepachys columnaris, var. pulcherrima, L. tageles, Melilotus indica, Psilostrophc tagetina, Senecio Fendleri, S. filifolius, S. quaerens, Solidago trinervata, Taraxacum montanum, Zinnia grandiflora
23. ?aze'? (eil) bilatah halgai (liga'igi)-white flowers: FORM GEN. Gilia longiflora (2), G, pinnatifida, Lepidium montanum, Melampodium leucanthum (2), Oenothera albicaulis, Townwnsendia Fendleri (2)
24. ?aze'? bilatah lici'?igi-red flowers: FORM GEN. Gaura roccinea, Gilia Greeneana, Verbena ambrosiaefolia
25. ?aze'? bit'a? do.l asi --serrate leaves: FORM GEN. Hoffman-seggia densiflora, Potentilla Anserina, P. pennsylvanica, Sonchus asper, Tribulus terrestris
26. ?aze? bit'a? nt'e.li-broad leaves: FORM GEN. Berlandiera lyrata, Limonium limbatum, Plantago major, Verbascum Thapsus, Wulfenia plantaginea
27. ?aze'? coh-big medicine: B.S. Asclepias tuberosa (2), A. speciosa (F_Erysimum asperum)
28. ?aze'? (c'iI) c'o.s (?a-lc' o-sigi)-slender medicine: FORM GEN. Asclepias galioides, Hybanthus verticillata, Melampodium leucanthum, Polygala alba, Potentilla monspeliensis, Pseudotsuga mucronata, Sisymbrium linearifolium, Trifolium subacaulescens (F-Vesicaria alpina, Aploppappus lanuginosus)

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26. Matthews, 1886; Franciscan Fathers, 1910; 1912.

*j represents approximately the sound that it does in English "judge." Because of an incomplete font it is used instead of the usual symbol.

29. ?aze'? dit'i?i--viscid medicine (F): FORM GEN. Mentzelia sp., Oenothera caespitosa, var. marginata, Sphaeralcea Fendleri
30. ?aze'? do is-blue medicine: B.S. Ditaxis cyanophylla (2): FORM GEN. Helianthella Parryi, Lathyrus eucosmus, Parietaria pennsylvanica, Potentilla propinqua (F-Nasturtium obtusum)
31. ?aze'? hajini'-black root medicine, or---c'os-slender: B.S. Lithospermum angustifolium (15) (M,F)
32. - - - coh-big: B.S. Lithospermum multiflorum (10) (M)
33. - - - laba?i-gray: B.S. Cryptantha fulvocanescens (5), C. Jamesii, var. multicaulis (5) (F-Lithospermum multiflorum-conf.)
34. ?aze'? hak'izi-twisted medicine: B.S, Eriogonum Jamesii (10) (F-E, microthecum)
35. ?aze'? ha-1_3id-rotten medicine: Eriogonum Jamesii, Potentilla pennsylvanica (F-Hymenopappus filifolius)
Since the roots of these plants arc similar in appearance it is impossible to tell which is the basic species.
36. - - - coh-big: Helianthella Parryi
37. ?aze'? hukani.--rounded medicine: B.S. Cirsium calcareum (8), C. undulatum (12), C. ochl'ocentrum (F), C. pulchcellum, (F- Potcntilla gracilis-mist.)
The various species of Cirsium are not distinguished by the Navajo.
38. ?aze? (c'il) h"'osi-spiny medicine: B.S. Salsola Kali, var. tragus (3): FORM GEN. Ribes pinetorum (2), Astragoalus Kentlophyta, Aplopappus spinulosus, Solanum triflotum (F-Bigelovia Vaseyi)
39. ?aze? i.l "o?i-runs into the mouth: B,S. Polypogon monspeliensis (2), Sitanion hystrix (M and F-Hordeum jubatum)
40. ?aze' (c'iI) labahi (laba?igi)-gray medicine: FORM GEN. Amaranthus graecizans, var. puhescens, Antennaria apreca, Astragalus Kentrophyta, A. sonorae, Bahia absinthifolia, var. dealbata (3), Baileya multi radiata, Ber1andiera lymta, Chrysopsis villosa (3), Cladothryx lanug-inosa, Corispermum hyssopifolium Erigeron divergens, Eriogonurn racemosum, Erysimum asperum, Evolvulus pilosus, Franscria discolor, Gail1ardia pinnatifida (2), Galium Fendlel'i (2), Gaura cocdnea, Gilia multiflora, Hieracium Fendleri, Lotus Wrightii, Lupinus Kingii, Melampodium leueanthum, Oenothera caespitosa, var. marginata, Plantago argyrea, Potentilla Anscrina, P. norvegica, var. hirsuta, Senecio Hartianus (2), S. Riddellii, Silene laciniata. Sisymbrium linearifolium, Whipplea utahensis (F -Arabis communis-no species bearing this name has ever been described)
The form genus “gray medicine” includes many species having brownish or yellowish flowers or gray or silvery leaves.
41. ?aze'? lahdilt'ei-scattered or solitary medicine: B.S. Erysimum asperum (4) (M and F-Arabis Holboelii)
42. ?aze'? lici.?!gi-red medicine: B.S. Lithospermum angustifolium (11)
The basic species of 31 and 42 are the same botanical species, being distinguished according to informants by the color of the roots. Two collections which were indistinguishable to a trained botanist were consistently named by three independent infomants, although the criteria were not apparent to the botanist.
43. ?aze.? licoi-yellow medicine: FORM GEN. Actinea leptoclada, var. Ivesiana. Apocynum sibiricum, var. salignum, Astragalus tenellus, Lygodesmia juncea. (F-Oenothera grandiflora)
44. ?aze'? liga'igi-white medicine (F): FORM GEN. Abronia Bige1ovii (2), Amsonia hirtella. Asclepiodora decumbens, Hoffman-seggia Jamesii, Oenothera Hooked, Oxybaphus linearis (2), Silene laciniata, Stellaria Jamesiana
45. ?aze'? na'ne'sdizi-winding medicine: FORM GEN. Arabis perennans. Astragalus Hosackiae, Astragalus tenel1us (2), Cerastium longipedunculatum, Chara sp., Lathyrus graminifolius. Mirabilis oxybaphoides, var. glabrata, Oenothera coronopifolia, Oxybaphus lineaTis, Panicum obtusum (2). Polygonum aviculare, P. Douglasii, Parosela lanata, Ptiloria neomexicana, Sedum Wrightii, Vicia americana (F-Hosackia Wrightii, -slender-Lithospermum canescens)
This form genus includes plants of prostrate, spreading habit.
46. ?aze'? na?olta'di'-unraveling medicine: B.S. Townsendia exscapa (4), T. arizonica. T. Fendleri (F-T. sedca)
47. ?aze'? ncj'?i--irritating medicine: B.S. Verbena Wrightii (F-V. Aubletia, Dracocephalum parviflorum), B.S. Phacelia crenulata, var. ambigua (M-P. glandulosa)
48. ?aze'? ndo.te.zi-knotted medicine: B.S. Monarda pectinata (18), M. punctata. subsp. occidentalis (M-M. fistulosa, F-M. punctata), B.S. 2 Mentha arvensis, var. glabrata (3)
49. ---coh-big: B.S. Monarda mollis, var. menthaefolia (2)

50. ---laba.?igi-gray: B.S. Marrubium vulgare (6)
51. ?aze'? no'do,zigi-striped medicine: B.S. Parosela lanata (3)
52. ?aze.? nomazi-globular medicine: B.S. Peteria scoparia (3)
53. ?aze'? nini-sticky medicine: B.S. Sphaeralcea coccinea, var. elata (3) (M.F). S. digitata (4), S. Fendleri (5) (M), S. marginata (4)

The first two species may be called "small" or "slender" and the last two "large," depending on the size of individual specimens.

54. ?aze.? ni izi-hard medicine (also called c'il bicin n 'izi-hard stem plant, ?aze'? cin-stick medicine): B.S. Hoffmanseggia Jamesii (3): FORM GEN. Eriogonum cernuum, E. Jamesii, E. microthecum, Gaura coccinca, var. glabrata. Melampodium leucanthum
55. ?aze-? sak'az-cold medicine: B.S. Gaura parviflora (4) (M, F)
56. ?aze'? ta?i'cohi'-squash blossom medicine: FORM GEN. Astragalus sonorae, Baileya multi radiata, Draba Helleriana, Oenothera Hartwegii. O. Hookeri, Sisymbrium altissimum, Stanleya pinnatifida
57. ?aze'? i.'ohi-grass medicine: B.S. Arenaria Fendleri (M and F-A. aculeata)

b

58. bicin lici'-red stem: B.S. Berberis Fendleri (M included B. Fremontii and B. repens under "yellow stem")
59. bi'hi-lja'?-deer's ears: B.S. Frascra venosa (4) (M and F-F. speciosa), B.S. Wulfenia plantaginea (2), B.S. 2 Plantago major
60. bikeci'n dio?i-woolly rootstock: B.S. Actinea leptoclada, var. Ivesiana, Hymenopappus gloriosus
61. bilha.zef'n-wind odor: B.S. Brickellia grandiflora, var. petiolatis (7), B. californica, B. gmndiflora. B.S. Eupatorium herbaceum (5) (M and F--E. occidentalis)
62. bis ndo.ci'?_red on adobe: B.S. Eriogonum fascicuJatum (M. F), E. polycladon (2), E. Wrightii
63. - - - ?a'lc'ozigi-slender: B.S. Eriogonum Wrightii (M-E. microthecum)
64. bit'a?as a?-five leaves: Parthenocissus vitacea (3) (M), Rubus parviflorus, var. parvifolius (F-plant akin to stone parsley). This may be a form genus.
65. bi'yadi !ici'-red beneath (-haW.): B.S. Penstemon trichander (8)
66. - - - ?a.lc'ozigi-slender: B.S. Penstemon neomexicanus (5)
67. ca?aszi-standing awl (botanical name for Yucca): B.S. Yucca baccata (3) (M and F-G)
68. - - - c'o,z-slender: B.S. Yucca glauca (5) (M, F)
69. ca a?nlc I nca.gi-large breeze through rock: Dyssodia papposa (M-Pectis angustifolia)
70. ce coh k'i'?-big rock sumac: B. S. Philadelphus microphyllus (4) (F)
71. cedide.h-rock tea, or - - - coh.-big: B.S. Mirabilis multiflora (9) (F-G)
72. - - - c'o's-slender: Mirabilis oxybaphoides (2), Oxybaphus melanotrichus, Oxybaphus nyctagineus, var. pilosus, Selinocarpus diffuses This variety is apparently a form group for small members of the N yetaginaeeae.
73. ce?esda-zi'-heavy as stone: B.S. Cercocarpus montanus (6) (M,F)
74. ce?esg1zi,-twisted into stone: B.S. Amelanchier Bakeri (F-A. alnifolia)
75. ce?ezi'h-rock sage: B.S. Artemisia Wrightii (23), A. a1bu1a (F- A. tridentata---conf. or genl.)
76. ce gad-rock juniper: Selaginella mutica
77. cek'i.n?alcizi.-scrapes on rock: B.S. Clematis]igusticifolia, B.S. Pericome caudata (2) (F_Gratiola virginiana)
78. ceni cil---cliff plant: Pellaea Suksdorfiana
79. ceni?ji-rock center: B.S. Adiantum Capillus-Venerlis (2)
80. ceoya hata.t-sings under rock: Radicula hispida, Stan1eya pinnatifida (F-Brassica campestris)
This is probably a form uen1l~ for crucifers.
81. ci--aji c'iI-hair plant, or ci'-yajilci-red hair: B.S. Portulaca oleracea (6) (F_Cuscuta umbellata)
82. cisn'ada?-bee's food: B.S. Cordylanthus Wrightii (2), B.S. Orthocarpus purpureo-albus
83. ci 'iz-hard wood: B.S. Fendlera rupicola (M, F)
84. cioyah Mcion--{Jdorous under trees: B.S. Chenopodium Botrys (5)
85. c'ah-sage (botanical name): B.S. Artemisia Bigelovii (3), A. tridentata (5) (F)
86. c'ahbj'h-deer sage(?): Stanleya pinnaWida, Sisymbrium linearifolium (F-a crucifer Physaria)
This is apparently a genus of crucifers.

