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SOME PLANT MATERIALS USED MEDICINALLY AND OTHERWISE BY THE NAVAHO INDIANS IN THE CHACO CANYON, NEW MEXICO*

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There are good reasons for examining the plants and other materials which come into intimate physical contact with the aboriginal peoples, especially when it is known that specific morbidity and mortality rates are at variance with those among civilized modern man. The study and recording of the medicinal, food, smoking, and similar plant and other materials for the New Mexican area is far from complete, as voiced by Dr. Paul C. Standish (ca. 1947):

Very little has been done in the field of ethnobotany in New Mexico, that every addition to knowledge of the subject is bound to have importance from the standpoint of folklore and quite possibly also in a practical way. (1)

Drs. A. H. and D. C. Leighton (20) who lived among the Navaho for several years have noted the occasional greater efficacy of Navaho medical treatment over that of the white man.

* One of the most interested and helpful of the patrons of the Department of Ethnology at the Museum of New Mexico is Mrs. Verda Josey of Aztec, who has been lending specimens and making gifts to the Department ever since its beginning. In 1941, Mrs. Josey presented a small collection of native dye plants and examples of yarn colored with them, as prepared by one of her Navaho friends. The following year, she gave eighteen specimens of plants used by the Navaho as foods and for medicinal purposes, along with certain other ethnologic items. Then, in 1943, she sent in a collection of forty-five specimens which were collected in the Chaco Canyon, relatively close to the ancient ruin site of Pueblo Bonito.

The first gift and most of the second lot were placed on display in the Hall of Ethnology. In April, 1950, Professor George M. Hocking, Professor of Pharmacognosy and Pharmacology at the University of New Mexico, visited the museum and expressed his interest in our plant collections. As a result, it was arranged that he take the specimens not then being exhibited for the purpose of identification and study in relation to the uses indicated by the Navaho collectors.

When Professor Hocking was called for service with the Pakistan government, he resigned his position in New Mexico, in 1951. He is one of the best known authorities on medicinal plants, and is widely known for his scientific papers. He is author of *A Dictionary of Pharmacognosy and Economic Botany*, and has in preparation a volume on field study of medicinal plants. Currently, Dr. Hocking is a professor of pharmacognosy at the School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama.

Professor Hocking presented a paper on this material before the American Association for the Advancement of Science meeting, in Atlanta, Georgia, December 29, 1955.

† The author wishes to thank the director and staff members of the U. S. National Herbarium, Washington, D. C., for their kind assistance on several personal visits; Miss Velva Rudd proved especially helpful. Other assistance is appropriately acknowledged in each instance.

1. See References.
2. Grateful thanks are due to Dr. Bertha P. Duttron, Curator of Ethnology, Museum of New Mexico, for loan of the materials, collecting data, etc.
Herbarium and elsewhere and with the assistance of various specialists (as credited), nearly all eventually were identified with a good degree of certainty. One specimen was quite hopeless and in seven other instances, while the genus may be definite enough, there is some question as to species.

Although the use of a few of these plants has been reported previously, most appear new to the record as far as could be learned from a literature search. In the listing which follows, the botanical name and common names are immediately followed by the date passed on by the informants (this has sometimes been re-worded or a paraphrasing of other pertinent information supplied by the literature). To the compilation of medicinal plants based on identified material specimens is appended a list of plant species which according to Mrs. Josey are used in one way or another by the natives of the same part of New Mexico.

Species Identified From Specimens


The specific name is too restrictive since this species has been found in at least six western states. This plant has not previously figured as an economic species, but it is well known that the fruit of the various Amelanchier species have been popular with the Indians, both in the fresh state and dried-preserved for winter food usage. Some species have been used by the Navaho as emetics (4); some have been shown to contain hydrocyanic acid glycoside (Greshoff). [Catalogue No. 2-53/70 S.A.R.]

Aster parviflorus A. Gray (Machaeranthera parviflora Gray; A. parvulus Blake). (Compositae). Used as a purgative.

Several other species of Aster are reportedly used by the Hopi Indians (5). A. arenosus (Heller) Blake is said to be used as a snuff and in oral diseases by the Navaho (2) and A. canescens Pursh likewise (16). [No. 2-53/97.]


