ADDITIONAL NOTES ON THE GENUS VERBENA. XIV

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VERBENA OFFICINALIS L.

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Coon (1963) tells us also that "Pliny said 'if the dining chamber be sprinkled in water in which the herb Verbena has been steeped, the guests will be merrier'. Such a story led to a belief in its efficacy as a cure against the plague, and as a remedy for almost anything. It even had supposed supernatural powers. Several Welsh names have meanings such as 'devil's hate' and 'enchantment herb'."

Fior (1969) reports that "Gli antichi attribuirono a questa p. proprietà meravigliose, la impiegarono per pulire gli altari prima dei sacrifici e par intessere corone agli eroi ai poeti." He affirms that the name "verbena" was used by Virgil, which is correct.

Bertolini (1844), as is to be expected, concentrates on the Roman history of the plant: "Olim laudata apud medicos ob vim adstringentem, vulnerariam, nunc exoleta. Veteres superstitiose Verbenas adhibebant: 'Siquidem auctores imperii Romani, conditoresque immensum quiddam et hinc sumpsere, quoniam non aliunde sagmina in remediis publicis fuere, et in sacris, legationibusque Verbenae. Certe utroque nomine idem significatur, hoc est gramen ex arce cum sua terra evulsam, ac semper et legati cum ad hostes, clarigatumque mitterentur, idest res raptas clare repetitum, unus utique Verbenarius vocabatur.' Plin. Nat. hist. lib. 22, cap. 2. [58--79 A.D.] Pari ratione utebantur Verbenis in sacris magicis:

"Effer aquam, et molli cinge haec altaria vitta,
Verbenasque adole pingues, et mascula thura
Virg. Eccl. 8. v. 64.65 [37 B.C.]

Sacerdotes eisdem coronabantur:

".....alii fontem, ignemque ferebant
Velati lino, et verbena tempore cincti
Virg. AEneid. lib. 12, v. 119.120 [19 B.C.]

Imprimis vero aediculae compitales verbenis ornabantur:

"Flore sacella tego, verbenis compita velo,
Et crepat ad veteres herba sabina focos
Prop. Eleg. lib. 4. eleg. 3. v. 57.58." [26 B.C.]

Folkard (1884) gives another full account of this fascinating plant's history, saying "The Vervain, or Verbena, has from time immemorial been the symbol of enchantment, and the most ancient nations employed this plant in their divinations, sacrificial and other rites, and in incantations. It bore the names of Tears of Isis, Tears of Juno, Mercury's Blood, Persephonion, Demetria, and Cerealis. The Magi of the ancient Elamites or Persians made great use of the Vervain in the worship of the Sun, always carrying branches of it in their hands when they approached the altar. The

magicians also employed the mystic herb in their pretended divinations, and affirmed that, by smearing the body over with the juice of this plant, the person would obtain whatever he set his heart upon, and be able to reconcile the most inveterate enemies, make friends with whom he pleased, and gain the affection, and cure the disease of whom he listed. When they cut Vervain, it was always at a time when both the sun and moon were invisible, and they poured honey and honeycomb on the earth, as an atonement for robbing it of so precious a herb. -- The Greeks called it the Sacred Herb, and it was with this plant only that they cleansed the festival-table of Jupiter before any great solemnity took place; and hence, according to Pliny, the name of Verbena is derived. It was, also, one of the plants which was dedicated to Venus. Venus Victrix wore a crown of Myrtle interwoven with Vervain. -- With the Romans, the Vervain was a plant of good omen, and considered strictly sacred: --

'Bring your garlands, and with reverence place
The Vervain on the altar.'

They employed it in their religious rites, swept their temples and cleansed their altars with it, and sprinkled holy water with its branches. They also purified their houses with it, to keep off evil spirits; and in order to make themselves invulnerable, they carried about their persons a blade of Grass and some Vervain. Their ambassadors, or heralds-at-arms, wore crowns of Vervain when they went to offer terms of reconciliation, or to give defiance to their enemies, a custom thus noted by Drayton: --

'A wreath of Vervain heralds wear,
Amongst our garlands named;
Being sent that dreadful news to bear,
Offensive war proclaimed.'

Virgil mentions Vervain as one of the charms used by an enchantress: --

'Bring running water, bind those altars round
With fillets, and with Vervain strew the ground.'

The Druids, both in Gaul and in Britain, regarded the Vervain with the same veneration as the Hindus do the Kusa or Tulasi, and, like the Magi of the East, they offered sacrifices to the earth before they cut this plant. This ceremony took place in Spring, at about the rising of the Great Dog Star, but so that neither sun nor moon would be at that time above the earth to see the sacred herb cut. It was to be dug up with an iron instrument, and to be waved aloft in the air, the left hand only being used. It was also ordained by the Druidical priests, for those who collected it, 'that before they take up the herb, they bestow upon the ground where it groweth honey with the combs, in token of satisfaction and amends for the wrong and violence done in depriving her of so holy a herb. The leaves, stalks, and flowers were dried separately in the shade, and were used for the bites of serpents infused in wine. Another account states that the Druidesses held Vervain in as great veneration as the Druids did the Mistletoe. They were never permitted to touch it. It was to be gathered at midnight, at the full of the moon, in this manner: -- a long string with a loop in