87. c'os be'yi'c'ol-vein spurter: FORM GEN. Astragalus sonorae, Cheilanthes Feei, Erigeron divergens, E. flagellaris, Gayophytum Nuttallii (2), Linum aristatum, L. puberulum, Potentilla monspeliensis, Tragia ramosa
This is either a form genus or family including plants with slender stems and leaves, which are used for hemostatics (dilside ?aze'?-hemorrhage medicine).
88. cahas de,zi.-strung along: B.S. Phellopterus bulhosus (2) (F-Cymopterus montanus)
89. cec'il--{Jak: B.S. Quercus utahensis (4), Q. spp. (3) (F-Q. undulata-genl., M-Q. undulata, var. gambelii)
90. - - - M.'izi-hard: B.S. Quercus undulata (4) (M and F-var. pungens)
In. cec'il ?I lt'a?i-resembling: B.S. Berberis repens (6)
92. cil cin-sumac (also called k'j'?): B.S. Rhus canadensis, var. trilobata (7) (M,F)
93. --- di' ogi-hairy: Schmaltzia Bakeri
94. ci-lcin ?i.lt'a.'?i-resembling sumac (F): B.S. Geranium atropurpureum (4). G.lentum (3), G. Fremontii (2), G. iurcatum
95. co' in ?aze'?---arthritis medicine: B.S. Corydalis aurea (5):FORM GEN. Artemisia Absinthum (or A. franserioides), Artemisia scopulorum (2), Asclepias tuberosa, Bahia dissecta (3), Brickellia brachyphylla, Chrysopsis villosa, Descurainia obtusa, Franseria acanthicarpa, Gilia longiflora, Hymenopappus robustus, Sidalcea neomexicana, Solanum triflorum, Stanleyella Wrightii, Verbena ambrosiaefolia
This may not be a true form genus since its name is a family name which has become a specific name through usage. The species other than Corydalis aurea may have been included because of their family affiliations.
96. c'al da?-frog food: B.S. Ranunculus micropetalus, Berula erecta (M and F-Salvia lanceolata)
97. - - - ?a'k'ozigi-slender: B.S. Salvia reflexa
This is more or less of a form genus for plants growing in or otherwise associated with water.
98. c'a o-l-pinyon: B.S. Pinus edulis (F)
99. c'a?ol bidac'a-?-pinyon basket: Arceuthobium cyanocarpum (4)
100. c'asc'il-name for small or short specimens of 14 B.S.
101. ci-?da.?-bitter food: B.S. Ceanothus Fendleri (6) (F-G), B.S. 2 Cercocarpus breviflorus (2)
102. c'il ?abe?-milk plant, or - - - c'o's--slender: B.S. Euphorbia Fend1eri (14), E. novomexicana (2), E. serpyllifolia (6) (F and M-G. F-Commandra pallida); B.S. 2 Asclepias galioides, A. macrotis
103. - - - coh-big, or nca.gi'-large: B.S. Asclepias involucrate (3), A. tuberosa, Asclepiodora decumbens (5), B.S. Lactuca pulchella (2), L. scariola, var. integrata
This genus includes plants having a milky juice.
104. c'il :>ahwosi (dohwosi)-spiny plant: B.S. Franseria acanthicarpa (4). F. tenuifolia (F-Bidens, Bigelovia Vaseyi)
105. c'il be'c'os holo'nigi-~having feathers: FORM GEN. Agoseris purpurea, Asclepias galioides, Epilobium paniculatum (M-E. coloratum)
This may be a form genus or Epilobium may be the B.S.
106. c'il behe .'o.l timigi-p]ant with many roots: B.S. Penstemon coloradoensi~. P. neomexicanus, P. strictus, P. trichander (2). P. sp.
This group has some of the characteristics of a form genus, since other species, e.g. Plantago spp., may be included.
107. c'i] beher-'o'l tico-igi-plant with yellow root: B.S. Rumex crispus (3), R. mexicanus, B.S. Cordylanthus Wrightii (3) (F-a gentian)
108. c'il be,zn e.si-plastering plant: B.S. Corispermum hyssopifolium (2) (F-Chenopodium)
109. c'i] bit'a? ?a'lc'ozigi-slender leaves: FORM GEN. Alsine Jamesiana, Cerastium longipedunculatum, Erigeron nematophyllus, Lathyrus graminifo]ius, Sisymbrium altissimum, S.]inearifolium (2), Viguiera multiflora
110. c'il de-nini-sharp plant: B.S. Salsola Kali (F-var. tragus)
111. c'il dici' igi-peppery plant: FORM GEN. Gaura parviflora, Lupinus ingratus, Penstemon sp., Sophora sericea
112. c'il dije-higi-gummy plant: FORM GEN. Agoseris purpurea, Grindelia aphanactis (2), Nama hispidum, var. spathalatum, Radicu]a hispida, Senecio Hartianus, Taraxacum palustre, var. vulgare (2), Zinnia grandiflora
113. c'i] dihesi'-dodge weed, or - - - yazi-little: B.S. Gutierrezia Sarothrae (27) (M,F), G. diversifo]ia, G. sp. (3)

114. - - - coh-big: B.S. Gutierrezia tenuis (11)
115. c'il disohi-furry plant, or disohgi c'il: FORM GEN. Lupinus Kingii, Marrubium vulgare, Psilostrophe tagetina, Penstemon Whippleanus
116. c'i] hoci-itch plant: B.S. Dithyraea Wislizeni (5)
117. c'i-ljo.?-flexible plant: B.S. Artemisia fi]ifolia (3) (M-Sporobolus cuspidatus, F---Actinella Richardsonii-genl.)
118. c'il kohwe? plant coffee: B.S. Thelesperma gracile (3), T. subnudum (F-Heuchera bracteata-mist.)
119. c'il latah ?ac'os-feather top: B.S. Sieversia paradoxa (3) (F-Epilobium coloratum)
120. C'iI na?ar-'o'?i.-weaving plant, or - - - neit'gi'-large: B.S. Humulus Lupu]us, var. neomcxicanus (2) (:\1 and F-Ampelopsis quinquefolia, F-C]ematis ligusticifolia, Prunus domestica, Vitisvinifera)
This may be a form name for plants of vine-like habit.
121. _ - c'o's-slender: B.S. Clematis]igustieifolia (15)
122. c'i'ndi c'iI-ghost plant: B.S. Tetradymia canescens, var. inermis (1:3) (F-Bigelovia graveolens - conf. or mist.)
123. c'i's ?aze?-running nose medicine: B.S. Aplopappus Nuttallii, A. spinulosus, B.S. Aster ericaefolius (2) (M-Physaria Newberryi)
124. c'o-spruce: B.S. Pseudotsuga mucronata (4) (F-Picea)
125. - - - de-nini-sharp (F): B.S. Juniperus sibirica (5), B.S. (2) (?) Picea pungens (3)
126. - - - nt'e'li-broad (F): B.S. Picea pungens (2)
127. c'o ntci'n-odor of: B.S. Pscudocymopterus montanus (4) (F-Phloxcacspitosa)
128. c'oxojile'i-madness producing: B.S. Datura meteloidcs (4) (F-D. stramonium)
129. c'oh-rose: B.S. Rosa Fendleri (2) (F), R. neomexicana (5)

d

130. da?a-ya.li, coh-big rattles: Astragalus Pattersonii
131. - - - c'o.s-slender: B.S. Astragalus al1ochrous (2) (F G)
132. dabba?-gray up above: B.S. Fraxinus cuspidata
133. dahi-tihida'?-humming bird's food: B.S. Penstemon trichander (8), Castilleja integra (21), C. Jineata (2), C. sp. (2) (M-C. affinis, Silenc lacincata-conf.) B.S. 2 Gilia Greeneana (4) (F G. aggregata)
This genus has at least three basic species, Costillejo spp. are often characterized as "]arge" (F-C. integra) or "gray" (F-C. parviflora) and the PenRtemon and Gilio as "slender" (F-P, barbartus, var. Torreyi).
134. de-lda'? or del ja-d-sandhill crane's food or legs: B.S. Rumex crispus (6), R. mexicanus (8)
135. dibecetah c'il-bighorn plant: Erigeron divergens (2), Brickellia grandiflora (F-Epilobium spicatum)
136, dibe haic'i'di-sheep scratch, or - - - laba igi-gray: B.S. Astragalus Matthewsii (8) (M-Sophora sericea, Astragalus sp., F-an Oxytropis)
137. - - - a'1c'uzigi- slender: B.S. Astragalus scaposus (2)
These names may be used in a general way for other species of Astrgalus.
138. dibe nat'oh-sheep tobacco: Pcnstemon neomexicanus, Aster oblongifolius, Salvia 1anceacfoEa (F-an Oxytropis) This may be a form genus.
139. di_3e-berry': B.S. Prunus melanocarpa (6) (F-P. virginiana)
140. - - - ?a'lc'ozigi-slender: B.S. (?) Forestiera neomexicana (2)
141. - - - coh--big (peach) (F)
142. - - - dit'odi-soft: B.S. Amelanchier alnifo1ia, var. pumila (3), A. alnifolia (M, F-G)
143. - - - dokozi-bitter: B.S. Ribes pinetorum (3), Ribes aureum (F-Prunus armeniaca-genl.)
144. dixidi.?ai-put in a fire (F): B.S. Oxytenia acerosa (2)
145. dinas c'o.z-slender dinas (F): B.S. Pachystima myrsinitcs (9) B.S. Arctostaphylos Uva-ursi (7), A. pungens
146. dini?e' C'il-Game Way plant: FORM GEN. or FAMILY Draba Helleriana, Fragaria bracteata, Geranium lentum, Gi1ia pinnathida, Lepachys tagetes, Lonicera arizonica, Medicago sativa, Psoralea tenuiftora, var. obtusiloba, Rumex mexicanus, Wulfenia plantaginea, Trifolium subacaulescens (F-Lygodesmia rostrata, Menodora scabra)
147. do-ywozi'_"chamiso," or - - - lba?i-gray: B.S. Atriplex canescens (M-G, F, or Sarcobatus)
148. do-y"ozi' zin-black "greasewood": B.S. Sarcobatus vermiculatus (6) (M-G, F)

149. doko'z-bitter ("salt weed"): B.S. Atriplex argentea (3) (M-G, F), A. confertifolia, A. obovata, A. Nuttallii, A. rosea

150. ---sazl'ni'-standing: A. confertifolia, A. argentea (F A. expansa)

The Navajo do not clearly distinguish the different species of Atriplex. A. argentea is probably the basic "salt weed."

y

151. *y*o bina izi-prairie dog's squash, or *y*o-da?-food: B.S. Solanum triflorum (2)

3

152. $_3$il mit'oh-mountain tobacco: B.S. Nicotiana attenuata (9) (F)

g

153. gad-juniper: B.S. Juniperus pachyphloea (2) (M-J. communis, F--J. occidentalis)

This name is applied to the common juniper in any given region, often to J. monosperma.