3. School of American Research catalogue number follows each identification.

May, June, 1956

This common shrub is widely distributed in the western states and northern Mexico. Used variously, the plant has proved so valuable that it is sometimes called the "alfalfa of the desert." The parched seeds are made into a flour or meal, which is often admixed with other meals (4). The herbage offers important drought and fall/winter forage. The Navaho Indians are reported to use preparations of the plant in such skin conditions as boils, warts, and itch (9); they used this and other A. species by topical application for stings of hymenopterous insects, and as a yellow dye for wool (16). The Indians in southern New Mexico use the plant with salt and water for stomach pain (1). [No. 2-53/59.]

Atriplex confertifolia (Torr. & Frém.) S. Wats. Salt Weed. (Spinifex) Saltbush. Shad-scale. This plant is rubbed on horses to repel gnats.

According to the literature, it has served as a winter browse (4) furnishing salt (16); the seeds have served for human food. [No. 2-53/102.]

Chenopodium album L. (Chenopodiaceae) Goosefoot. Lamb's Quarters. Used as a nutrient: the seeds are ground and eaten.

Among the Navaho, the seed meal is used in preparing mush or porridge, cakes (sometimes with corn meal), stews, etc. (1). The leaves enter the cooked meal as greens or even raw (16). [No. 2-53/67.]

Gleome serrulata Pursh (probably) (G. integrifolia T. & G.; Peritoma serrulatum DC.) (Capparidaceae) Rocky Mountain Bee Plant. Used as a seasoning.

Young plants of the genus are used as pothobs by the Indians of Arizona and New Mexico (3). The Navaho eat the pods (16); the Tewa Indians, who live to the east of the Navaho in New Mexico, eat the boiled plant along with cornmeal porridge (15). Under the name guaco, this plant is considerably used medicinally by the people of New Mexico (1). The herbage when crushed gives off a very unpleasant odor, for which reason the plant is sometimes called "sinkweed." This odor fortunately is lost in cooking (16). [No. 2-53/72.]

4. Note: Dr. Dutton states that hardened cakes of guaco are soaked in hot water, and then fried in grease and eaten by the Tewa. Guaco is also mixed with water and used as a pigment for painting pottery; it fires a deep black color, or provides the matte finish for black burnished-and-matte wares (24).
Comandra pallida A. DC. (Santalaceae). Bastard Toadflax. Used for corns, the feet being soaked in a water decoction of the plant.

The fruits have been eaten by the Indians of Nevada (11). [No. 253/75]

Cosmos (?) (Compositae). The name "jilla flower" was penciled on the attached note. This vernacular name (Navaho?) could not be found in reference works. (C'il is Navaho for plant.) Used for burns.

Acturally the specimen was too poor for adequate and positive identification. [No. 253/77]

Cryptantha fulvocelescens (A. gray) Payson (Boraginaceae). This plant is boiled in water and the decoction taken at childbirth.

No usage seems to have been published heretofore; however, Vestal (25) notes use in "birth injury" of C. jamesii. Some Cryptantha species are foraged. [No. 253/64]

Cucurbita pepo L. (Cucurbitaceae) Pumpkin. Leaves are used for "upset stomach."

As with the white population, the New Mexico Indians use the fruit pulp of this widely grown plant as a food. Additionally, they eat the seeds. C. foetidissima HBK. is used in a similar manner, and a number of medicinal applications for this species are also reported for New Mexico (1) (13). [No. 253/82]

Eriogonum rotundifolium Benth. (Polygonaceae). Root used as medicine, leaves for sore throat. The stems are eaten.

Wyman reports (16) that the Navaho use this plant as an emetic in gastric disorders or genito-urinary conditions which are attributed to the swallowing of a red ant. The plant is also used for fuel and the construction of shelters, and it serves as a winter browse. [No. 253/83]

Eriogonum species (probably). Used during confinement after childbirth.

Three species of this genus have been reported used as food in the Indians; many other species are browsed. Vestal (25) speaks of Navaho use of the whole plant of E. leptocephalum to hasten delivery of placenta and reduce postpartum pains. [No. 253/74]

5. Dr. Dutton suggests that the penciled notation might refer to the flower of Gilia, many species of which grow in this area. (Cf. discussion of Gilia in second alphabetical listing of this article.)

Euphorbia lata Engelm. (Euphorbiaceae). (Identity confirmed by Dr. E. F. Castetter.) Used for "upset stomach," a rather indefinite entity.