it was thrown over the Vervain-plant, and the other end fastened to the left great toe of a young virgin, who was then to drag at it till she had uprooted it. The eldest Druidess then received it in a cloth, and carried it home, to use it for medicinal purposes and offerings to their gods. In the Druidic procession, to the gathering of the Mistletoe, the white-clad herald carried a branch of Vervain in his hand, encircled by two serpents. The priests, when performing their daily functions of feeding the never-dying fires in the Druidic temples, prayed for the space of an hour, holding branches of Vervain in their hands. Pliny tells us that the Druids made use of it in casting lots, as well as in drawing omens and in other pretended magical arts; he also says that if the hall or dining chamber be sprinkled with water wherein Vervain lay steeped, all that sat at the table should be 'very pleasant and make merry more jocundly'.

'Lift up your boughs of Vervain blue,
Dipt in cold September dew;
And dash the moisture, chaste and clear,
O'er the ground and through the air.' -- Mason

"In mediaeval days, the sacred character of Vervain was still maintained, and the plant was greatly prized, and used in compounding charms and love-philtres. Known in our country as Holy Herb and Simpler's Joy, it was credited with great medicinal virtues.

'Black melancholy rusts, that fed despair
Through wounds' long rage, with sprinkled Vervain cleared.'
Davenant.

Its juice was given as a cure for the plague, and the plant was prescribed as a remedy in some thirty different maladies, and was suspended round the neck as an amulet. Gerarde, however, tells us that 'the devil did reveal it as a secret and divine medicine'; and R. Turner writes (1687): -- 'It is said to be used by witches to do mischief, and so may all other herbs if by wicked astrologers used to accomplish their wretched ends'. But notwithstanding that it was used by witches and wizards in their incantations and spells, and was in fact called the Enchanter's Plant, Vervain was considered to possess the power of combating witches; thus Aubrey says: --

'.....Vervain and Dill
Hinder witches from their will.'

and Michael Drayton writes: --

'Here holy Vervayne, and here Dill,
'Gainst witchcraft much avayling.'

and again --

'The Nightshade strews to work him ill,
Therewith the Vervain and the Dill
That hindreth witches of their will.'

On the Even of St. John (June 23rd), Vervain was for a long time associated with the observances of Midsummer Eve. Thus we read in 'Ye Popish Kingdome': --

'Then doth ye joyfull feast of John ye Baptist take his turne

When bonfires great with loftie flame in every towne doe burne,
And young men round about with maides doe dance in every streete,
With garlands wrought of Mother-wort, or else with Vervain sweete.'

J. White, Minister of God's Word, writes in 1624: -- 'Many also use to weare Vervein against blasts; and when they gather it for this purpose firste they crosse the herb with their hand, and then they blesse it thus: --

'Hallowed be thou, Vervein,
As thou growest on the ground,
For on the Mount of Calvary
There thou wast first found
Thou healedst our Saviour Jesus Christ,
And staunchedst his bleeding wound,
In the name of the Father, the Son, and the Holy Ghost,
I take thee from the ground.'

In many rural districts, Vervain is still regarded as a plant possessing magical virtues as a love philtre. It has the reputation of securing affection from those who take it to those who administer it. The gun-flint boiled in Vervain and Rue ensures the shot taking effect. The root of Vervain tied with a white satin ribbon round the neck acts as a charm against ague. Vervain and baked toads, worn in silken bags around the neck, are a cure for the evil. -- In the northern provinces of France, the peasants still continue to gather Vervain under the different phases of the moon, using certain mysterious ejaculations known only to themselves whilst in the act of collecting the mystic herb, by whose assistant they hope to effect cures, and charm both the flocks and the rustic beauties of the village. -- The Germans present a hat of Vervain to the newly-married bride, as though placing her under the protection of Venus Victrix, the patroness of the plant. -- Gerarde tells us that in his time it was called 'Holie Herbe, Juno's Teares, Mercurie's Moist Blood, and Pigeon's Grass, or Columbine, because pigeons are delighted to be amongst it, as also to eate thereof.' -- Astrologers place Vervain under the dominion of Venus."

This same exhaustive researcher in the field of folklore and botanical history tells us that the bridal wreaths of the Romans were usually composed of vervain plucked by the bride herself. In Brittany the vervain is known as "herb-of-the-cross". The populace of Madrid was long accustomed, on St. John's Eve, to wander about the fields in search of vervain, from a superstitious notion that this plant possesses preternatural powers when gathered at 12 o'clock on St. John's Eve. "The divining Gall-apple of the Oak, the mystic Mistletoe, the Savin, the Moonwort, the Vervain, and the St. John's Wort are considered magical, and therefore form part of the witches' pharmacopoeia -- to be produced as occasion may require, and their juices infused in the hell-broths, philtres, potions, and baleful draughts prepared for their enemies. -- Vervain and St. John's Wort, carried about the person, will prove a sure preservation against the wiles of Satan and the

machinations and sorcery of witches:

'Gin you would be leman of mine
Lay aside the St. John's Wort and the Vervain.'

The Mistletoe, in addition to its miraculous medicinal virtues, possesses the power of opening all locks; and a similar property is by some ascribed to Artemisia, the Mandrake, and the Vervain."