154. --- cagi-fringed (See 156)

155. ---nezi.-tall: B.S. Pinus flexilis (6), P. chihuahuana (3)

156. ---ni?e.li.-floating (also called gad cagi' or dilk'isci'?-red popping in fire): B.S. Juniperus scopulorum (2) (M and F--J. virginiana, F--J. communis) B.S. 2 J. monosperma (5), J. occidentalis

157. gad bidac'a.?-juniper basket: B.S. Phoradendron juniperinum (5) (M,F)

158. ga..gi bii.'ohcin--crow's onion (See 291) (F-Allium cernuum)

159. gahbilak'ani-liked by cotton tail rabbit: B.S. Artemisia tridentata (3)

160. gahcohda'?-jack rabbit's food: B.S. Eurotia lanata (6) (M,F)

161. ")'wo'dini' ?aze.?-toothache medicine: B.S. Penstemon coloradoensis, P. neomexicanus, P. trichander

This may be a family name.

h

162. hayani.yo.di' (ha-ya?azi')-cathartic (F): FORM GEN. Penstemon strictus, P. sp., Artemisia scopuJorum (2), Franseria discolor, Gilia aggregata

163. hasbidida'?-dove food: B.S. Corydalis aurea (3) (F-var.occidentalis)

164. hastoi ci-*ye*'r--old man's queue: Clematis alpina, Lepachys columnaris, Var. pulcherrima, Plantago argyrea (M and F-Petalostemum candidus, var. occidentalis)

This may be a form genus of legumes and similar plants.

165. ha'sce'da?-supernatural's food: B.S. Lycium Torreyi (11), L. pallidum (2) (M, F)

166. ha'se'e.? ?ilci'?igf--supernatural's hair: B.S. Houstonia rubra (2) (F-Vesicaria Fendleri)

167. haza?ale' laid in mouth: B.S. Aulospermum purpureum (4) (F-Cymopterus glomeratus)

168. - - - coh-big: B.S. Pseudocymopterus montanus (2) (M Cymopterus purpureus, F-Ferula muitifida)

169. hazahosi'?i-astringent (zahosxi.?): B.S. SanvitaJia Aberti (2) (F-akin to stone parsley)

170. haze'ilce'?e-like a squirrel's tail: B.S. Achillea lanulosa (6) (M and F-A. Millefolium)

171. haze'ilt'~'?i-resembling a squirrel: B.S. AquiJegia elegantula (3), A. formosa (F-a grass)

172. ho.gisi'---cutting leaves (F): B.S. Nolina microcarpa (2)

173. hosc'i'hi ?a-lc'ozigi-slender stinging: B.S. Urtica viridis (F-Epiiobium origanifolium_genl.)

17.1,. - - - ncii'gj'-]arge: B.S. Urtica gracilis (2) (F-Oenothera speonf.)

175. h^{w}os be'l?dehi'-cactus brush: B.S. Senecio filifolius, Senecio Riddellii (2) (M and F -So Douglassii)

176. h"os---cactus-Opuntia sp. (3)

The Franciscan Fathers listed fifteen Navajo varieties of cactus and gave six identifications, four species of Opuntia and two of Cereus. Our list is not complete.

177. - - - decahi coh-big thorny: B.S. Opuntia arborescens (4) (F)

178. - - - lba?i-gray-Opuntia sp. (4)

179. - - - nt'e'li-.wide: Opuntia phaeacantha (M and F-O. missouriensis)

i

180. ?i.je'hi--gummy: B.S. Cryptantha Fendleri (4) B.S. 2 Lappula Redowskii, var. occidentalis (F_Echinospermum Redowskii)

181. ?i-l*y*.'ihi.-tenacious: B.S. Mentzelia multiflora (4) (M, F)

182. --- coh-big, or nca gi.-]arge: B.S. Mentzelia pumila, var. multiflora (3) (F called this "slender"), 181 B.S. large specimen (3)

183. 'i'lyizin c'il-witchcraft plant: FORM GEN. or FAMILY Penstemon neomexicanus (2), P. strictus (2), P. trichander (2), Wulfenia plantaginca (4), CJematis alpina (2), Physaria Newberryi (3), Coreupsis cardaminefolia, Sisymbrium linearifolium, Gaura coccinea, Gilia longiflora (M and F-Gentiana affinis)
These plants are used for diseases supposed to be caused by witchcraft. Various Penstemons, Wulfenia, and possibly the Physaria and Clematis may be fairly definite basic species.

184. ja-?abanida.'?-bat food (see 187): B.S. Cheilanthes Feei, Cystopteris fragilis (2), Pteridium aquilinum, var. pubescens (2)
This name is applied to various ferns.

185. ja-?abani ?i.lt'a?i-resembling a bat: B.S. Pericome caudata (2) B.S. 2 Bricke1lia grandiflora

186. jadi'lde'?-antelope's horn: (M and F-Asclepiodora decumbens)

187. ja'nlcili'da?-bat food (see 184): B.S. Cheilanthes Feei (3) (F)

188 je'? do'*y*.is-blue gum: B.S. Ptiloria neomexicana (2)

189. jihibilira.li-chewing gum: B.S. Eriogonum Jamesii (2)

190. jilxazi-biting weed (?): B.S. Celtis reticulata (F-G)

k

191. keci-n ha-lci-red base: Polygonum aviculare (M and F Euphorbia Pringlei)

192. ?aze-?bikeci-n ha-Ici'?igi-medicine with a red base: Lotus Wrightii, Penstemon neomexicanus (F-Oenothera tenaectifolia)
This may be a form genus.

193. keci-n ha'!coi-yellow base: B.S. Orthocarpus purpureo-albus (5) B.S. 2 Cordylanthus Wrightii

194. ki-lcini' coh-big child: B.S, Tradescantia occidentalis (2), T. scopulorum (F_Zygadenus venenosus)

19.5. _ _ _ J:ci'-red: Calochortus Gunnisonii (M and F caned C. Nuttallii "children's food")

196. k.lcini' ?j.lt':j..?i-.resembling child: B.S. Commelina dianthifolia (2), C.linearis

197. ko? ?aze.?-fire medicine: B.S. Mirabilis oxybaphoides (5):
FAMILY Oxybaphus linearis, O. nyctagineus, var. pilosus, O. melanotrichus

k’

198. k'a'?be's ?i-lt'a'?i-resembling an arrowhead, or bit'a? k'a?be-s arrowhead leaves: FORM GEN. Brickellia grandiflora, Var. petiolaris (2), Convolvulus arvensis (2), Pericome caudata

199. k'ai?-willow: B.S. SaJix Wrightii (3), S. fluviatilis (F-G)

200. --- Ibahigi_gray, or _ _ _ do'*y* is-blue: B.S. Salix Wrightii (4), S. amgdaloides (2) (F-S. Babylonica)
The willows were not consistently distinguished by informants.

201. k'asdabe-gq.-arrow killer: HeIianthel1a Parryi (2), Hymeno-pappus gloriosus, Helianthoid Compo (M and F-Eupatorium purpureum)

202. - - - laba?igi-gray: B.S. Hymenopappus gloriosus (2), H. mexicanus

203. - - - nca-gi'-large: Arnica foliosa, HeJianthella Parryi, Rudbeckia laciniata
This seems to be a form group including chiefly helianthoid compositae.

204. k'e*y* ahi'-spread under foot; B.S. Polygonum Douglasii, P. ramosissimum (F -Delphinium scaposum or bicolor)

205. k'I lcoi dijo-li-round yellow stem: B.S. Bigelovia graveolens (11) (M,F)

206. k'j-?-(see 92)

207. k'h'ljipa'hi-skinned from the tree: B.S. Ribes inebrians (11), R. pinetorum (2) (F -Purshia tridentata-mist.)

208. k'j?nH,iiii'd4'?-beetle food; B.8. Abronia cycloptera (2), A. fragrans (3) (M, F)

209. k'isisjij z-smashed down Sumac: B.S. Rhus Toxicodendron (F, F-Urtica sp.)
This may be a form group for plants which irritate the skin.

210. k'ioiini'_black sumac (see 218)

211. 1ok'a-?-arrow reed: B.S. Phragmites communis (5) (M, F)

212. - - - coh-big- (F): B.S. Arundo donax

213. le'?aze'?--earth medicine: B.S. Eriogonum alatum (22) (M, F-G)
214. le?aze.? ?i-lt'a?i-rescmbling earth medicine: B.S. Eriogonum Jachnogynum (7)
215. le'do'le'z-foot in the ground: B.S. Orobanche fasciculata (4) (M. F), ConophoJis mexicana (2)
This is a name for the Orobanchnaceae in general, derived from the shape of the stem.
216. le'?ecoh "j.)ja'?-rescmbling a rat's ear: B.S. Hieracium Fendleri (2), Physaria Newbenyi (2) (F_Ranunculus cymbalaria)
Although two basic species arc listed the name seems to be used rather loosely.
217. Ij' da-horse food: B.S. Lupinus ingratus (7) (F-Sidalcea malvaeflora)

m

218. ma?i'da ? coyote food (see 210): B.S. Forestiera neomexicana (4) (M, F, F-Prunus demissa)
219. ma?i. lizeoyote urine: B.S. Senecio filifolius, S. Hartianus
220. ma?i. na?o ljil-whirling coyote: FORM GEN. Ribcs inebrians. Shene sp., Senecio Hartianus, Sisymbrium linearifolium, Solanum rosttatum (M-Astragalus kent Topbyta, F -Oxytropis sp.)
221. ma?i yiste.? coyote bed: B.S. Antennaria aptica (2) (F Sarcobatus--mist. or genl.)

n

222. mi?adi'?-blind (no eyes): Astraells hyglometricus (2)
This is a general name for members of the Lycopcrdoceoe since it is believed that the spores cause blindness.
223. na?asje"i c'il-spider plant: FORM GEN. Androsacae septentrionalis, Var. puberulenta, Arenaria Fendleri, Astragalus Hosackiae, Hoffmanseggia drepanocarpa, Linum puberulum, Polygonum aviculare, Potentilla pennsylvanica, P. propinqua
224. na?asje?i da'?-spider food: FORM GEN. Androsacae septentrionalis, Var. puberulcnta, var. glandulosa, Boerhaavia sp., Bouteloua eriopoda, Cladothryx lanuginosa, Galium Fendleri, Gaura coccinea, Hoffmanseggia drepanocarpa, Petalostemum oligophyllum (F-Vesicaria Fendleri, Croton texensis)
The last two groups include plants with a "spidery'" habit. Androsacae spp. may be basic.
225. na?asje?i *y*'ol-spider rope: B.S. Erigeron flagellatis (2), E. divergens
226. na?aso?i da?-lizard food: B.S. Asclepias galioides (2)
227. na?aso?i do'a'iz-blue lizard: Allenrolfea occidentalis
228. na?as.;.?i ?i'lce'?_resembIing a lizard's tail: B.S. Asclepias involucrata(2)
229. na?as.;.?i ?i-Ide?-resembling lizard's horn: B.S. Asclepiodora decumbens (2) (F)
230. mibi'h-deer eye (F): B.S. Conioselinum scopulorum (5)
231. nada? ?i-lta.?i-resembling corn: B.S. Smilacina amplexicaulis (2)
232. naho.yai-tuber: unidentified tuherous root (F-Convolvulus)
233. nak'i'hinaka.di' (nixi-hi'dinaka-d)-limbs on the ground: B.S. Juniperus sibirica (5)
234. na?oli ?i lt a?i (nano'l?li)-resembling beans: B.S. Lathyrus eucosmus (M and F-L. polymorphus), Astragalus ealycosus, Lotus Wrightii, Oxytropis Lambertii
This may be a form genus to include various Leguminosae, with Lathyrus leading.
235. nit'oh coh-big-tobacco: B.S. Verbascum Thapsus (4)
236. na'zka-di'-spread out: B.S. Amaranthus blitoides (2) (M, F), A. graecizans, A. retroflexus
237. ilc'a'? ?i'ln~basket maker: B.S. Parryella filifolia (4) B.S. 2 (?) Parosela formosa
238. ildelldi-scorched: B.S. Oryzopsis hymenoides (M, F)
239. ildf' ili'-sunflower (F), or - - - coh-big: B.S. Liclianthus annuus (8) (F-Gymnolomia multiflora)
240. - - - c'o's-slender: B.S. Helianthus annum; (small specimen), Rudbeckia flava (F-Gymnolomia multiflora)
241. ildi *y*linlcini--odorous sunflower: B.S. Verbesina encelioides, var. exauriculata (M, F-Helianthus Nuttallii-mist.)
242. ndilkal-wild gourd (F): B.S. Cucurbita ioetidissima (2)
243. ndisci'?-pine: B.S. Pinus ponderosa (F-P. flexilis)
244. ndo'ci'-red downwards (F): B.S. Corallonhiza multiflora (2), Pterospora andromedea
245. ne?ecah ?aze'?-pimple medicine (F): B.S. Erigeron canadensis (8) B.S. 2 Asclepias galioides (3)
246. ne"esja'?i'lk'e-?--owl's feet: B.S. Actinea Richardsonii (5) (F-Helenium Hoopsiieonf.?)
247. niha-,*y*andi-earth house: B.S. Eriogonum racemosum (4) (M, F)

248. niha *y*a'd - earth moss, or ce*y*a'd-rock moss (F): B.S. Parmelia molliuscula (6), Peltigera sp. (5)
249. ni-?icq-sieath veins (F): B.S. Petalostemum oligophyllum (4)
250. - - - coh-big (F): B.S. Petalostemum oligophyllum (6), Astragalus allochrous (2), A. lonchocarpus (3), A. sonorae, A. tenellus.