E. montana Engelm. has been reported used in admixture as a purge (16), and E. fendleri T. & G. in infusion for stomach ache (39). [No. 253/73]


The Navaho used the leaves chewed and applied to sores (25) and the plant as an emetic (2) and to allay hemoptysis (16). Kearney and Peebles (3) reported (fide Mrs. Collum) that the Indians of Arizona applied the root to burns and treated levers with a decoction of the leaves. Winters, sheep forage the plant (16). [No. 253/78]

Franseria temuifolia Harv. & Gray (Compositae; confirmed as probably correct by Dr. E. F. Castetter.) Bur-sage. A little bit of the herb is used mixed in tobacco.

This and other F. species are used by the Navaho to facilitate delivery of the placenta in childbirth (9). The roots and leaves are eaten by the Papago (10). [No. 253/71]

Gutierrezia lucida Greene (probably) (Compositae). Snakeweed. Plant is applied to the back and legs of horses; purpose not stated. [No. 253/90]


The last-named species is said to have been used by the Navaho for expediting childbirth, especially delivery of after-birth; the herb was also used as an emetic and in treating red ant and snake bite and bee and wasp sting by local application (9) (16). The ashes were reported used externally for headache (16). Species of the genus are called "broom weed" in parts of New Mexico, where the Spanish-speaking people use the plant to sweep their houses (5). (The name "brownweed" (16) is probably a corruption.) Medicinal uses have been reported for the Tewa Indians (13). [No. 253/86]

Haplopappus (Apolopappus) spinosus (Pursh) DC. subsp. tephros Hall (Eriocarpuim wootoni Greene: Sideranthus wootoni
Mesa Daisy, Devil Plant (in Navaho). This plant or some part of it is used for headache.

The Navaho use this species in toothache (2) and members of the genus are comminuted and used as a medicinal snuff in rhinitis etc. (4) (16). In New Mexico, this species is applied, powdered with salt, to the treatment of abscesses or "swellings" of the face and neck (1). In northern Mexico, where the plant is called yerba de vibora it is used in gastric and uterine disorders, and as a "blood purifier" (Coahuila) (6). [No. 2-53/61.]

*Helianthus annuus* L. (Compositae). Sunflower. The seeds (popularly "seeds") are eaten and are thought to give appetite. The plants are probably growing wild as escapes from cultivation.

The Navaho, it is said (2), burn powdered sunflower pith directly above warts to remove them: this appears to be a form of moxibustion. The seeds are also used to make dyestuffs. Mrs. Curtin details a number of uses by Indians and Spanish-Americans in New Mexico (1). [No. 2-53/68.]

*Juniperus osteosperma* (Torr.) Little. (Possibly *J. utahensis* [Engelm.] Lemmon) (Pinaceae). The seeds (fruit probably intended) are consumed for headache: some part of the plant (unspecified) is used to wash the hair.

The Navaho were previously known to use the fruit in influenza and various parts of the plant in many religious medicinal observances, etc. (16). Various species are reported used medicinally by the Hopi Indians and others (1) (3). [No. 2-53/69.]

*Kochia trichophylla* Stapf (Chenopodiaceae). Used for sores. The medicine men use this for painting a patient during a healing ceremony.

Like almost all herbaceous plants of this general area, this is a sheep forage plant, especially valuable in winter (Aven Nelson). The species is native to Asia, and in this country has escaped from cultivation. [No. 2-53/94.]

*Lactuca virosa* L. (Compositae). Wild Lettuce. The plant is used for "sick stomach" (no doubt meaning gastroenteritis—nausea, vomiting, and diarrhea).

Some *Lactuca* species have been employed by the Navaho in treating snake-bite (8). [No. 2-53/99.]

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*Lappula texana* (Scheele) Britton (Boraginaceae). Stick Seed. Some part or parts of the plant are used at confinement and for nosebleed.

As with most of the items of this catalogue, the uses cited could not be found recorded in the literature. [No. 2-53/84.]

*Lepidium lasiocarpum* Nuttall ( Cruciferae). Pepper Grass. Used as a "disinfectant"—possibly the smoke is intended.

Around Tularosa, a species of *Lepidium* is mixed with lime and applied to the wounds of animals (1). [No. 2-53/76.]


The Navaho, Zuñi, Hopi, and other Indians of New Mexico and of northern Arizona relish these berries, eaten alone (raw or cooked) or as a sauce to other foods (1) (3) (15) (16). [No. 2-53/85.]


The Navaho are reported to use this species for headache (25) and for "general aches and pains" (2). Robbins et al. (13) reported *M. menthaefolia* Graham used for headache among the Tewa, also for fever in sore throat, Castetter (12) reports the leaves in use by New Mexico Indians for seasoning. Several species are used in domestic medicine in Arizona (3) and New Mexico (16). [No. 2-53/86.]