Benchley (1970) says "Supposedly sophisticated Europeans still splash themselves with exotic oils and drink doses of vervain" as an aphrodisiac.

Lonicer (1679) speaks in old German of the medicinal virtues of Verbena officinalis in his time: "Seyn gut zu den feuchten oder fliessenden Wunden / oder alten Schäden. Die Wurtzeln seyn gut / mit Wein getruncken / für die Geelsucht. Eisenkraut heilet allerley innerliche Gebrechen / als die verstopffte Leber / Miltz und Nieren / in Wein gesotten / und darüber getruncken. Es hilfft auch also getruncken / für das schwere Athemen / oder Keichen. Eisenkraut gestossen /als ein Pflaster auf die Wunden gelegt / heilet und trücknet sie geschwind. Eisenkraut safft mit Wein getruncken / benimmt des Gifft im Leib. Die Blätter und Wurtzel in Wein gelegt /den Wein getruncken /benimmt das viertägige Fieber. Etliche meinen /zum dreytägigen Fieber soll man nemmen drey Blätter / und zum viertägigen vier Blätter und vier Wurtzeln. Die Blätter ein Quintlin in Wein gethan /den also vier Tag lassen stehen / und darnach im Mund gehalten / heilet die Geschwer darinn. Eisenkraut mit Wasser gesotten / und genützt /reiniget den Frauen ihre Mutter / und bringt ihnen ihre Zeit. Oder siede das Kraut samt der Wurtzel in Wein / und trincks. Der Saame mit Fenchelsafft vermischt / und in die Augen gelassen / reiniget sie und machet klar Gesicht. Eisenkraut ist gut zur Leber / und zum erhabenen und geschwollenen Miltz / wie gleichfalls zur siechen Lungen. Eisenkraut mit samt der Wurtzel gestossen /darvon getruncken /oder die Wurtzel pulverisiert und getruncken /vertreibt den Stein. Die Blätter von Eisenkraut in Essig genetzt oder gestossen /und übers heilig Feuer gelegt /kühlet und löschet den Brand.....Das Kraut und Wurtzel in Wein gesotten /den Mund damit gespület oder geschwencket /ist gur für das effen und faule Zahlfleisch. Eisenkraut mit Honig vermischt /zeucht die Wunden zusammen. Das Kraut mit altem schweinen Schmaltz zerstossen /und übergelegt /leget nider der Frauen Geschwulst an heimlichen Orten /zusamt den Schmertzen.....Eisenkraut soll um S. Johanns Tag / mit aller Substantz gehackt und gebrannt werden. Eisenkrautwasser Morgens und Abends / jedesmal drey Loth / sechs oder acht Tag nacheinander getruncken / vertreibt die Geelsucht / ist gut für Gifft / dreytägig oder viertägig Fieber / vertreibt die Würm im Leib / alle Morgen nüchtern getruncken. Hat die Krafft wie Gamanderlin. Das Wasser wie obsteht getruncken / ist gut zur engen Brust / und für das schwere Athmen / Geschwer der Lungen / Schwindsucht der Lungen / stärcket die Leber / und bringt dem Menschen gute Farbe. Das Wasser ist auch gut getruncken für Schmertzen desz Magens / für Verstopffung der Leber und Miltzes / auch Lenden und Blasenwehe. Mehr für Verstopffung desz Eingeweids / Magens und Bauchs / auch zur Geelsucht. Das Wasser reiniget die Nieren und Blasen vom

Gries und zertheilet den Stein in der Blasen. Getruncken dienet es auch zu den Blättern im Leib / Blutharnen und Grimmen. Eisenkrautwasser ist das beste Wasser für Hauptwehe und Schusz desz Haupts / die Stirn und Schläff offt damit bestrichen / und mit Tüchlin übergelegt / ist fast gut für langwirige Krankheiten / da man nicht weis wovon sie entspringen. Das Wasser ist gut für alle Nebel und Geschwer der Augen / stärckt das blöde Gesicht / bringt den Schein und Glast wider / alle Tag einmal oder zwey darein gethan / und darum gestrichen / gerieben / und Tüchlin darüber gelegt. Das Wasser ist auch gut für das Essen und Löcher an der Frauen Gemächt / dieselbige Morgens und Abends damit gewaschen / auch Tüchlin darinn genetzt und übergelegt. Disz Wasser vertreibt auch die Feigwartzen / damit gewaschen."

Hubert (1921) discusses the anatomy, chemical composition, and uses of Verbena officinalis. Crevost & Pételot (1934) tell us that in Indochina "La plante est considérée pas les indigènes comme amère et aromatique. D'après le R. P. Robert, elle passe pour régulariser les menstrues et pour guérir la 'boule hystérique'. On en fait, pour cela, use purée que l'on fait cuire et qui se prend avec de l'alcool de riz."