Some informants use this name for 249 B.S., but it is also applied to slender, glabrous species of Astragalus.

251. - - - c'o's-slender: Astragalus pictus (2), Lathyrus graminiiolius, Lotus Wrightii, Sophora sericea

This seems to be a form species including several slender legumes resemb1ing Petalostemum.

252. ni?i'n'il-snuff, or --- c'o.s-slender: B.S. Aster ericaefolius (8) B.S. Linum australe, L. aristatum, L. puberulum (2) (F Townsendia strigosa)
253. - - - coh-big: B.S. Baccharis \Vrig-htii (2) B.S. Linum australe (F-Aster canescens, Zinnia grandiflora)
254. nomazi-globular, or nomazi c'o's-slender globular: B.S. Solanum ,Jamesii (10) (M-S. tuberosum, F-Ipomea ponderata)
255. nomazi ?i.lta)I-resembling globular: B.S. Chamaesaracha coronopus (3)

o

256. ?osce? (*y*-'osce)-first one: B.S. Descurainia Sophia (2), Arabis perennans (F_Sisymbrium incisum)
257. --- ?a.lc'ozigi--slender: B.S. Arabis perennans (2)
258. --- coh-big: B.S. Descurainia incisa, D. obtusa (2), D. Sophia
259. ?osce? ?i'lt'I)'?i-resembling first one: B.S. Descurainia incisa, D. Sophia, Lepidium montanum, var.
260. sai be? ezo?--sand broom (F): Muhlenbergia Wrightii (used for hair brushes).
261. sas da.?-bear food: B.S. Berberis Fendleri (2)
262. silacoh-my thumb (F) : FORM GEK. Lotus Wrightii, Rudbeckia laciniata, Urtica gracilis

This is a group of poisonous plants.

263. si nal$_3$idi-afraid of the summer: Maurandia antirrhiniflora

t

264. tididi'n do'*y*'is-blue pollen: B.S. Delphinium Nelsonii (4) (M and F-D. scaposum)
265. _ _ _ nca.gi'-large: Geranium atropurpureum (2), Oxytropis Lambertii (2), Verbena MacDougalii

Individual application of name to plants with blue flowers.

266. tadi'lcosi'-pops on the forehead: B.S. Physalis longifolia (4) (M and F-Astragalus triflorus)
267. talka'be's-water arrowhead: B.S. Pericome caudata (2) (F-Nasturtium) B.S. 2 Brickellia grandiflora
268. talka'? dahi'kal-spreads over water: FORM GEN. Berula erecta, Ranunculus Cymbalaria (2) (F-Nasturtium alpinum)

This and the next are groups of water plants.

269. taly:'a'h co-water spruce: Berula erecta, Chara sp. (F-prob. Lemna)
270. tazi.lci.n-turkey odor: B.S. Thalictrum Fendleri, or var. Wrightii (7) (F-T. Fendieri, Krynitzkia glomerata-mist.)
271. te.l--cat-tail (broad): B.S. Typha latifolia (4) (F)
272. ---lakani-sweet: B.S. Iris missouriensis (6) B.S. 2 (?) Triglochin maritima
273. --- ni'*y*izi-round (F); B.S. Juncus balticus (4), Juncus sp. (3) B.S. 2 Eleocharis palustris (4)
274. t'i.s--cottonwood: B.S. Populus Wislizenii (M-P. Fremontii, F-P. angulata or Fremontii)

This name is applied to the common valley cottonwood in any given situation.

275. - - - ba?i-gray: B.S. Populus tremuloides (2) (F)
276. - - - coh-big (for a large 274 B.S.)
277. - - - co's-slender: B.S. Populus angustifolia (M, F)
278. to'hjihoco-extending into water (F): Heliotropium curassaviom
279. toika'l-carrying water: B.S. Artemisia frigida (13) (M)
280. to?i'si'hi'-water blackens it: B.S. Suaeda depressa (7) (M Sarcobatus, F-Chenopodium leptophyllum): FORM GEN (?) Asparagus officinalis, Allenrolfea occidentalis, Sedum Wrightii, Solanum triflorum

This group includes plants which are somewhat succulent.

281. to1cin-water odor: B.S. Mentha arvensis, var. glabrata (14) (F-VioJet-mist.)
282. - - - coh-big-: Stachys palustris, subsp. pilosa

283. *y*'e-?i'gahi-white at night, or - - - coh-big: B.S. Oenothera caespitosa, var. marginata (6) (F), O. albicaulis (5), O. coronopifolia (4) (F-Mirabilis multifiora-mist., M-O. brevi flora)
284. - - - c'o's-slender: B.S. Oenothera eoronopifoiia, O. Jaciniata
285. *y*.'i-s coh bicil-big snake's plant: B.S. Frasera paniculata, Sonehus asper
286. *y*.'i's ?ilyo.?i-resembling a snake's tooth: B.S. Aplopappus spinulosus (4)
287. *y*'oh ?azi.hi'-rubbing- grass, or - - ~ c'o's-slender: B.S. Ephedra Torreyana (10), E. viridis (F-E. trifurca)
288. *y*'oh cahi'-awl grass (F): Sporobolus airoides
289. *y*'oh coh-big grass (F): Sporobolus giganteus
290. *y*,'oh c'o's--slender grass: B.S. Sporobolus cryptandrus (2) (M, F)
291. *y*'ohcin--onion (see 158): B.S. Allium cernuum, var. neomexicanum (M and F-A. cemuum, A. Palmeri)
292. *y*'oh de'-seed grass: B.S. Chenopodium leptophyllum (3), C. Fremontii (2) (M, F), C. incanum (2)
293.. - - - coh-big, or - - - n:i'lgai-white eyed: B.S. Chenopodium album (10) (M, F)
294. - - - c'o's--slender: B.S. C. leptophyllum (2)
295. - - - h^{w}osi-prickly: B.S. Amal'anthus retrotlexus (4) (M)
296. - - - ny'izi-hard: Monolepis Nuttalliana (F-a pigweed)
297. ci'yah *y*'oh de'-under trees seed grass: B.S. Chenopodium capitatum (M and F-C. cornutum)
298. *y*'oh de.sk'idi-?-ridged grass: B.S. Amal'anthus retrofiexus (10) (F)
299. *y*'oh lici-red grass: B.S. Sorghastrum nutans (3), Andropogon scoparius
300. *y*'oh nastasi-bent grass: B.S. Bouteloua gracilis (5) (M and F.B. hirsuta)
301. *y*'oh :i1lci'n-odorous grass: B.S. Hierochloe odorata (4) (F- Hedeoma Drummondi-indiv.)
302. wa?-bee weed: B.S. Peritoma serrulatum (5) (F-Cleome pungens)
303. wohici ? ~aze? (c'iI)-red ant medicine: FORM GEN. Dyssodia accrosa, D. papposa, Gaura coccinea, val.'. glabra, Viguiera multiflora, Lepachys tagetes (2), Polygonum aviculare
304. wolaci? be.ga-red ant killer (F): B.S. Grindelia aphanactls (12)
305. wolaci? da-red ant food: B.S. Erlogonum cernum (5) (F-G) B.S. 2 Grindelia aphanactis (4): FORM GEN. (1) Androsacae septentrionalis, var. puberulenta (2), var. glandulosa (2), Arenalia Fendleri, Erigeron divergens, Euphorbia novomexicana, Oxybaphus Bodlni, Psilactis asterioides. Various botanical species of a "spidery" habit are often included in this group as generalizations, often being the same as those in the groups of "spider plants" (see 223 and 224).
306. wolaci.?ilbez.-red ant decoction: FORM GEN. or FAMILY Actinea leptoclada, var. Ivesiana, Coreopsis cardaminefoiia, Corispermum hyssopifolium, Dyssodla accrosa, Eriogonum cernuum (2), Menodora scabra, Paronychia Jamcsii, Polygala alba, Silene Pringlei, Tetraciea Coulteri, Thelesperma longipes, T. subnudum

PART II
BOTANICAL LIST

The following list contains all the species (452) mentioned in Parts I and III, arranged according to botanical families. The author (or authors) of each species is also given, but is not repeated elsewhere. Following each specific name are numbers which refer to the numbers of the Navajo names in Part 1. A number by itself indicates that the plant is a basic species for that Navajo name; followed by (2)-a seconda.ry basic species; preceded by F-in a Navajo form genus.

Appended is a list of the botanical genera represented, arranged alphabetically. Each genus is followed by a number which refers to the number of the first species in that genus in the botanical list. This is for the convenience of readers who may not be familiar with the place of the genera in botanical families.

DIVISION THALLOPHYTA
SUB-DIVISION ALGAE
Characeae

1. Chara sp. 269, F 45

SUB-DIVISION FUNGI
Lycoperdaceae

2. Astraeus hygrometrlcus (Pers.) Morgan 222

SUB-DIVISION LICHENS
Parmeliaceae

3. Parmeiia molliuscula Ach. 248
4. Peltigera sp. 248

DIVISION PTERIDOPHYTA
Polypodiaceae

5. Adiantum Capillus-Veneris L. 79
6. Cheilanthes Feei Moore 184, 187, F 87
7. Cystopteris fragilis (L.) Bernh. 184
8. Pellaea Suksdorfiana Butters 78
9. Pteridium aquilinum Kuhn., var. pubescens Underw. 184

Equisetaceae

10. Equisetum arvense L. 7
11. E. kansanum J. H. Schaffn. 6
12. E. laevigatum A. Br. 6

Selaginellaeeae

13. Selaginclla mutica D. C. Eaton 76

DIVISION SPERMATOPHYTA
SUB-DIVISION GYMNOSPERMAE
Pinaceae

14. Juniperus monospermo. (Engelm.) Sarg. 156 (2)
15. J. occidentalis Hook. 156 (2)
16. J. pachyphloea Torr. 153
17. J. scopulorum Sarg. 154, 156
18. J. sibirica Burgsd. 125, 233

HI. J. utahensis (Engelm.) Lemmon 153

20. Pieea pungens Engelm. 125 (2), 126
21. Pinus chihuahuana Engelm. 155
22. P. edulis Engelm. 98
23. P. flexilis James 155