*Muhlenbergia (Muehlenbergia) dubia* Fourn. (Gramineae). "(Pine) Muhly." Root ground up and mixed with sheep's fat, ground corn, and blood to make sheep's blood cake. (Identification made by Mr. E. R. Sohns, U.S. Natl. Herb.).

The Navaho are known also to use *M. species in making brooms and brushes* (16). [No. 2-53/95.]

*Orobanchis* species (Orobanchaceae). Broom Rape. Plant used for infections.

O. fasciculata Nuttall is applied to wounds and open sores by the Navaho (3) (16). Various species are used by the same tribe in the form of a decoction for ulcers (3). The plants are eaten by some southwestern Indians (3). [No. 2-53/103.]
Oryzopsis hymenoides (Roem. & Schult.) Ricker (Gramineae) Mountain Rice. Silk Grass. (Indian) Rice Grass. The ground seeds are eaten.

This is a well-known food. The plant also serves usefully as forage and fodder for both wild and domesticated animals. [No. 2-53/79.]

*Petaloasterum* (Petaloasteron) purpureum (Vent.) Rydb., probably (Leguminosae). Prairie Clover. Used for pneumonia; "important to Navaho."

It is known that this and other *P.* species are used medicinally by the Navaho and other aborigines of New Mexico (1) (2) (16), in the Great Plains area, a beverage tea is brewed from the leaves. [No. 2-53/100.]

Physalis lanceolata Michaux (Solanaceae). (Prairie) Ground Cherry. The berries are eaten. Corolla and spherical fruit are yellow.

Many Indian groups eat the fruit, fresh or dried (3), and there is some medicinal usage for at least one *Physalis* species (1). [No. 2-53/88.]

Plantago parishii Roem. & Schultes (Plantaginaceae). Indian Wheat. The broth (from the seeds?) is administered to babies when "they spoil" (?), probably meaning when they are distressed because of colic or constipation.

Seeds of this species and of *P. fastigiata* Morris and others are called "Indian wheat" and are said to be used as pyriform seed substitutes (3) in digestive disorders. [No. 2-53/92.]

Portulaca retusa Engelm. (Portulacaceae). The plants are eaten, used as pot herbs by the Indians (15) and mush and bread are made from the seeds (16); (cf. "pulsey", *P. oleracea* L.). [No. 2-53/98.]

*Pubes tridentata* (Pursh) DC. (Kunzia tridentata [Pursh] Spreng.) (Rosaceae). Antelope Bush. Brush. Taken during confinement. The bark is used for diapers. "Small—some." (This cryptic statement may mean that some shrubs or some plant parts, such as flowers, were small in size.)

This species is an important browse plant. According to Vestal

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29. the root has been used to facilitate expulsion of afterbirth. [No. 2-53/81.]

Ribes inermis Rydberg (Grossularia inermis [Ryd.] Cov. & Brit.) (Saxifragaceae). (White Stem) Gooseberry. The berries are eaten in winter.

Indians of the west use the fruit both fresh and dried as a food [No. 2-53/93.]

Rumex crispus L. (Polygonaceae) Curly Leaf Dock. Used for "faint" (fainting? faintness?).

The root is applied to sores by the Navaho (2) (29). The plant was reputedly medicinal, and was used as a potherb in Arizona (9) and New Mexico (12). Under the vernacular name *lengua de vaca* (cow's tongue), it has been used medicinally in New Mexico; for instance, the leaves are bound to the head for headache, and the roots are chewed for "pyorrhea." The roots have also served to treat diarrhea (1) [No. 2-53/87.]

Salix exigua Nutt. or its variety (Salicaceae). (Coyote) Willow.

Sandbar Willow. The leaves (?) were used to prepare a drink "like orange juice." (The specific determination could not positively be made from the specimen.)

The leaves and bark have furnished food to both wild and domesticated animals. A number of medicinal usages in New Mexico have been cited for the species (1), but among the Navaho the plant is mainly used in various religious-medicinal ceremonies. (16) (29). [No. 2-53/65.]

Salvia kali L. var. tenuifolia Tausch (S. pestifer A. Nels.) (Chenopodiaceae.) Russian Thistle. Salt-wort. Seeds are roasted and eaten.

This plant originated from Eurasia, but now is one of the best known plants of the western United States—the commonest of the "tumbleweeds." The plant serves as forage and fodder, and parts have been used in the preparation of dyestuffs (8) and medicines (22). [No. 2-53/62.]

