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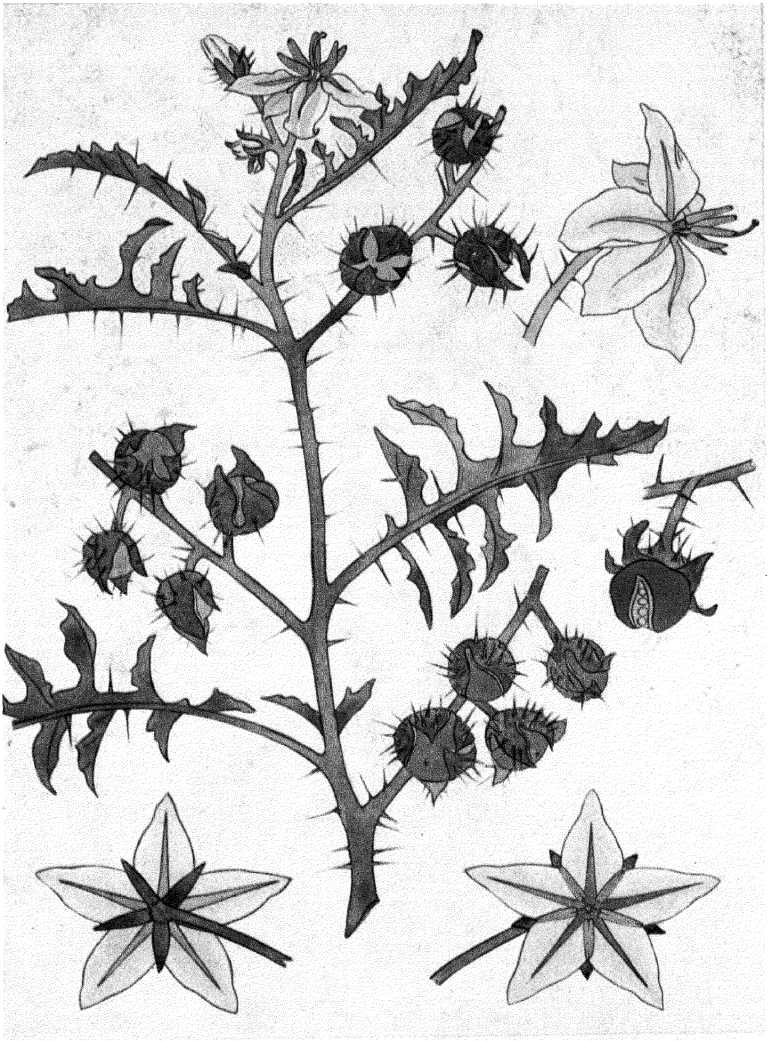

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THE MEDICINAL AND POISONOUS PLANTS OF SOUTHERN AFRICA

BEING

An Account of their Medicinal Uses, Chemical Composition, Pharmacological Effects and Toxicology in Man and Animal

By

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to the
Progress of Science
in
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PREFACE

SOUTHERN AFRICA, with its wealth and variety of flora, has accumulated through the centuries a great mass of popular remedies, both Native and European. It has only recently been realised how rich African lore is in this respect. Bushman, Hottentot, and Bantu have each their full share, while the White man, since his occupation of the sub-continent, has been adding to the treasury.

These remedies are in common use, but much of the folk-medicine of the South African native tribes is vanishing before the advancing tide of civilisation with its synthetic medicines. There is little doubt that the greater part of it will have disappeared in the course of a few years, and the recording of it has seemed to us to be a matter of urgency.

Many of our plants are poisonous, but frequently we lack precise knowledge regarding their effects. This is especially so in the case of plants which produce human poisoning. The position is more satisfactory in regard to animal intoxications, thanks to the work of the veterinary section of the Agricultural Department of the Union of South Africa. In both groups, however, much remains to be done to improve our knowledge of their chemical composition and effects so that cases of plant poisoning in man and animal may be diagnosed and treated intelligently and effectually.

A more recent development is the increasing commercial exploitation of the medicinal plants, particularly as proprietary and secret remedies. We believe that anything which leads to a greater utilisation of the natural products of South Africa should be encouraged. We hope that this book will assist such development and will lead to a critical examination of the claims made for any remedies which come on the market.

Our aim has been to give all the available information on the medicinal uses, chemical composition, pharmacological effects, and human and veterinary toxicology of the flora of Southern Africa. It forms an amazing record, though there are many lacunae. Of recent years there has been a marked increase in the output of research, especially from South African laboratories, on the chemistry, pharmacology, and toxicology of these plants. We hope that the appearance of this book will give an impetus to such work and prove a stimulus to the great body of medical practitioners in Southern Africa to record cases of plant poisoning which come their way.