24. P. ponderosa Laws. 243
25. Pseudotsuga mucronata (Raf.) Sudw. 124, F 28

Ephedraceae

26. Ephedra Torreyano Wats. 287
27. E. viridis Coville 287

SUB-DIVISION ANGIOSPERMAE
CLASS MONOCOTYLEDONEAE

Typhaccae
28. Typha latifolia L. 271

Juncaginaceae

29. Trigloehin maritima L. 272 (2)

Gramineae

30. Andropogon scoparius Michx. 299
31. Arundo donax L. 212
32. Bouteloua eriopoda Torr. F 224
33. B. g-racilis (H. B. K.) Lag. 300
34. Hierochloe odorata (L.) Wahl. 301
35. Muhlenbergia Wrightii Vasey 260
36. Oryzopsis hymenoides (Roem. & Schult.) Ricker 238
37. Panicum ohtusum H. B. K. F 45
38. Phragmites communis Trin. 211
39. Polypogon monspeliensis (L.) Desf. 39
40. Sitanion hystrix (Nutt.) J. G. Smith 39
41. Sorghastrum nutans (L.) Nash 299
42. Sporobolus airoides Torr. 288
43. S. cryptandrus (Torr.) Gray 290
44. S. giganteus Nash 289

Cyperaceae

45. Eleoeharis palustris (L.) R. & S. 273 (2)

Commelinaceae

46. Commelina dianthifolia Delile 196
47. C. linearis Benth. 196
48. Tradescantia occidentalis (Britt.) Smyth. 194
49. T. scopulorum Rose 194

Juncaceae

50. Juncus baltieus Willd. 273

Liliaceae

51. Allium eernuum Roth., val'. neomexicanum (Rydb.) Macbr. 158, 291
52. Asparagus offieinalis L. F 280
53. Caloehortus Gunnisonii Wats. 195
5.i. Nolina microcarpa Wats. 172
55. Smilacina ampIexicaulis Nutt. 231
56. Yucca baeeata Torr. 67
57. Y. glauea Nutt. 68 h'idaceae
58. Iris missouriensis Nutt. 272

Orchidaceae

59. Corallorrhiza multiflora Nutt. 244

CLASS DICOTYLEDONEAE

Piperaceae

60. Anemopsis californica (Nutt.) Hook. & Arn. F 4

Salicaceae

61. Populus angustifolia James 277
62. P. tremuloides Michx. 275
63. P. Wislizenii (Wats.) Sarg. 274, 276
64. Salix amygdaloides Anders. 200
65. S. fluviatilis Nutt. 199
66. S. Wrightii Anders. 199, 200

Fagaceae

67. Quercus undulata Torr. 90
68. Q. utahensis (A. DC.) Rydh.89

Urticaceae

69. Celtis reticulata Torr. 190
70. Humulus Lupulus L., var. neomcxicanus Kels. & Cockerell 120
71. Parietaria pennsylvaniea Muhl. F 30
72. Urtica gracilis Ait. 174, F 262
73. U. viridis Rydb. 173

Loranthaceae

74. Arceuthohium eyanocarpum A. Nels. 99
75. Phoradcndron juniperinum Engelm. 157

Polygonaceae

76. Eriogonum alatum Torr. 213
77. E. cernuum Nutt. 305, F 54, F 306
78. E. fasciculatum Benth. 62
79. E. flavum Nutt.
80. E. Jamesii Benth. 34, 35, 189, F 54
81. E. lachnogynum Torr. 214
82. E. microthecum Nutt. F 54
83. E. polyeladon Benth. 62
84. E. racemosum Nutt. 247, F 40
85. E. Wrightii Torr. 62, 63
86. Polygonum avieulare L. 191, F 45, F 223, F 303
87. P. Douglasii Greene 204, F 45
88. P. ramosissimum Michx. 204
89. Rumex crispus L. 107, 134
90. R. mexicanus Meisn. 107, 134, F 146

Chenopodiaceae

91. Allenrolfea occidentaJis (Wats.) Kuntze. 227, F 280
92. Atriplex arg.mtea Nutt. 149, 150
93. A. eaneseens (Pursh) Nutt. 147
94. A. confertifolia (Torr. & Frem.) Wats. 149, 150
95. A. ohovata Moq. 149
96. A. rosea 1,.149
97. A. Nuttallii Wats. 149
98. Chenopodium album L. 293

99. C. Botrys L. 84
100. C. capitatum (1,.) Asch. 297
101. C. Fremontii Wats. 292
102. C. incanum (Wats.) Heller 292
103. C. leptophyl1um (Moq.) Nutt. 292, 2:14
104. Corispermum hyssopifolium L. 108, F 40, F 306
105. Eurotia lanata (Pursh) Moq. 160
106. Kochia Scoparia (L.) Schrad.
107. Monolepis Nuttalliana (R. & S.) Wats. 2\1G
108. Salsola Kali L. 110
109. S. Kali L., var. tragus DC. 38
110. Sareohatus veJ'micuJatus (Hook.) Torr. 148
111. Suaeda depressa (Pursh) Wats. 280

Amaranthaceae

112. Amaranthus blitoides Wats. 236
113. A. graecizans L. 236
114. A. graecizans L., var. pubeseens Uline & Bray F 40
115. A. retroflexus L. 236, 295, 298
116. Cladothrix lanuginosa Nutt. F 40, F 224

Nyctaginaceae

117. Abroniu Bigelovii Heimerl F 44
118. A. cycloptera Gray 208
119. A.fragrans Nutt. 208
120. Boerhaavia sp. F 224
121. Mirahilis multiflora Gray 71
122. M. oxybaphoides Gray 72, 197
123. M. oxybaphoides Gray, var. glahrata Heimerl F 45
124. Oxybaphus Bodini Holz. F 305
125. O. linearis (Pursh) Robins. F 44, F 45, F 197
126. O. melanotrichus (Standl.) Weatherby 72, F 197
127. O. nyetagineus (Michx.) Sweet., var. pilosus Gray 72, F 197
128. Selinocarpus diffusus Gray 72

Illecebraceae

129. Paron.ychia Jamesii Torr. & Gray F 306

Caryophyllaceae

130. Aisine Jamesiana (Torr.) Heller F 109
131. Arenaria Fendleri Gray 57, F 223, F 305
132. Cerastium longipedunculatum Muh!. F 45, F 109
133. Silene laciniata Cav. F 40, F 44
134. S. Pringlei Wats. F 306
135. Stellaria Jamesiana Torr. F 44

Portulaceae

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ALPHABETICAL LIST OF GENERA

PART III
USES

In the fol1owing sections on the uses of plants in the treatment of disease, the arrangement is, for the most part, by organ systems. Under each such main heading are grouped the pertinent diseases, pharmacological purposes, or ceremonials. Each section, where possible, contains general information concerning ceremonials used for the disease group, methods of preparation of the medicines, Navajo family names for the plants pertaining to the group, etc. Numerals in parenthesis, preceded by N, refer to numbers of the Navajo names in Part 1. There follows a list of the botanical names of plants, each of which was designated for the use in question by more than one informant. Numerals in parenthesis following these names denote the number of such independent informants.

From one to thirty-four additional species for each use were designated by single informants. The total number of such uncorroborated designations was 789. Likewise from one to eight prescriptions for given uses were individually recommended. Ninety-three uncorroborated prescriptions, containing from two to twenty-six species apiece, 17 were obtained. Since such uncorroborated designations may represent individual practices rather than general usage. it was felt that the space necessary to present them could well be saved, and that the few specialists who might be interested in them would be wilIing to communicate with the authors for further details.

In describing methods of preparation. the quantities used or administered are not mentioned, for the Navajo are seldom definite about quantities, except in the case of poisonous or "strong" herbs[18], "One plant," "several plants," a "handful of ground plants," a "pinch" of powdered material, soaked or boiled in "a cupful," a "pailful,'" or "some" water are characteristic directions; likewise, "drink some and wash all over," "drink one or two cupfuls," "drink a little," "drink a pailful" (usually a lard pail), or "apply some," and "take until cured." The usual practice is to use several good sized "pinches" in a medicine cup (abalone, turtle shell, glass, or enamel) of dried and powdered herbs for infusions, and a handful or two in a medicine pot or lard pail of whole herbs or root for decoctions. Larger quantities of herbs and ordinary water pails are used in preparing emetics, and several handfuls of herbs in a medicine basket for certain infusions, e. g., lightning herbs[19].ln Liquid medicines'to be taken internally are usually applied externally as well.[20] When only a cupful is given, the remnants after drinking are rubbed upon the arms, chest, face, and elsewhere if the amount suffices. With larger quantities, e. g. emetics, the whole body is thoroughly bathed in ceremonial order. Other decoctions are usually taken internallyonly. Decoctions are commonly salted (often with native salt) just before administration, with enough salt "to make it taste right."

Herbs to be powdered are dried, ground upon an ordinary corn grinder, and stored in small medicine bags which
are often kept in a singer's bundle. Bundles of such herbs or roots may be seen hanging to dry from the roof beams in singers' hogans. Fresh herbs, e. g. those for emetics, are pounded and mixed upon a flat rock shortly before using them. Any plant medicines, even those pertaining to a ceremonial, may be used by the laity, and are thought to be effective, without an accompanying ceremonial and without the advice of a singer.

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17. Certain preparations, especially emetics. are likely to contain many ingredients. In other instances the praetitioner may not attempt to obtain all the known ingredients, but only as many as he can find conveniently. Certain plants may be considered as essential ingredients for a prescription, effective when used alone, but if more can be obtained so much the better. Some practitioners (especially herbalists) favor large prescriptions, while others are inclined to use fewer plants.

18. The same applies to preparation of foods or dyes; see Reichard, 1936, p. 47.

19. See Kluckhohn and Wyman, 1940, p. 52; also pp. 48-57 for further information concerning the preparation and administration of medicines.

20. An obsolete custom followed when the patient was too ill to swallow was to support him head downwards and administer medicine per rectum, using a bison horn or a sheep’s leg bone as a funnel. Enemas were not used for constipation.

Certain preparations acquire extra curative powers while being prepared in a ceremonial, and remnants may be eagerly sought by practitioners and laity alike.[21] Knowledge of the properties of herbs, however, is said to be the only essential for their effective use, "Different plants specific for various diseases were created for the Navajos by the Holy People when they were living on this earth. They were tested on the first patients and have been used ever since."

HEAD AND NECK

Diseases of the head and neck may be treated by chants of the God-Impersonators, Wind Chant. or Eagle Trapping Sub Groups,[22] so certain plants (N 1, 2) pertaining to these chants (including Game Way plants-N 146) may be remedies for such conditions.

Headache[23]

Chant lotion (e. g. Monarda pectinata [5] and other labiates) and odorous grass, Hierochloe odorata (which is chewed by the singer and spit upon the patient)[24] (3), are considered especially good for headache and fever. Infusions are usually employed as head lotions, but fumigation may be used; see *snuff*.

Clematis ligusticifolia (3).

Hair Lotion

Soapweed root (*Yucca buccala* or *Y. glauca*) is used generally to make a suds for shampooing the hair. Arternisia spp. (A. campestris-2) may be added for its fragranee or to make the hair "long and soft" and prevent its falling. Other plants may be used in shampooing to prevent falling hair and dandruff, or as hair restorers.-

Earache

Remedies for earache are usually prepared as warm infusions and poured into the external meatus.

Cryptantha Jamesii, var. multicaulis (2).

Eye Disease

Remedies for sore or aching eyes (and accompanying headache) (na ?aze?) may be designated by the Navajo family name "eye wash" (nake ?ati). Since eye diseases (along with other head disorders) may be treated by Night Way or Plume Way (in which Game Way plants are used) eye medicines are among the plants used in these chants (N 1, 2, 146). Various species of *Cirsium* predominate. Eye medicines are usually prepared by cold or warm infusion and used as eye washes or drops, and the whole head is often bathed to relieve headache and swelling about the eyes. Hole fumigation[25] or the application of dry powder may also be used.