Sarcobatus vermiculatus (Hook.) Torr. (Chenopodiaceae.) Greasewood. The "seeds" (actually fruits) are eaten.

The plant is browsed (but to sheep is sometimes toxic); used as a fuel in the kiva (3) and elsewhere; chewed and applied to the stings of hymenopterous insects; and used in many other ways (16) (29). [No. 2-53/66.]
Senecio species, possibly *S. multicuspidatus* Greenm. (Compositae), are sometimes used in New Mexico materia medica (1) to enhance the voice in Navajo chanting ceremonies (23).

Some species are used in the New Mexico materia medica (1) to enhance the voice in Navajo chanting ceremonies (23).

Shepherdia argentea (Pursh) Nutt. (Elaeagnaceae). Silver Buffalo berry. The berries are administered in fever.

The popular Indian usage of the fruit as a food (fresh and dried) throughout the western states and Canada is well known. The foods prepared from a sister species, *S. canadensis* (L.) Nutt., by the Indians of British Columbia have been described (7). [No. 2:53/16a.]

*Tetradymia canescens* DC. (Compositae). Horse brush. Used for inducing (?) menstruation by putting plant in (warm or hot) water and taking (sitz) bath in the infusion.

This is one of the many species of plant used by the Navaho as an emetic (2), although the application seems to have been intended for various gastro-intestinal disorders. The Hopi Indians in Arizona applied the leaves and roots as a tonic and in uterine troubles (3). [No. 2:53/8a.]

_Townsendia incana_ Nuttall (probably) (Compositae). Used in labor to facilitate delivery of the baby.

It has previously been reported that the Navaho used _Townsendia_ species at parturition to aid in passage of the child and placenta (2) (23). They also use it as a snuff for nasal congestion and otherwise medicinally (16). [No. 2:53/96.]

_Trugopogon porrigifolius_ L. (Compositae). Oyster plant. This is claimed to be a "milk plant," the latex being "used as milk."

This statement appears to rest on exaggeration or misunderstanding. The coagulated latex has been used as a masticatory by British Columbia Indians (13), and hence is probably not toxic. [No. 2:53/63.]

_Verbesina thapsus_ L. (Scrophulariaceae).—Mullein. The plants are "lighted and smoked for worms in sheep's nose."

While this specific use could not be found in the literature studied, this plant has long been known as a luminary. The leaves

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and flowers are dried and smoked in combination with _Macromeria gubeli_ (A. Gray) Mackenz. for mental disturbances (Arizona) (5); the plant is much used, smoked, orally administered, etc., in asthma, bronchitis, etc., in New Mexico (1). [No. 2:53/91.]

Aside from the forty-five specimens above discussed, there were two which were included in Mrs. Josey's 1941 collection of dye-stuffs, which are as follows:

_Artemisia tridentata_ Nuttall (Compositae) Common (or Black) Sage (Brush). Chamise Hododendo. No use was mentioned on the specimen label, but in notes accompanying these materials was found a dye-stuff formula. 6

The dominant species over large areas of several states from British Columbia province of Canada to northern New Mexico, this plant was considerably used by the Indians and early settlers for its supposed medicinal effect, as in influenza, colds, fevers, rheumatism, hemorrhage, etc. (1). The Tewa Indians use the leaves of this and other _A_. species for indigestion, especially with flatulence, and as an expectorant (15). The Navaho use it similarly, also to relieve headache, and to aid delivery (16). A United States patent recently issued claimed use of the volatile oil emulsion for treating gingivitis and as a cosmetic application to the skin (17). [No. 2:53/116a.]

_Rumex altilissimus_ Wood (Polygonaceae). _Tsa saf ka china_ (Navaho); Yebitchai probably refers to use in Yebichei or nine-days_HEADER chant ceremonies. [No. 2:53/117a.]

In 1940, Dr. Dutton was working with an old Navaho singer, or medicine man, Kim a'ani Nez, from the region north of Ft. Defiance and Sawmill, Arizona. He was in need of some "blue medi- 6. "Sagebrush and Indigo (green color): 4 gallons of sagebrush dyewriter; 9 spoons of indigo blue; ½ lb. yarn; 1 tablespoonful of raw alum. To secure a green, add enough indigo to the dye bath of sagebrush. Dye yarn with sagebrush first—this produces a light yellow color. Re-dye by adding blue indigo to sagebrush dyebath. Bring to a boil, add the raw alum, stir well, and add wet yarn. Boil 2 hours; rinse." (This formula is not given in Bryan [8]).