Manning (1956) says that infusions of this plant are used in reducing temperature in fevers and in the treatment of nervous disorders. Ward (1967) gives V. hastata L. as a synonym, which, of course, is ridiculous -- the two species cannot possibly be confused by anyone who has ever seen them both! He says that the plant is very bitter to taste, with a slight aromatic odor when rubbed, and is a nervine, tonic, emetic, and sudorific in medical usage. He notes that Coffin, writing 90 years ago, said "As an emetic it ranks next to lobelia; it is also one of the strongest sweating medicines in nature. It is good for colds, coughs and pain in the head, and some years ago was highly esteemed as a remedy for consumption. As an emetic it supercedes the use of antimony and ipecacuanha to both of which it is superior, since it not only produces all the good effects ascribed to the others, but it operates without any of the dangerous consequences that ever attach the use of antimonial preparations and cramps, and even death have been known to follow their use.....Vervain will relieve and cure those complaints in children which generally accompany teething; it likewise destroys worms, administered as a tea it powerfully assists the pains of labour; as a diuretic it increases the urinary discharge." Ward further states that the ounce-to-pint infusion is now used and taken in wineglass doses, and, as a nervine, Skullcap and Valerian are usually added.

Scopoli (1777) poses the question regarding the uses of Verbena officinalis: "Verbenam officinalem ad Cephalaeam etiam inveteratam commendat Haenivs?" Smith informs us that even as far away as the Ryukyu Islands this plant is regarded as medicinal, being used to bathe babies; it is found abundantly there in sandy and red earth. Airy Shaw (1966) points out that it was formerly held in great repute in Europe as a remedy in eye diseases, its bright corolla, like that of Euphrasia, being supposed, under the

old Doctrine of Signatures, to indicate its virtue in that direction. Rageau (1957) says that in New Caledonia it is regarded as "amère, âpre et aromatique. La plante entière est utilisée comme vulnéraire en médecine populaire française".

Lázaro e Ibiza (1921) asserts that the species is found throughout Spain, and there is regarded as "Es amarga y astringente, y fué usada como febrifuga, resolutiva y vulneraria; los antiguos la consideraban como sagrada." Al-Rawi & Chakravarty (1964) assert that the plant contains tannic acid, invertin, saponin, verbenalin, verberin, and emulsin, and is used even now as a corraborant, nervine, antispasmodic, febrifuge, tonic, aphrodisiac, antiscorbutic, galactagogue, detersive, emetic, sudorific, diuretic, and against whooping cough.

Alzate (1968) affirms that Verbena litoralis and V. hispida can be used as a substitute for V. officinalis where the latter is unavailable, and have the same properties: "Substituyen a la Verbena officinalis, común en Europa y se usan en decocciones o infusiones a dosis de 10 a 20 grms. por 200 de agua. Todos los médicos reconocen el gran valor de nuestras verbenas, para cortar las fiebres de origen gástrico y tifoidea, administrando la decocción en lavados y en forma de tisana. Reemplaza a la quinina. Los antiguos la consideraban como un remedio universal. Ahora como febríbugo, resolutivo y vulnerario. Las hojas y sumidades bien machacadas suelen usarse en cataplasmas, como vulnerarias, y el zumo se usa en infusión contra los dolores de cabeza. La planta fresca machacada y aplicada sobre las sienes y frente, calma el dolor de cabeza. Hervida en agua aplicada sobre heridas sucias y de larga supuración. El jugo de la planta, usado en fricciones, cura la sarna. El zumo cura la diarrea, la bilis y voluptuosidad. Las hojas y ramas hervidas curan y resuelven los tumores internos (tomar copitas). Los romanos y griegos la llamaban planta VIRGEN y la usaban en cataplasmas de hojas machacadas sobre la vejiga para combatir los derrames seminales nocturnos."

Martinez (1969) informs us that in Mexico "El cocimiento de las inflorescencias se usa para fortalecer el pelo. También se usa el polvo contra la hidropesía y la infusión teiforme o el extracto contra las fiebres intermitentes (en Nay. [=Nayarit]). En Zitácuaro, Mich. [=Michoacán], usan el cocimiento de las flores 'contra la biliosidad'. El Prof. Pedro M. Rodríguez dice citando al Dr. Ricci, que es eficaz contra las fiebres. Se hace un cocimiento de 5 gramos de hojas en medio litro de agua hirviendo y se deja consumir hasta la mitad, se cuela y se toma en ayunes durante varios días. En Nayarit toman el cocimiento antes de cada comida contra la fiebre. En Teleoloapan, Gro. [=Guerrero], lo toman con igual objeto, pero le añaden hojas de fresno.....la hojas majadas y aplicadas con aceite rosado o con enjundia de puerco, quita el mal de madre; y aplicándolas con vinagre apargan el fuego de San Antón y reprime las llagas corrompidas; mezcladas con miel sueldan las heridas; su bebida es contra tiricia (ictericia) y su cocimiento de sus hojas y raíces cura las hinchazones."

Gattinger (1894) asserts that in his time "The herb in flower" was used medicinally in Tennessee. Smith (1871) records the Chinese vernacular name "ma-pien-ts'au" for the plant, roughly translated as "horsewhip-plant". He affirms that the species is as common in China as it is in England and that it has received its common name from the long spiked inflorescence after the fall of the deciduous corollas. It is confused by the country folk with a species of Leonurus because of its similarly square stem. It is said to act on the blood, relieving congestions, obstructions, dropsical effusions, and haematoceles. It is also credited with emmenagogue, anthelmintic, and antoscrobutic properties. The root is said to be astringent.