Cirsium spp. (7), *Houstonia rubra* (3), *Ditaxis cyanophylla* (2), *Lonicera arizonica* (2), *Melampodium leucanthum* (2), *Oenothera spp.* (3), *Peteria scoparia* (2), *Pseudocymopterus montanus* (2), *Senecio Hartianus* (2).

Snuff

Plants which are dried, powdered, and sniffed into the nose to relieve various head disorders, particularly nose troubles, may be designated by the Navajo family name "snuff" (N 252, 253). Remedies for catarrh, swellings or sores in the nose, etc., are called "running nose medicine" (N 123). Informants describe relief from this condition as "pieces of bone coming out of the nose or mouth." Snuff may also be used for headache, toothache, or sore eyes.

Aster ericaefolius (9), Linum spp. (5), Erigeron spp. (5), Aplopappus spp. (3), Baccharis Wrightii (2), Physaria Newberryi.

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21. See Kluckhohn and Wyman,1940, p.96.
22. See Wyman and Kluckhohn. 1938, p. 6.
23. Massage may be used for headache; see Kluckhohn and Wyman. 1940, p, 63.
24. lbid., p, 84.
25. See *ibid.*, p. 56, for details on this treatment.

Mouth Disease

The use of lichens as remedies for sore mouth or gums is a widespread practice.[26] Plants used for canker, swollen gums, decayed teeth, etc., are chewed.

Parmelia molliuscula (2), Peltigera sp. (5), Mirabilis spp. (2), Aster ericafolius (3), Sanvitalia Aberti.

Toothache[27]

The plants most commonly used for snuff may also be used for toothache. The leaves or root are crushed or powdered and placed in the cavity of the aching tooth or rubbed upon the gums around it.

Aplopappus spinulosm (2), Penstemon spp. (3).

Sore Throat

Eagle Way, Bead Way, or Plume Way may be used to treat sore throat, so plants pertaining to these chants may be used (N 1, 2). Decoctions are drunk and applied as lotions and poultices of the plant are applied to the throat.

Eriogonum spp. (7), Oenothera spp. (3).

RESPIRATORY SYSTEM

Lung trouble may be treated by Shooting Way or Navajo Wind Way. Infusions or decoctions of the plants are drunk.

Colds, Grippe, Influenza, Cough

Brickellia spp. (2), Pericome caudata (2), Sophora sericea (2), Sphaeralcea spp. (2), Marrubium vulgare (2).

Tuberculosis

Brickellia spp., Pericome caudata, Sophora sericea, Anemopsis californica.

CIRCULATORY SYSTEM

Heart Disease

Heart disease may be treated by one of the Wind Ways. Only four uncorroborated species were recommended for tachycardia, shortness of breath, etc.

Hemostatics

Plants used as hemastatics may be designated by the Navajo name "vein spurter" (N 87). The usual method of administration is to chew the plant and spit the juice upon the bleeding wound (an infusion or a poultice may be similarly applied). For nosebleed or lung hemorrhage infusions are drunk or applied to the head.

Linum spp. (2), Gayophytnm Nuttallii (2), Erigeron flagellaris (2), Astragalus sonorae (2), A. pictus (2).

ALIMENTARY TRACT[28]

Indigestion

Stomach-ache (bidini-): since abdominal trouble may be attributed to any one of a variety of etiological factors, plants pertaining to a number of Chant Ways may be used to treat it. Various small species of *Euphorbia* seem to be widely used for abdominal pain. Decoctions are most commonly used. Various plants are recommended for anorexia, gas, eructation, heart burn, as well as for pain and acute or chronic indigestion.

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26. See Vestal and Schultes, 1939, p. 12; Whiting, 1939, p. 99; Robbins, Harrington and Freire-Marreco, 1916, p. 68

27. To pull a tooth tie a sinew about it, attach this to a buckskin thong tied to a stick, and jerk out the tooth while the patient lies on his back. See N 161.

28. The Navajo do not use special diets nor fasting in illness, for: “How could a patient get strength without eating?” “Give himn akl he can eat, especially corn meal.”

Euphorbia spp. (9), Marrubium vulgare (3), Berberis spp. (3), Erigeron spp. (3), Brickellia grandiflora (2), Chrysopsis villosa (2), Frasera paniculata (2), Gilia spp. (2), Kochia scoparfa (2), Plantago spp. (2), Sidalcea neo-mexicana (2), Sisymbrium linearifolium (2), Solanum spp. (2).

"*Aorta medicine*" (?a'yas ?aze?) : the term apparently refers to the aorta ("tube next to the backbone"), specifically to that portion of the abdominal aorta just above the bifurcation of the iliacs (A), although a few inform-ants may use it to refer to the trachea. Informants describe an obscure sensation as "beating or moving of the aorta" which is probably due to some digestive disorder. Informant A said that it is the usual designation for hunger pangs.

Frasera paniculata.

Cathartics

Cathartics may be prescribed for constipation, abdominal pain, gas in stomach, "infection inside," or "pus in lungs or stomach." Although numerous plants were designated by single informants there was agreement only on various species of *Penstemon* (4). They may be called "cathartic" (N 162).

Diarrhea

The following remedies for diarrhea or dysentery are especially recommended for children and infants ("summer complaint"). Decoctions are drunk. Powdered argillaceous sandstone also may be taken in water.

Eriogonum spp. (3), Euphorbia serpyllifolia, (3), Marrubium vulgare (3).

Emetics

Each five- or nine-night ceremonial requires an emetic[29] and many plants are used for this purpose. Although the commonest emetics are from various botanical families, members of the *Equisetaceae, Pinaceae,* several families of the *Monocotyledoneae*, and *Rosaceae* predominate. They may be designated by some combination of the Navajo family name "emetic" (?i lko). Besides their general ceremonial use they may be recommended for stomach distress, nausea, anorexia, biliousness, acne, and bites of venomous animals. They are prepared by decoction and fairly large quantities are taken warm. Prescriptions containing many species are usually employed. Personal experience indicates that they are not especially effective, vomiting being induced by the volume of warm, bitter fluid taken and by throat tickling, so that their value probably lies mostly in stomach lavage.

Equisetum spp. (7), Juniperus monosperma (3), Juniperus sibirica (7), Picea pungens (6), Pinus chihuahuana, (4), Pinus edulis (2), Pinus flexilis (4), Pseudotsuga mucronata (3), Typha latifolia, Phragmites communis (2), Eleocharis palustris (3), Juncus balticus (6), Iris missouriensis (2), Salix spp. (3), Quercus utahensis (2), Eurutia lanata (2), Aquilegia spp. (2), Clematis spp. (3), Tha1ictrum Fendleri (2), Berberis spp. (4), Stanleya pinnatifida (2), Ribes pinetmoum (3), Amelanchier spp. (4), Cercocarpus spp. (5), Cowania Stansburiana (3), Prunus melanocarpa (6), Rosa spp. (3), Purshia tridentata (4), Astragalus spp, (3), Parryella fitifolia (4), Pachystima myrsinites (6), Ceanothus Fendleri (5), Mentzelia spp. (2), Pseudocymopterus montanus (7), Arctostaphylos spp. (8), Forestiera neomexicana (2), Lonicera spp. (3), Bigelovia graveolens (3), Briickellia grandiflorum, var. petiolaris (4), Gutierrezia Sarothrae (3), Tetradymia canescens (3).

MUSCULAR SYSTEM

Muscular Soreness and Stiffness

Only four uncorroborated species and two prescriptions were obtained, infusionns to be used as lotions and to drink. Use of the sudatory and massage were also recommended.

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29. See Kluckhohn and Wyman, 1940, pp. 85-86, for a description of the ceremonial preparation and use of emetics, and pp. 122 and 162 for prescriptions.

Sprains, Strains, Bruises, Swellings

Although Life Medicine (see below) is usually employed for such conditions, four uncorroborated species and three prescriptions were also mentioned. Infusions are used as lotions and to drink or poultices are applied. Other treatments are application of powdered argillaceous sandstone in water, incision of a bruise or sprain to remove blood and admit medicine, and baking over hot rocks.

Rheumatism

Rheumatism or swollen, painful joints, is sometimes treated by Beauty Way or ascribed to witchcraft, so Beauty Way decoction or "witchcraft plants" (N 183) may be used to treat it, as well as other plants.

Arthritis, especially arthritis deformans in males ("hump back," "break your bones"), is ascribed to improper contact with a menstruating woman or menstrual blood. The Navajo family name for arthritis medicine, therefore, is the same as the word for menstruation (N 95).

Both types of remedies are usually prepared by decoction, to drink, or for lotions.

Rheumatism: Bigelovia gmveolens (2), Mirabilis spp. (2), Senecio spp. (4), Sisymbrium linearifolium (2), Wulfenia, plantaginea (2).

"*Arthritis medicine*"[30] *Corydalis aurea (5), Bahia dissecta. (4), Senecio spp. (2).*

NERVOUS SYSTEM

Narcotics

The only effective narcotic used by the Navajos as yet discovered is *Datura spp*. The root may be chewed or infusions of it may be drunk to produce narcosis during minor operations, in divination, and in witchcraft.[31] ("Throw in face or put in cigarette if you do not like someone.") Its poisonous properties are well known to the Navajos and they handle it with caution.

Datura meteloides (4).

Fainting or dizziness

Fainting may be considered a sign of ghost infection, so one of the Evil Way ceremonials and its associated plants (e. g. *Tetradymia canescens, var. inermis*-N 122) may be used to treat it.
Nicotiana attenuata (2) (blow smoke in patient's face).

Menta1 Disease[32]

Mental disturbance may be treated by some form of Blessing Way, a chant of the Mountain Chant Sub-Group, or Hand Trembling Way. Bad dreams[33], dread of harm or evil, and the like, may be attributed to ghost infection and treated by an Evil Way ceremonial. Plant remedies are prepared by decoction.

Potentilla spp. (3).

Mild mental disturbance: "thinking or talking bad," "thinking of running away," and other slight mental aberrations may be treated by a smoke treatment which is associated with Blessing Way. This consists of smoking mountain tobacco (*Nicotiana attenuata*) mixed with one or more other plants, e. g. *Verbascum Thapsus* (2) (N 235), in a prehistoric pipe found in a ruin.

Miscellaneous

Three uncorroborated species were recommended for insomnia, and one prescription for basal ganglion disease (according to description of symptoms), to be applied to scarifications. One informant recommended Water Way and its associated plants for paralysis.

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30. Incise skin over swollen joints to suck out “poison blood” and admit medicine; cauterize “growing bone” in limb with a willow stick covered with adboe, then apply medicine.
31. See Wyman and Kluckhohn, 1938, p. 25; Hill, 1938a.
32. See Hill, 1936.
33. Cf. Lincoln, 1935, p. 207 ff.

GENITO-URINARY SYSTEM

Diuretics

Diuretic plants are often named as such, i. e. "urine spurters" (N 4). Kidney and bladder disease may be attributed to red ant, snake, or deer infection, and treated by Red Ant Way, Beauty Way, or Plume Way (with Game Way plants) respectively, so diuretics may be included among the medicines specific for these ceremonials. Diuretics are recommended for venereal disease, hematuria, pelvic pain, and bladder stones as well as for anuria. Decoctions are used.

Hieracium Fendleri (3), Plantago major (3), Wulfenia plantaginea (2), Urtica spp. (2), Ephedra Torreyana (2), Agoseris purpurea (2), Lotus Wrightii (2), Parosela lanata, (2), Grindelia aphanactis (2), Lepachys spp. (3), Verbena bracteata (2), Thelesperma spp. (2), Zinnia grandiflora (2), Astragalus spp. (3), Geranium spp. (2), Anemopsis californica ("main plant" in one prescription).

Venereal Disease[34]

Most remedies for venereal disease are for treatment of local symptoms only. Dusting powders, lotions, or poultices are applied to chancres or swollen, sore genitalia and decoctions or infusions are drunk for gonorrhea, syphilis, or orchitis. See diuretics.