7. Dr. Dutton notes that _Rumex_ species, such as _R. hymenostegus_, known locally as cahage, dock, or wild rhubarb, are included in the "family" of the Life Medicine plants (6) of the Navaho. The dried root is ground and used on sores, as it has a drying effect.

_Tsa saf_, or _Tzag_, is equivalent to Navaho Kachina. As personifer of the Fringed Mouth God, he may take part in the Night Way ceremonial, or Yebichei.
iciné," and knew of only one place where it could be obtained. Accordingly, Dr. Dutton followed the old man’s directions. In a location south of Gallup, New Mexico, on the way to Zuñi, there they dug up roots of the plant which the singer indicated. When they were first dug, Dr. Dutton reports, the roots had a distinct blue color: and the singer said that the roots get blue when put into water. The Navaho name for the plant is aze’dal’fish, which is identifiable as Ditaxis cyanaphylla Woot. & Standl. It is one of the Life Medicine plants, used specifically for the Life Way chants [8].

Species Reported by Botanical Name without Specimens.

The following additional species are stated on the authority of Mrs. Verda Joeoy to be found in the Chaco Canyon region, and to be used by the Navaho Indians there for food, medicine, in ceremonies, and so on. The collection was made by a ranger working with the National Park Service.

Abronia fragans Nutall (Nyctaginaceae). Sand Verbena. This with other Abronia species has been reported used by the Navaho to treat boils, the bite of a certain species of black beetle (9), and the poison of spiders (16), and otherwise (23). The roots have been used as human food (14).

Artemisia tridentata Nutt. var. trifida Nutt., A. tripartita Rydb. Black Sagebrush. The Navaho used this in their religious-medicine ceremonies; also for treating corns (16). The fruit (“seeds”) have been bruised for pinole (meal) in California (Barrows, 1900). A. tridentata Nutt. var. angustifolia P. Watson: a synonym for either subspecies typica or linearis. (Cf. supra).

Bouteloua hirsuta Lag. (Chondrurus foenueum Torr.; C. hirtus)

8. With the exception of Castilleja integra, all data in this section on specific uses were obtained from various reference works.
The Navaho also have used it as a dye plant, "signal plant" (8), and in various other ways (16). The plant serves for deer and livestock forage.

_Datura meteloides_ DC. (Solanaceae). Thorn Apple. Sacred Datura. The leaf infusion is applied by the Navaho to wounds after castration of sheep; the seeds are used internally in ceremonies (16), also by some tribes in Arizona as a delirificant and in their medicine, thus for instance to prevent miscarriages (3). The Zuñi, Yuman, and Hopi tribes are reported to use the plant medicinally (15).

_Echinocereus coccineus_ Engel. (Cactaceae). Cereus. Hedgehog Cactus. The fruit are juicy and edible (12), although sometimes in this species are regarded by the Navaho as poisonous (16); used as a heart stimulant by the Navaho (16).

_Encelia species_ (Compositae). Brittle Bush. _Encelia farinosa_ Gray exudes a "gum" used as a masticatory (12).

_Ephedra trifurca_ Torr. Joint Fir. Mexican Tea. The Navaho use the dried plant to treat genito-urinary diseases, gastric disorder, also in making a reddish dye (16).

_Erigeron concinnus_ (H. & A.) T. & G. (Composite). Fleabane. Uses by the Ramah Navaho are given in Vestal (23). It has been reported that _E. divergens_ T. & G. was used by Navaho in religious medicine ceremonies and in facilitating childbirth (16).

_Eriogonum alatum_ Torr. and other _E._ species. (Polygonaceae). Winged Eriogonum. The large root of _E. alatum_ is eaten by the Navaho, is used as a mild analgesic, and is an important medical plant (16) (3). (Compare Vestal [23]) Various species are used in Navaho medicine for sore throat and diarrhea (2). _E. Jamesi_ Benth. is used orally by the Navaho of both sexes as a contraceptive, the root infusion being drunk (2) (29).

_Euphorbia montana_ Engel. Goliathina. This plant has been used by the Navaho for boils and pustules, for a beverage during parturition, and as a purge (16).