Ferrándiz (1967) notes that the "Planta muy conocida en Europa y cultivada en todos los jardines, vulgaramente se la denomina la 'Hierba de todos los males' y en verdad que tiene diversas aplicaciones. Hervida la planta en agua se aplica sobre heridas tórpidas de larga supuración. En forma de té, 15 gramos en un litro de agua, calma la fiebre y en gárgaras, alivia las afecciones de boca y garganta. La planta fresca machacada, aplicándola sobre las sienes, alivia el dolor de cabeza. El agua destilada de verbena fortifica el nervio óptico y el jugo de la planta en fricciones, cura la sarna. Buena especialmente para males de estómabo, por excitar la digestión. Excelente febrífugo."

Verbena officinalis has been studied chemically very extensively. Cheymol (1937) reports the presence of stachyose in the roots and stems, as well as a verbenaloside which is apparently identical with cornine. Boudier (1907) isolated a verbenaline glucoside, while Asano and his associates (1942) found verbenalin yielding verbenalol and glucose. Verbenalin and a volatile oil were also reported by Breitwieser (1943), while Boudier (1908) isolated verbenalin, invertin, and emulsin. Huni and his associates (1966) report that V. officinalis specifically incorporates 2-^{14}C labelled melvalonic acid in the formation of a glycone moiety of verbalin. Echaust (1964) shows that the previously isolated verbenin and verbenalin are identical glycosides. He isolated, in addition, adenosin and β-carotene. Kariyone (1965) reports the same "adenosine" and β-carotene. Büchi & Manning (1960) provide a revised structural diagram for verbenalin. Reichert & Hoffmann (1935) proved that the glycoside, verbenalin, from Verbena officinalis, is identical with cornin from Benthamidia florida. Stecher (1968) gives its formula as $C_{17}H_{24}O_{10}$, the molecular weight as 388.36, C 52.57 percent, H 6.23 percent, and O 41.20 percent. Sakan & Abe (1968) show that verbenalol is the aglucone of verbenalin, a glycoside. The stereospecific synthesis of racemic verbenalol is presented as one of the most possible biogenetic precursors of the indole alkaloids and has a closely related structure to the components from Actinidia polygama and Boschniakia rossica.

Horodysky and his associates (1969) have also studied the biosynthesis of verbenalin (I) by the administration of acetate-1-^{14}C, acetate-2-^{14}C, mevalonate-2-^{14}C, and geraniol-1-^{14}C to

Verbena officinalis plants. When "I" which had been formed biosynthetically from mevalonate-2-^{14}C was degraded, randomization of the label between carbon atoms 6 and 9 was not observed; carbon atom 6 retained most of the radioactivity in young and old plants. Randomization between carbon atoms 3 and 8 varied with the age of the plant. There was complete randomization in young plants, limited randomization in older plants, and essentially non-randomization in senile plants. The percentage of radioactivity in carbon atom 3 predominated over that in carbon atom 8 as the plant age increased. The ratio of radioactivity found in aglucone to that in glucose is considered to be metabolically significant.

Savage (1945) reports that under genus 35 VERBENA in the Linnean Herbarium in London, sheet 15 is labeled "15 officinalis [spuria delet.]" and has the accepted specific name in Linné's own handwriting.

Kalm (1770) affirms that he personally saw this species growing in only one place in North America, shown to him by Bartram "in a little plain near his house" near Philadelphia, Pennsylvania. It is assumed that the species had been introduced there from some seeds imported from England by Bartram.

Patzak & Rechinger (1967) give the overall distribution of the species as "Europa a Britannia et Dania meridiem versus, Regio Mediterranea, Africa borealis, Asia occidentalis et centralis usque ad montes Pamir-Alaj et Tien Shan et ad Himalayas occidentales; in America borealem et Africa australem et in regiones alias introducta."

Martin (1965) describes the species as "rather local" in England and Wales, while Paton (1968) says that in Cornwall and the Isles of Scilly it is "frequent on waste ground during summer, often with Odonites verna". Perring & Walters (1962) affirm that it is "casual only" in the northern parts of its range in the British Isles. Bowen (1968) reports it from Berkshire, England, as "native, [in] dry grasslands, roadsides, in decreasing small quantities". Druce (1897) referred to it as "Native, Viatical. Dry gravelly waysides, pastures, &c. Local. More frequent on calcareous soil in sunny situations [Berkshire, England] .....found in all the bordering counties.....Rather common in [Pang] district.....on chalk ballast near Reading". Dickinson (1851) says of it "Roadsides and waste ground....Common....Frequent.....Plentiful" in the Liverpool area.

Erfurth (1867) reports it from "Wegränder, Gebüsch, Zäune, unbebaute Ort in der Nähe der Städte u. Dörfer" in Germany. Wagner (1905) says that it is found "An Wegrändern, auf Schutthaufen und wüsten Plätzen in Mittel- und Südeuropa und Asien, nördlich bis Südschweden; im Gebiet häufig." Dietrich (1824) found it "In Dörfern, auf Schutthaufen, an Zäunen u.s.w. überall häufig. Blüht vom Juli bis September" in the Berlin area of Germany. He notes that "Officinell war Herba Verbenae. Die Wurzel giebt den Gürken einen angenehmen Geschmack". Martens & Kemmler (1882) found it "häufig an Wegen und auf Schutt, doch selten über 580 m. aufsteigend" in Württemberg. He also notes that the plant is men-

tioned by Pliny. Rechinger (1965) says of it "Gewöhnl. E. -- Auf wüsten Plätzen....bei Bauernhäusern" in Austria. Ferguson & Natzio found it growing on a shingle beach backed by saltmarsh in Greece.