Asclepias involucrata (2), Lupinus Kingii (2), Eriogonum racemosum, Dithyrea Wislizeni.

Aphrodisiacs

For aged men, women, or stud animals. Infusions are drunk.

Commelina, spp. (3).

Contraceptives

Decoctions are drunk during menstruation. Used by both sexes.

Eriogonum Jamesii (3), Bahia dissecta.

Sexual Infection (yiste'z)

This term designates disease attributed to ceremonially improper sexual intercourse (e. g. sore eyes, headache, pain in bones) or to intercourse too soon after childbirth ("pus in stomach" in females). Infusions are drunk or, more commonly, the plants are used as ingredients of bison fumigant[35], which is administered by hole fumigation (sprinkled on hot coals in a hole over which the patient sits, covered by a blanket). This treatment may be added to a Life Way and other ceremonials.

Ephedra Torreyana (2), Lepachys tagetes (2), Zinnia grandifiora (2), Sphaeralcea .'Ipp. (2), PHoralea lanceolata (2)

Dysmenorrhea (Menstrual Pain), Menorrhagia

Decoctions are usually employed.

Cordylanthus Wrightii (3), Orthocurpus purpureo-al bus (3), Corydalis aurea.

Parturition[36]

Plants used in connection with parturition may be designated by the Kavajo family name "baby medicine" (?awe' ?aze'?). The two most commonly used are called "placenta boiler" (N 11-13). Decoctions are used.

To expedite delivery (prolonged labor): an unraveling ceremony[37] using "unraveling medicine" Townsendia spp. (2) (N 46) is often employed.

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34. See Haile, 1938, p. 68.
35. See Kluckhohn and Wyman, 1940, p. 56, for prescriptions, use, etc.
36. Miss Flora L. Bailey is conducting a comprehensive field study of practices connected ith the reproductive cycle among Navajo women.
37. See Kluckhohn and Wyman, 1940, p. 77, for details of this ceremony.

Townsendia spp. (2), Gutierrezia Sarothrae.

To facilitate delivery of placenta ("to clean out blood," retained placenta, pain, distention): Chrysothamnus depressus (31), Penstemon coloradoensis (29), Penstemon spp. (4), Franseria spp. (4), Townsendia spp. (2), Gutierrezia Sarothrae (17), Actinca spp. (2), Gilia spp. (3), Hymenopappus gloriosus (2), Petalostemum oligophyllum (2), Sisymbrium linearifolium (2).

To stop postpartum hemorrhage: *Artemisia tridentata (3), Artemisia spp. (16), Ephedra Torreyana (2), Lathyrus gramnifolius (2), Verbena bracteata (2).*

For postpartum pain: Juniperus sp. (the common juniper) (32), Artemisia spp. (16).

"Baby Medicine" (use postpartum to expedite recovery) : Castilleja spp. (2), Cryptantha Fendleri (2), Psoralea lanceolata (2), any of the species listed above.

Lactagogues

Preparations are drunk and applied to the nipples (for women or goats).

Asclepiodora decumbens (2), Euphorbia serpyllifolia.

SKIN

Wounds

Life medicine is used for wounds; thus many of the following plants are also in that group (see also sores). Preparations used for infected wounds (and when castrating stock animals) include poultices, dusting powders, and infusions for lotion or to drink. Wounds may be sutured with bison or deer sinew.

Artemisia spp. (4), Eriogonum spp. (3), Gaura spp. (2), Orobanche fasciculata (2).

Sores

Among the medicines for open sores on the skin the use of *Orobanche* and plants superficially resembling it, such as *Pterospora* and *Corallorrhiza*, is of interest. The use of the dry spores of members of the *Lycoperdaceae* is widespread.[38] Usually the plants are dried, ground, and applied to sores as dusting powders, especially to heal an infant's navel. Poultices or infusions as lotions may also be used. Prescriptions used for bunls or itching (see below) are also used for sores.

Orobanche fasciculata (2), *Penstemon trichander* (3), *Peltigera sp.* (5), *Corallorrrhiza multilflora* (4), *Astraeus hygrometricus* (2), *Pterospora andromedea*, decayed wood (2), *Rumex sp.* (root), sheep fat.

Burns

Medicines for burns and scalds may be designaterl by the Navajo family name "fire medicine" (N 197).[39] Members of the Nyctaginaceae predominate, Preparations include dusting powder, poultices, ointments (with sheep grease and red ochre), and infusions for lotions. These are also used for sores.

Mirabilis oxybophoides (and var. glabrata) (4), Oxybaphus spp. (4), Asclepias involucrata (2), Penstemon spp. (4), Gaura coccinca (2), Artemisia spp. (4), Corallorrhiza multiflora (2).

Boils

Plants used to treat boils or abscesses may be designated by the Navajo family name "boil medicine" (c'oz ?aze'?). Boils may be attributed to eagle infection, and treated by Eagle Way or Bead Way,[40] with "eagle plants" (N 1).

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38. See Vestal and Schultes, 1939, p. 12; Robbins, Harrington, and Freire-Marreco, 1916, p. 67; Gilmore, 1919, p. 62.

39. See Kluckhohn and Wyman, 1940, p. 57, for description of a special ceremony for burns involving the use of Juniper bark which has been used in the "Fire Dance" of a Mountain Top Way.

40. See Wyman and Kluckhohn, 1938, p. 29.

Boiled eagle meat may be eaten. Life medicine also is an appropriate treatment. Preparations include poultices, dusting powders, and lotions. Boils are lanced with cactus spines.[41]

Lupinus Kingti (3), Evolvulus pilosus (2), Opuntia spp., Asclepias spp. (2), Abronia spp. (2), Atriplex spp. (2), Artemisia spp. (2).

Pimples

Plants used for pimples are often named "pimple medicine" (N 245). The crushed or moistened leaves are applied to the skin, or infusions are used as lotions.

Erigeron canadensis (7), Asclepias galioides (3), Erysimum asperum (3).

Itching

Medicines to relieve itching of the skin are usually prepared as infusions and applied locally as lotions, but poultices or ointments (with red ochre in mixed salve[42]) may be used. Among the conditions for which such medicines are appropriate, informants mentioned chicken pox, small pox, measles, erythema multiforme, scabs, cold sores, sunburn, chapping, frozen feet, corns, poisoning from poison ivy or other plants, and mosquito or other insect bites. Dusting powders are used as deodorants and for itching of feet or axillae.

Atriplex spp. (2), Iva xanthifolia (2), Amaranthus spp. (3), Dithyraea Wislizeni (3).

Warts

Warts are treated by cutting them or tying horse hairs around them and applying certain plants. Two prescriptions, or *Phoradendron juniperium* with a wart-like growth on chamiso *(Atriplex canescens)* were recommended for this purpose. Another treatment is to burn some powdered pith of *Helianthus annuus* upon a wart (3).

INJURY BY VENOMOUS ANIMALS

Red Ant

Diseases (especially kidney and bladder disease, sudoresis, and stomach distress) attributed to swallowing a red ant (in food or water), or to other types of "red ant infection," may be treated by Red Ant Way; hence plants used for these conditions may pertain to this Chant Way. Decoctions or infusions of the plants are taken internally and are said to "kill the ant." Itching and sores caused by red ant bites are treated by applying decoctions or infusions as lotions, or by chewing the leaves of the plants and applying them as poultices. The plants may be designated by the Navajo names "red ant medicine" (N 303), "red ant killer" (N 304), "red ant food" (N 305), or included in the Navajo family or form genus "red ant decoction" (N 306). See diuretics.

Grindelia aphanactis (12), Eriogonum cernnum (5), Gutierrezia spp. (7), Androsaeae septentrionalis, vars (4), Dyssodia spp. (3), Lepachys spp. (3), Aetinea leptoclada, var. lvesiana (2), Zinnia grandiflorum (2), Thelesperma spp. (2).

Beetle

For bite of a certain black beetle, drink a decoction (or infusion) of *Croton texensis*, with *Abronia spp.* ("beetle food"-N 208).

Centipede

For centipede bites apply an infusion or a poultice of the blossoms of Penstemon trichander and *Castilleja integra.*

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41. See Vestal and Schultes, 1939, p. 45
42. See Kluckhohn and Wyman, 1940, p. 47

Spider

The bites of venomous spiders (e. g. the black widow) are treated by drinking, or applying as lotions, decoctions, or infusions of plants which may be designated by Navajo names referring to the spider (N 223-225).

Chara. sp. (2), Erigeron flagellaris (4), Androsacae septentrionalis, vars. (3), Petalostemum oligophyllum (3), Polygonum aviculare (2), Potentilla, spp. (2).

Snake

Snake bite: infusions or decoctions of the plants are taken internally and the leaves are applied as poultices. The skin may be incised to admit medicine. A singer at Chin Lee, Arizona, recommended several species whch have a milky sap (e. g. Euphorbia, Lactuca, and Sonchus asper) , together with Frasera paniculata ("big snake's plant"-N 285) and Physaria Newberry.[43] Beauty Way may be used to treat snake bite.

Snake infection: various diseases (e, g, kidney or bladder disease) may be attributed to snake infection and treated by chants in which snakes figure as etiological factors, especially Beauty Way (also used for snake bite), Shooting Way, and Navajo Wind Way. Certain plants pertaining to these chants may, therefore, be used for such "infections" (especially Beauty Way decoction).

Protection from snakes: Conioselinum scopulorum (2) -sprinkle infusion around hogan, snakes dislike its odor. Infusion with four other species-sprinkle on snake to kill it; chew and apply to face and body when away from home (e. g. attending a ceremonial),

CHANT LOTION

Most ceremonials require a chant lotion which is applied to the patient's body in ceremonial order, after which he bathes in it and drinks some.[44] The ingredients are mostly members of the Labiatae, although other fragrant plants may be used. Certain plants may be specific for given ceremonials. They may be designated by some combination of the Navajo family name "chant lotion" (keX'o). Chant lotion is used to relieve headache, fever. lameness, and general body aches and pains, and coughs, colds, and chills. Cold infusions are employed.

Hedeoma nana (5), Marrubium vulgare (2), Mentha spp. (16), Monarda spp. (12), Salvia spp, (5), Aquilegia spp. (3), Thalictrum Fendleri (3), Whipplea utahemis (2), Medicago spp. (4), Gaura coccinea. (2), Artemisia spp. (3), Brickellia grandiflora, var. petiolaris (3), Dyssodia papposa (2), Eupatorium herbaceum (2).

LIFE MEDICINE

Life Medicine, which is specific for the Life Way chants,[45] is perhaps the most widely known medicine among informants. Although an extraordinary number of botanical species (128) are said to be appropriate for this preparation, certain ones are considered basic. From two to six of these latter are used; and, if others belonging to the family can be found and added, "so much the better." Among the important ingredients members of the *Polygonaceae* and *Boraginaceae*, and one species from the Euphorbiaceae (*Ditaxis cyanophylla)* figure prominently. The latter, *Eriogonum lachnorlynum*, and *Lithospermum multiflolium* may be spoken of as the "heads" of Life Medicine. *D. cyanophylla and L. multiflorum* may be collected with great care, for as informants say "they are kind of afraid of it." About twenty feet from the plant to be collected, pollen is placed upon one of the same species, from east to west, from south to north, and twice around it sunwise, while praying. The root of the desired specimen is dug up, pollen is placed in the hole, the top of the plant is broken off and pollen placed on the bottom of the stems, the top is replanted in the hole, pollen is placed on the top. Meanwhile prayers to the plant and for its continued growth are said.

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43. See Whiting, 1939, p. 77

44. See Kluckhohn and Wyman, 1940, p. 51, for the preparation, use, and ingredients of chant lotion; also Wyman, 1936, p. 651; Franciscan Fathers, 1910, pp. 404, 405.