_Gilia species_ (Polemoniaceae). Several species have been used by the Navaho for indigestion (especially in gastric disturbances) and as an emetic and purge (16). Such a species is _G. attenuata_ (A. Gray) A. Nels. (Sky Rocket), which is also a browse plant and a cultivated ornamental flower. Some _Gilia_ species have also been used to aid in delivery of the placenta (9). The Tewa used leaves and flowers of _G. longiflora_ (Torr.) G. Don for headache, applied to sores, etc. (19) (23).

_Juniperus monosperma_ Sarg. Cherry Stone Juniper. The gallules are reported eaten and used for seasoning (12); the Navaho sometimes chew the inner bark (16), but the plant is important to these peoples mostly in their religious-medicinal ceremonial (16) (23). Numerous medicinal uses by the Tewa are reported by Robbins et al. (15).

_Lithospermum incisum_ Lehnn. (Boraginaceae). Gymnema. Puccoon. This genus has been of considerable interest in recent years following reports of use by some aborigines as an oral contraceptive. The Navaho chew the species _angustifolium_ Michx., in coughs and colds. The cooked roots were reportedly used for food by the Thompson Indians (19).

_Mentzelia albicaulis_ Doug. ex Hook. (Loasaceae). White-stem Blazing Star. A parched meal is reported made from the seeds by the Navaho Indians (16); there are also Navaho medicinal uses (23).

_M. multiflora_ (Nutt.) A. Gray, Stickleaf. Used by the Navaho as an emetic and like the preceding as a food (16) (23).

_Mirabilis multiflora_ A. Gray (Quamoclit _multiflorus_ Torr.) (Nyctaginaceae). Four O’Clock. The plant was used by the Navaho for various mouth disorders, and to treat rheumatism and "swellings" (23). The Hopi Indians were said to use the powdered root in gastralgia and to eat the root for its delirificant effects (3).

_Muhlenbergia cuspidata_ (Torr.) Rydb. (Gramineae). "Muhly." The Navaho use the stems and leaves to make hairbrushes and brooms (16).

_Opuntia species_ (Cactaceae). Prickly Pear. As is well known, the ripe fruit are juicy and succulent (12), or they may be eaten after boiling (15) or sun-drying (16). The Navaho use some species for boils (2). Several other Navaho uses are reported by Wyman (16) and Vestal (23).

_Parthenocissus quinquefolia_ (L.) Planchon (Ampelopsis _quinquefolia_ Michx.) (Vitaceae). American Ivy. The stems and fruits have been reported eaten by the Amerindians. Wyman (16) reports a medicinal Navaho use.
P. 

P. 

Phlox

Flax

P. douglasii Hook. var. diffusa A. Gray

P. douglasii Hooker. This is used in Navaho medicine ceremonies (16).

Pseudradendron juniperinum Engelm. (Loranthaceae). Mistletoe. This species is used by the Navaho for treating warts (2), and is also used in the Hopi (3) and Tewa (15) medicine. The Navaho eat the fruit and at least formerly drank a tea from the stems (16).

P. ligatum Trelease. This species, growing on juniper trees, is considered by some taxonomists identical with the preceding species. In any case, it is used like the preceding.

Pistus edulis Engelm. (Pinaceae). Nut Pine. The resin is used by the Navaho as an emetic (2), otherwise to waterproof containers, cement turquoise in jewelry, etc. The seeds provide food and represent a commercial crop, since large amounts are sold, especially in the eastern cities. Many uses are cited by Vestal (23).

Polopus wislizeni (S. Wats.) Ser. (P. fremontii S. Wats. var. wislizeni S. Wats.) (Salicaceae). Poplar. Wislizenius Cottonwood Alamo. The catkins are reported eaten raw by some of the Pueblo Indians of New Mexico (12) or chewed like gum (16). The Tewa use the tree in a number of practical ways (15).

Rhus triobata Nutt. (R. conadenus Marsh var. triobata Gray Schmalzia [Schmalzia] triobata [Nutt.] Small) (Anacardiaceae). Sumac. Berries are reported eaten by the Indians, the juice used as a beverage, and the extract as a dye mordant (12); several other uses are known among the Navaho (16) (23).

Ribes inerbrius Lindl. (R. punnum Nutt.) Curran. It is said that although they may be made sick, the Hopi (3) and Navaho (16) eat the fruits (3); the leaves are also eaten with fat (12). The wood is probably used like the preceding.

Ranunculus species (Scrophulariaceae). Beard Tongue. Various species have been used by the Navaho as cathartics, diuretics (P. toreyi Benth.). In the treatment of childbirth, for burns, and toothache (2) (16) (28). P. toreyi has been used by the Tewa as dressing for sores (15). Species are occasionally browsed and used to prepare beverages.