Montasir & Hassib (1956) state that Verbena officinalis is an important plant in oases and along the western Mediterranean parts of north Africa. Lazaro e Ibiza (1921) avers that it occurs in "Toda España". Sommier & Caruana Gatto (1915) say "Luoghi ruderali e lungo le vie. -- Malta e Gozo, abbastanza frequente!" In Italy Lanfrossi (1827) refers to it as "Comunissima; cresce ne' ruderi e lungo le strade e fioresce in Giugno, Luglio ed Adosta", while Tornabene (1891) found it "in ruderatis, ad vias et in hortis pedemontanae regionisi Catania, Mascalucia, Nicolosi" in the Mount Etna region. He comments that "Olim apud medicos laudata ob vim adstringentem, vulnerariam. Nunc exoleta." Bertolini (1844) asserts that it is "Vulgaris in viis, ruderatis, collibus totius Italiae". In Belgium it was found by Sauzé & Maillart (1880) on the "Bords des chemins, lieux incultes", while both there and in Luxemburg Paque (1902) found it growing in "Lieux incultes, bords des chemins".

Catanzaro (1970) says that it inhabits "coltivati, incolti coltivabili e aridi, lungo le strade" in the Bivona region. Polunin (1969) reports that it is found in "Waste ground, waysides, screes.....Much of Eur. (except Is. [=Iceland]): introd. IRL. N. S. SF. [=Ireland, Norway, Sweden, Finland] Used in herbal remedies". Bouloumoy (1930) found it in "Lieux incultes; bords des chemins. Partout" in Lebanon and Syria. Harvey (1868) says "V. officinalis is common and seems to be truly wild" in South Africa. In his 1838 work he says "V. officinalis, or a species much resembling it, is common in the neighborhood of cultivation". In Lesotho it is said by Guillarmod (1971) to be "widespread in Southern Africa: often a weed of cultivated ground".

In Afghanistan it is described by Aitchison (1880) as "Common everywhere from Thal to the Kuram district up to 7000 feet; April to July". In Nepal, according to Banerjee & Shakya, it is "locally distributed"; in Bhutan, according to Deb, Gupta, & Malick (1968), it occurs in open situations; in Pakistan Hussain (1969) says it grows "in moist ground around ponds". Tingle (1967) reports it from Hongkong. Prain (1903) found it to be "A weed in waste places. In all the provinces" of Bengal. Clarke (1885) tells us that it is found in the "Himalaya, alt. 1--6000 ft., from Kashmir to Bhotan, frequent. Bengal Plain to the Sunderabunds, frequent. -- Distrib. Temperate and subtropical regions... T. Thomson collected at Kussoor, and Clarke at Chumba, a monstrous form with proliferous spikes, forming densely branched panicles, the lower flowers all pedicelled, variously altered and infertile" [this latter form is probably what is now known as Stachytarpheta jamaicensis f. monstrosa (Moldenke) Moldenke, due to a virus infection of Stachytarpheta jamaicensis (L.) Vahl, and has nothing to do with Verbena officinalis].

Balakrishnan (1964) records V. officinalis from Madras and

claims that it is the only wild species of the genus in India. Doubtless he means that it is the only native wild species, since at least three other species of Verbena have become naturalized there or have escaped from cultivation in some localities. Rau (1963) records it from altitudes of 1500--2500 meters in Uttar Pradesh, India; Maheshwari (1963) found it to be "Common along canal banks, near temporary puddles and stagnant water channels" in the Delhi area, where it flowers and fruits from April to October. Puri (1960) says that it occurs frequently in both burned and unburned areas in Indian forest quadrats and burned Pinus longifolia forests. Banerji (1965) speaks of it as only "occasional". Dattar & Majumdar (1966) assert that it is "distributed in the temperate regions". Kapoor (1968) refers to it as "occasional" in Kashmir, while the Banerjees (1969) record it from Bihar.

Ohwi (1965) speaks of it as a "Weed in waste grounds and along roadsides in lowlands; Honshu, Shikoku, Kyushu. -- A nearly cosmopolitan weed". Yamazaki (1966) refers to it as "Cosmopolitan in tropical and subtropical regions". Walker found it to be a weed in waste places on Okinawa.

Gilkey & Dennis (1967) tell us that "In ballast about Portland [Oregon] has been found Verbena officinalis L.....with...white (rarely purplish) flowers". Wherry (1967) reports it from Delaware County, Pennsylvania, while Domville & Dunbar (1970) refer to it as "adventive, rare in rich thickets, Summer" in Ulster County, New York. Carter & Jones (1968) report it from Forrest County, Mississippi, but I imagine that their record is based on a misidentification of V. halei Small. Gattinger (1894) found V. officinalis "Nearly everywhere about houses and settlements in sandy soil" in Tennessee. Sudworth, in 1890, found it abundant in the District of Columbia area. Tatnall (1946) records it from New Castle County, Delaware, Cecil, Sussex, and Worcester Counties, Maryland, and northern Accomac County, Virginia. Radford, Ahles, & Bell (1964) refer to it as infrequent in waste places in Hyde, Jones, and Mitchell Counties, North Carolina, and Aiken and Darlington Counties, South Carolina, flowering there from June to October.