45. See Franciscan Fathers, 1910, pp. 144, 403; Wyman, 1936, p. 640; Wyman and Kluckhohn, 1938, p. 31; Kluckhohn and Wyman, 1940, p. 56.

If the top is not replanted, pollen is placed in the hole and the earth is carefully smoothed over it so as to leave no trace of disturbance, while praying for more to grow. Sometimes the plant is not uprooted but side roots are broken off, pollen placed on their ends and on the broken stub ("to make it grow"), and the plant left in situ, with accompanying prayers, Roots gathered in this way are called "live medicine" (?aze'? himi) and are thought to be more powerful, indeed so powerful that one treatment recommended for fractures was to bind two plants with roots down of Lithospermum nngu8tifolium on the right and left sides (south and north) and two of Eriogonum alntum on the front and back (east and west) of a fractured limb. (Shaped splints of cottonwood may also be used, tied with Equisetum sp.) Roots of Lithospermum angustifolium are inside the handle of the hoof rattle and certain other objects used in Flint Way.[46] The Navajo family name "life medicine" (?i-na-ji ?aze?) may be used for any of the plants in this group.

Usually the roots only of the plants are used, being dried and ground by a virgin during a Life Way chant to the accompaniment of special songs[47]. Life Medicine (and Life Way chants) is used to treat sprains, strains, fractures, swellings, bruises, wounds, burns, lameness, internal injuries, body pains, and any other results of accidents.[48] Hence its reputation as a cure-all. It is administered internally as a cold (occasionally warm) infusion or as a dry powder; it is applied to injured parts as a hot or cold poultice (occasionally as a lotion), and sometimes the roots are chewed. Because of the profusion of species obtained only those recommended by more than two informants are listed.

Eriogonum alatum (10), E. flavum, E. Jamesii (10), E. lachnogynum (3), E. racemoum (3), Rumex spp. (8), Oxybaphus spp, (6), Silene spp. (5), Potentilla spp. (5), Astragalus spp. (esp. A.lonchocarpus) (9), Oxytropis Lambertii (3), Hoffmanseggia spp. (3), Peteria scopnria (2), Psoralea spp. (5), Geranium spp. (9), Ditaxis cyauophyllu (5), Sphaeralcea spp. (10), Gaura parviflora (3), Oenothera spp. (7), Cryptantha spp. (5), Lithospermum spp. (13), Penstemon spp. (4), Artemisia spp. (5), Cirsium spp. (7), Gutierrezia- Sarothrae (11), Helianthella Parryi (4), Hymenopappus gloriosus (3), uncorroborated-73 species.

GENERAL BODY DISEASE

Fever

Chant lotion is used to reduce fever. Infusions or decoctions of other plants are drunk. The sudatory may be used

Artemisin Bigelovii (2)! Marrubium vulgare (2).

General Body Pain

Warm infusions of various plants are drunk for internal pain.

Gaura coccinea (2).

Witchcraft Plants[49]

Various diseases may be attributed to the effects of witchcraft, but especially generalized body pain of long duration, and rheumatism. Plants used against witchcraft may be called "witchcraft plants" (N 183). Infusions are used, usually warm. They may also be used for washing hands after handling plants used in witchcraft.

Penstemon spp. (6), Wulfenia plantaginea (3), Clematis alpina (2), Physaria Newberryi (2).

Miscellaneous

Various uncorroborated plants were recommended for malaise, as tonics ("makes children grow tall"), or to use with any or all medicines for any disease. Thus *Conioselinium scopulorum* is said to "join all medicines." Infusions are usually so employed. An infusion of *Castilleja integra* (10) may be drunk once a month throughout pregnancy to keep the baby small. *Plantago argyrea* is said to reduce appetite ("for fat babies").

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46. See Kluckhohn and Wyman, 1940, p. 43
47. *Ibid,* p. 56
48. Baking over hot rocks may be used with it.
49. See Kluckhohn, 1940

MISCELLANEOUS

Coagulant

The use of the seeds of *Solanum elaeagnifolium* to curdle milk (4) is a well known and widespread practice.[50]

Arrow Poison

A mixture of Rhus toxicodendron, *Phacelia crenulata*, *var. ambigua*, charcoal from a lightning-struck tree, and deer's blood.

Witchcraft

A witch may drop the fruit of *Sitanion hystrix* into the open mouth of a sleeping man in order to kill him. The pollen of five uncorroborated species may be used in bewitchment by spell.[51]

CEREMONIAL USES

Numerous plants are considered specific to the equipment or medicines of each ceremonial. Still others are used non-specifically for various ceremonials, or for the ceremonials of a group or sub-group. No attempt was made to compile a complete list so the following sections contain only those plants which informants voluntarily designated as having ceremonial uses while describing their therapeutic properties. Considerable information concerning the ceremonial use of plants has been given in the monograph by Kluckhohn and Wyman (1940), especially in Section 6, and a concordance of plant names in Appendix C. Other information may be found in the works of other authors, cited in the bibliography of this monograph and in the footnotes of Wyman and Kluckhohn, 1938. In the following list the diseases for which the plants were recommended have been omitted, since they have been given in previous sections. The etiological factors and general medical uses proper to the ceremonials mentioned below may be found in Wyman and Kluckhohn, 1938.

Non-specific

Blue pollen (N 264, 265): Delphinium Nelsonii (4), Oxytropis Lambertii (2), Penstemon oliganthus, Verbena MacDougalii, Geranium atropurpureum. The *Delphinium* is preferred for blue pollen, so the others are probably substitutes. The blue petals are dried, crushed, and sprinkled ceremonially in certain instances, similarly to the use of corn pollen.[52]

Fumigant plant (yadid? n'il): *Oxytenia acerosa* (2). Mixed with other substances, Oxytenia is sprinkled upon glowing coals and the fumes are inhaled.[53]

Odorous grass (N 301): Hierochloe odorata. (4). The singer chews some of the grass and spits it upon the patient and certain equipment.[54]

Prayer Ceremonies

The only plant medicine used is *Wulfenia plantaginea* (2).

Blessing Way

Smoke medicine: *Nicotiana attenuata* mixed with *Verbascum Thapsus* (2), mountain mahogany which has been brushed by the antlers of a deer, or other "tobaccos," five uncorroborated species-for mental disease or sick sheep (see mental disease). Mix juniper, pinyon pine, and Ponderosa pine needles, pinyon pitch, shavings from the horns of deer, elk, mountain sheep, and antelope, with ten other plants and burn in the corral for sick stock animals.

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50. See Vestal and Schultes, 1939, p. 50.
51. See Kluckhohn, 1940.
52. See Kluckhohn and Wyman, 1940, p. 91 for further details.
53. *Ibid.,* p. 49, for recipe and use of *fumigant*.
54. See Kluckhohn and Wyman, 1940, p. 84, for further details.

Holy Way Ceremonials

Lightning infection: plants used to treat the direct or indirect (infection) effects of lightning often pertain to one of the Shooting Way chants, although several Holy Way chants claim lightning as an etiological factor. They may be called "thunder plants" (?I n'I? c'il), and are mostly for the *decoction.*

Petalostemum oligophyllum (2), *Sphaeralcea marginata (2),*

Protection from lightning: Verbesina encelioides, *var. exauriculata*-hang the plant, top down, in the hogan at the west side, to ward off lightning, It functions as does a token.[55]

Red Ant Way

See red ant under injury by venomous animals and N 303-306.

Mountain Top Way

Several members of the *Rosaceae*, e, g, *Prunus melanocarpa*[56] (2), *Amelanchier,* and other plants which have berries, e. g. Berberis and Ribes; Erigonum spp. (3).

Night Way[57]

Salix Wrightii, Helianthus annuus-use stems for offering prayersticks. Lycium Torreyi-food for God-Impersonators.58

Plume Way

Lotus Wrightii (2), (N 2).

Game Way Plants[59]

Used in deer hunting for luck or to prevent deer infection.

Frasera venosa (2), (N 146),

Coyote Way

Forestiera neomexicana, Asclepias macrotis, (N 218),

Chiricahua Wind Way[60]

Rhus canadensis, var. trilobata-hoops; *Opuntia arborescens-cactus prayerstick.*

Eagle or Bead Way

Lupinus Kingii-decoction or chant lotion, (N 1).

Uncorroborated

Hail Way-l species; Water Way-8 species (N 96, 97); Shooting Way, Female Branch[61]-7 species; Beauty Way decoction-34 species; Navajo Wind Way[62]-12 species; Hand Trembling Way[63]-1 species,

Evil Way

Evil Way plants: *Tetradymia canescens, var. inermis* (8) (N 122), *Artemisia scopulorum* (3).

55. *Ibid*, p. 38
56. See Bailey, 1940, p. 289, "cherry bread"; Matthews, 1887, p. 450, the chokeberry is a sacred tree, a mountain plant.
57. See Matthews, 1902, pp. 41-48.
58. *Ibid*., pp. 106, 107, 224.
59. See Hill, 1938, pp. 134-143.
60. See Kluckhohn and Wyman, 1940, Part III, p. 140.
61. *Ibid,* Part IV, p. 161.
62. *Ibid*, see Part II, p. 111.
63. *Ibid,* see Part V, p. 169.

Prescriptions: *lightning herbs*[64] mixed with *Artemisia Bigelovii, A. Wrightii, Ceanothus Fendleri, Tetradymia canescens, var. inermis*, pinyon pine and juniper needles-administered with sudatory.

Decoction: Ceanothus Fendleri (3), Parryella. filifolia (2).

Emetic: Stanleya pinnatifida. (2), see *emetics.*

Unravelers: Bouteloua gracilis, Artemisia kansana, A. Wrightii, Gutierrezia Sarothrae, Andropogon scoparius, Pseudotsuga- mucronata

Hoops: Salix Wrightii, Forestiera neomexicana, Lycium spp. (2), Rosa neomexicana, Juniperus monosperma, Prunus melanocarpa.

Arrows: Pinus ponderosa, Pseudotsuga mucronata.

Fir and plant garments: *Pseudotsuga mucronata. Anropogon scoparius* and various other grasses.

Cinctures: Yucca baccata.

Misc.: Nicotiana attenuata--smoke; Aquilegia elegantula-seeds, use with odorous grass.

Mixed charcoal (for blackening)[66]*; Gutierrezia Salothrae (2); Bouteloua gracilis; Artemisia Wrightii (3); A. dracunculoides (2) ; A. frigida; Eurotia lanata (2) ; Tetradymia- canescens, var. inermis; Sorghastrum nutans; Salix Wrightii; Pinus ponderosa.* Dry the plants, burn to ashes on a hot plate, and mix with mixed salve.[67]

Enemy Way

Enemy Way plants or *medicine:*[68] *Juniperus monospenna (3); J. scopuum; Thalictr1tm Fendleri (or var. Wrightii) (3); Achillea lanulosa; Artemisia friqida (2) ; A. filifolia.*

Emetic[69] *Achillea lanulosa; Thalictrum Fendleri.*

Chant lotion: Juniperus monosperma (also use sharpened sticks for scratching, then dispose them); Thalictrum Fendleri (2), Aquileqia Spp. (2).

Odorous grass:[70] *Hierochloe odorata, Aquilegia elegantula (*seeds).

Mixed charcoal:[71] see under Evil Way.

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64. See Kluckhohn and Wyman, 1940, p. 52.
65. *Ibid*, p. 102.
66. *Ibid*, p. 55.
67. *Ibid,* p. 47
68. Haile, 1938, pp. 52, 72, 207.
69. *Ibid,* p. 44.
70. *Ibid,* p. 195. Since the species mentioned above are definite basic species for their Navajo names we are convinced that Fr. Berard's rendering as "peppermint and pennyroyal" is inaccurate.
71. *Ibid,* pp. 32, 191, 197, 233.

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