Sesamum officinale (L.) Scop. (Sesamum officinale L.) var. leucopyrum DC. (Cruciferae). Hedge Mustard. A weed introduced from Europe; the parched seeds are used to make soups, stews, etc. (12) (16), and the plant is foraged (16).

Solanum fendleri A. Gray (S. tuberosum L. var. boreale A. Gray) (Solanaceae). Nightshade. Wild Potato. This plant is very similar to "Irish" potato. The tubers are eaten raw with clay, it is said (12), and the latter probably to relieve gastric distress from hyperacidity.

Sphaeralcea angustifolia (Cav.) G. Don var. lobata (Wooton) Kearney (S. lobata Wooton) (Malvaceae). Globe Mallow. The Tewa apply the powdered roots to snakebite wounds and sores (15). Related species were used by the Navaho for colds, coughs, influenza, etc. (2). The Hopi use some species for gastrointestinal disorders; the mucilaginous stems are chewed (12); a preparation is used in eye diseases (4).

Sporobolus cryptandrus (Torr.) A. Gray (Gramineae).—Poverty Grass. Sand Dropseed. This grass, widely distributed over the western states from Canada to Mexico, is foraged. The seeds of some species are used by the Navaho for food (15), as in tortillas and dumplings, and for medicine (23).

Tamarix gallica L. (Tamaricaceae). (French) Tamarisk. Salt Cedar. This Eurasian tree has been planted out in recent years by the Soil Erosion Service; it furnishes shade and nectar. It is perhaps still too early for the plant to have received much empirical trial and usage by the native peoples, especially in these modern days.

Tribulus terrestris L. (Zygophyllaceae). Caltrop. Puncture Vine. This plant naturalized from Europe and Asia has sometimes been used in Indian domestic medicine. It serves in the traditional ceremonial medicine of the Navaho (16).
Xanthium canadense Mill. (X. strumarium L. var. canadense T. & G.) (Compositae). Bur Dock. The bur or fruit of X. canadense is used by the Navaho in local applications to decoctise perspiration (16). The bur of X. italicium Miers etti has been used in New Mexico as a food (12) and in ceremonial (29). The seeds of some species are applied as styptic (3) and otherwise medicinally (15).

Yucca glauca Nutt. (Y. angustifolia Pursh) (Liliaceae). Giant Plains Yucca. Pamilla. Species of the genus including this one have been widely used by the Indians—as a source of food (stems, buds, flowers, peduncles, fruits (seed pods), seeds) (12); as medicine (root as delirificant and laxative); as detergent; as fiber (stem and leaves); and otherwise (3) (29). The Navaho use Y. glauca roots in a hair shampoo (16). Several Tewa uses are noted by Robbins and co-authors (15).

Summary

1. From a study of a collection of forty-seven specimens made in the Chaco Canyon area of New Mexico, plant usages for thirty-seven species are reported which apparently have not previously been entered in the record. Usage statements for the other ten species confirm the findings of others. Some of the plants represent well known economic species, others apparently have been considered as of no direct utility. A few newly recorded common names and other new data also appear.

2. A compilation from the literature has been prepared of comparative data on the ethnobotany of an additional forty-eight plant genera and species reported found and used in the Chaco Canyon area.

References

(1) Mrs. L. S. M. Curtin, Healing Herbs of the Upper Rio Grande, Laboratory of Anthropology, Santa Fe, N. M. (1947); various pp.
(2) Leland C. Wyman and Stuart K. Harris, "Navajo Indian Medical Ethnobotany," Univ. of New Mexico Bull. 396 (1941).
(5) Mark L. Terry, Jr. (Hatch, N. M.), informant.
(9) E. U. Wooton and Paul C. Standley, "Flora of New Mexico," Univ. of New Mexico, v. 19 (1945) (see index).
(12) E. F. Castetter, "Un cultivated Native Plants Used as Sources of Food," Univ. of New Mexico Bull. 266 (1935).
(16) Francis H. Elmore, "Ethnobotany of the Navajo," Univ. of New Mexico Bull. 502 (1944) (see index).
(22) Clarence G. Salsbury, M. D. (Commissioner, Arizona State Dept. of Health, Phoenix, Arizona) et al. (preliminary publication in press).
(24) E. L. Hewett and Bertha F. Dutton, The Pueblo Indian World (Univ. of New Mexico Press, 1945).