Lems (1960) records V. officinalis from Gran Canaria and Tenerife in the Canary Islands; Pampanini (1930) records it from Cyrenaica, Hanson (1969) from Madeira, Porto Santo, Funchal, the Azores, and the Canary Islands, and Sykes (1970) from Niue island. Pedersen (1969) reviews its distribution in Denmark, as well as its extra-limital distribution in the rest of Europe, the Near East, and northwestern Africa. Voigt (1845) and Hara (1966) assert that it is cultivated in India. Masamune (1955) records it from Tanegasima, Yakusima, Takarazima, Amami-osima, Iheyazima, Isagaki, Iriomote, and Yonakuni islands. Perring & Walters (1962) record it from many localities in Eire, and Gupta (1967) from 2300 meters altitude in Uttar Pradesh, India. Macbride (1960) avers that it "probably" occurs in Peru, but he apparently saw no actual specimens to substantiate this supposition, nor to date have I.

Abrams (1951) records this plant from Amador County, California, and Portland, Oregon. Martinez (1969) reports it from "Hidalgo,

Valle de México, Estado de México, etc.", but I have personally seen it only from Nuevo León and suspect that the other references may apply to the very similar V. menthaefolia Benth., although V. officinalis is certainly to be expected in and about Mexico City and some of the other large cities of Mexico, especially ports.

Andersson (1859) records V. officinalis from the Galapagos Islands on the basis of a Charles Darwin collection from James Island, but gives in synonymy "V. caroliniana L. V. polystachya HBK. var. foliis incisis, laciniis grosse serratis (Hook., l. c. p. 195)". Examination of the Darwin specimen, however, has revealed that it is actually V. glabrata var. tenuispicata Moldenke. Hooker's plant and description apply to another Darwin collection from the same island, which is now the type collection of V. sedula var. darwinii Moldenke. The true V. officinalis L., therefore, is not known from the Galapagos Islands.

Bouchet & Andy (1966) report that where V. officinalis is regarded as an undesirable weed it may be controlled by use of the herbicides "dichlobenil" and "chlorthiamid", used at the rate of 3 kg. per hectare. It is not affected by buturon, parquat, diquat, 11561RP, nor any mixtures of these.

Hirata (1966) lists the following fungi as infesting the species: Erysiphe cichoracearum (in Germany, Russia, and Yugoslavia), Erysiphe polyphaga (in France, Switzerland, and Italy), Leveillula taurica (in Iran), Oidium verbenae (in Corsica, France, Greece, Israel, Japan, Lebanon, Romania, and Switzerland), and Oidium sp. (in Spain). Grove (1935) adds to this list Septoria verbenae Rob. & Desm.

I am very grateful to Dr. G. H. M. Lawrence and the Hunt Botanical Library in Pittsburgh, Pennsylvania, for enabling me to see a copy of the Macer (1477) work listed in the bibliography of this species. Dr. Lawrence points out that the pages were originally unnumbered and the Roman numerals now appearing on them were apparently added at a much later date. The volume is discussed in Hunt Bot. Cat. 1: 5 (1958) and the date of publication is given as 1477, rather than "1487" as given in Pritzel's "Thesaurus" or as "ca. 1490" as given elsewhere. I am indebted to Dr. J. J. Wurdack of the United States National Museum for the latter information. He reports that Agnes Arber also discusses this work in her book on herbals. This Macer reference is the earliest which I have as yet seen personally, although the bibliographic history of the species goes back to 37 B.C.

J. H. Moris, Flora Sardoa, vol. 3, also listed in the bibliography of V. officinalis in a previous installment of the present series of notes, is actually inscribed "1858-1859" on the title-page, but my good friend, Dr. W. T. Stearn, in a letter to me dated March 8, 1972, says "regarding the publication of Vol. 3 of Moris, Flora Sardoa, all I can say is that despite much search the only review found is one of 1860 covering the work as a whole. I can find no evidence that it was issued in parts and I should thus simply date vol. 3 as '1859'".

Mr. F. J. Anderson has kindly researched in the library of the New York Botanical Garden the date of publication of Georgi Jan's "Hortus Elenchus". He reports that this work is not treated in Pritzel nor in Stafleu, but according to the Catalogue of the British Museum Library (2: 924) the plants listed were collected in 1826 and the work published in 1831. He states, further, that the Matthioli, Disc. Valgr., references in the same bibliography of this species are apparently correct. "It is page 1107 of Discorsi ne i sei libri....published by Valgrisi in 1585 at Venice. No copy of that edition is in the N. Y. B. G. [=New York Botanical Garden library] but we have the edition of same title, printed by Valgrisi in 1568 and both the figure and the text relating to Verbenaca appear on page 1107 of that work." He also notes that "Johann Schröder's Chymic. Dispens. 1669 is actually his Pharmacopeia Medico-Chymica first published in 1641. Our library has the 1649 ed. and it mentions Verbena on pages 167-168. As to Orsin. Cap. Opusc. -- No trace of this author or title. It may be part of a serial journal." The last reference in this memorandum is to the "Orsin. in Cap. Opusc. p. 288" citation given by Bertolini (1844) which I have thus far been unable to verify.

It should be mentioned here that the two Maximowicz (1886) citations in the bibliography are often mis-dated "1887". The Robert Brown reprint (1821) is dated as 1821 by Pritzel, but as "1819" by Barnhart. The Tobe (1969) reference is erroneously given as page "159" in the index of the work, while the Farnsworth (1970) reference to item 15121 is erroneously listed in the index of the work as item "15105". The illustration in Hatton's work (1960) is said to have been taken from "M. (1565) 1052", but as yet I have been unable to trace this reference.

The Curtis (1775) publication is often cited as having been published in 1772, 1773, or 1777, but according to Stafleu, Tax. Lit. 90 (1967), plate 41 was originally published in May of 1775; 1777 is the title-page date for the whole volume, The Müller (1775) publication is often cited as "1777" also, but here, again, that is the volume title-page date; the title-page date for fascicle eleven, in which plate 628 appears, is "1775". The Bulliard work (1785) is often cited to vol. "3 & 4" or "5", but the volume appears to be unnumbered, at least in the library of the New York Botanical Garden.

The Sibthorp & Smith (1809) bibliographic reference is often cited as "1806", but pages 219--442 of this work were not issued until 1809. The Boswell Syme (1866) reference is sometimes cited as "1863", but volume 6 of this edition was actually not issued until 1866. The Druce publication (1898), although dated "1897" on its title-page, was actually not published until 1898 according to a writer in Journ. Bot. 36: 104 (1898). The Gerarde (1597) work is cited by some authors as "Ger. Em. 718".

It is also worth mentioning here that certain homonyms of names listed in the synonymy of V. officinalis do not apply to this plant at all: Verbena foemina Trag. is a synonym of Sisymbrium officinale L. in the Brassicaceae, Verbena foemina Brunf. is a

synonym of Senecio vulgaris L. in the Carduaceae, and Verbena recta sive mas Fuchs is a synonym of Sisymbrium officinale L. The Verbena sacra Gerarde, included in the synonymy of V. officinalis by me in a previous installment of this series of notes, appears actually to be synonymous with V. supina L., as an examination of the illustration given by Gerarde (1597, 1633) plainly shows.

Of considerable interest is the fact that Tournefort (1719) lists four "kinds" of Verbena: (1) Verbena communis coeruleo flore, Common vervain with blue flowers, (2) Verbena lusitanica, latifolia, procerior, Portuguese vervain, (3) Verbena tenuifolia, thin-leaved vervain, and (4) Verbena urticae-folia, canadensis, foliis incisis, flore majore, nettle-leaved vervain of Canada, with cut leaves, and a larger flower. All of these except the third have usually been relegated to the synonymy of V. officinalis -- the third being regarded as V. supina L. -- but on this disposition of these names I have grave reservations. More study is required here.

Similarly, Haller (1768, p. 96) describes a variety "β Foliis vix dissectis Hort. Florent. 98 [=Manetti, Virid. Florent. 98. 1751]". This is probably the same variety listed by Bertolini (1844) as "Eadem foliis non, vel parum dissectis". Haller (1768, p. 661) also lists a variety "γ Folia variegato Breyn. Prodr. 2. 100". It is not clear to me if either of these varietal descriptions apply to any of the eleven subspecific taxa at present recognized in V. officinalis, but the former may be the same as var. latiloba Sennen.

The Bayliss BS.3045, distributed as V. officinalis, is actually V. brasiliensis Vell.; E. Contreras 5247 is V. carolina f. albiflora Moldenke; E. Hall 432, Edw. Palmer 1043, G. T. Robbins 2410 & 2486, F. H. Sargent 7745, K. E. Smith s.n. [Palestine, 4/21/35], Tharp s.n. [Austin, 5/2/35] & s.n. [Austin, 5/9/35], R. D. Thomas 2825, and Vollum s.n. [Fort Belknap, 1855] are all V. halei Small; E. Contreras 6152 is V. litoralis H.B.K.; Hodgkins s.n. [Herb. Bot. Div. D. S. I. R. 2052] is V. officinalis var. grandiflora Hausskn.; Healy 60/64 [Herb. Bot. Div. D. S. I. R. 70249a] is V. officinalis var. prostrata Gren. & Godr.; T. J. Hale s.n. [Baraboo, 1861] is xV. perriana Moldenke; and C. Ritchie 57 is in part V. rigida Spreng. and in part some other species.

Löve (1971) cites Murin & Sheikh s.n. from Iraq as the basis for his report of the chromosome count of 2n = 14 in this species. Guillarmod (1971) cites Dieterlen 329, Guillarmod 414 & 1435, and Laydevant s.n. from Lesotho, deposited in the herbaria at Capetown, the University of Basutoland, the Albany Museum at Grahamstown, and the National Herbarium at Durban. Franchet (1883) cites Franchet 1017 from Turkestan; Banerji (1965) cites Banerji 1069 from Nepal; Deb, Sengupta, & Malick (1968) cite Sengupta 1271, 1275, & 1278 and Deb 329 from Bhutan.

[to be continued]