The book should form a useful basis for new work and prevent to some extent the overlapping and repetition which is liable to occur in work of this nature. We hope, too, that the medical practitioner, the pharmacist, the missionary, the forensic worker, and the scientist will find it of value in their several spheres. With this in view, four indices have been carefully prepared

so that access to any data may be easily found. The indices give (1) botanical names of the plants, (2) common names from European languages, (3) native names, and (4) names of active principles. Obsolete names have been recorded, for they frequently occur in literature and may be the only cue which a reader has.

We have been at great pains to find all references to the subject, particularly those giving the results of research into the chemistry and pharmacology of the plants. In most cases we have seen the references in the original, but, where this proved impossible, the fact has been indicated. If any reader knows of data which we have not mentioned, we should be grateful if he would communicate with us.

Our sincere thanks are tendered to the many members of the general public of South Africa who have given us such patient and valuable assistance in collecting information. We are deeply indebted to the Staff of the Division of Plant Industry at Pretoria for determining our plant specimens, which number over 2,500. We thank, also, the Bantu Research Committee of the University of the Witwatersrand for the financial assistance which has made the work possible.

Lastly, we wish to record our appreciation of the interest and assistance of our publishers. They have contributed a great deal to the satisfactory production of the book.

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INTRODUCTION

On account of the lack of precise knowledge of the chemical composition and medicinal and toxic effects of many of our plants, it has proved impossible to arrange the material in this book under any other system than botanical families. The plants are therefore arranged according to the system of Harms which, in its application to the South African flora, is given in Phillips' "The Genera of South African Flowering Plants." The lower orders will be found at the end of the book. No plant has been included if it is used as a charm only.

The indices have been prepared with great care so that any information may be traced through the botanical name, the English or the Afrikaans names, or the Native name of the plant. Botanical research is constantly improving the accuracy of plant naming, and we have given in all cases the modern accepted nomenclature. It should be pointed out, however, that the Division of Plant Industry is responsible only for the names of specimens which were determined by them. Where it seemed advisable, we have recorded obsolete names both in the text and in the index. In the case of the Afrikaans names, we have had the valuable assistance of Dr J. J. le Roux, Senior Lecturer in the Department of Afrikaans and Nederlands in the University of the Witwatersrand, who has given us the modern accepted orthography. Likewise, in the case of Native names, we have had the equally valuable assistance of Dr N. J. van Warmelo, Ethnologist to the Government of the Union of South Africa. We are grateful to both these gentlemen for the trouble they have taken. The orthography of Native names has given us a great deal of thought. Following the advice of Dr van Warmelo, we have spelt Native plant names without capitals, *e.g.*, Suto *moferefere*. In Zulu and Xosa, and occasionally in other languages, the initial of the stem is capitalised, *e.g.*, Zulu *iBozane*. In the latter case, the name is indexed under both the prefix and the stem. In order to obtain uniformity and to avoid the perpetuation of the misuse of prefixes, the names of Native tribes and languages have been given always in the form of the stem, *e.g.*, Chuana instead of Bechuana or Sechuana, Kxatla instead of BaKxatla.

The English, Afrikaans, or Native name of a plant is often useful in tracing its identity through the Index. Thus *Wilde als* is applied only to *Artemisia afra Jacq.* and to no other plant. On the other hand, a single common

name may be applied to several plants which are not related to each other. A good example of this is the name *Dawidjies*, which is applied to *Cissampelos capensis Thunb.* (Menispermaceae), *Cynanchum africanum R. Br.* (Asclepiadaceae) and *Melothria punctata Cogn.* (Cucurbitaceae).

We shall always be glad to assist correspondents in tracing the botanical identity of a plant, but it is important that suitable specimens of the plant be forwarded to us together with some particulars of its use or effects and its habitat. To facilitate this, we give suggestions in an Appendix. All such specimens, when sufficiently good, have, up to date, been housed in the National Herbarium of the Division of Plant Industry. Thus, quite apart from their utility to us and our correspondents as a means of determination, they form an addition to the collected material of that Division. Correspondents should not hesitate to send us reports on and specimens of plants used only as charms, because we are interested in this aspect of the subject, and have already a considerable collection of such data.

Readers will find frequent references in the text by the name of the author only. In such cases the reference is usually to a publication dealing with the uses of plants and not to the chemistry or pharmacology. If these had been inserted in the lists of references at the end of each family, the list would have swollen to unmanageable dimensions in many instances without any real additional value. We have therefore collected these references in an Appendix.

"The reward of labour is the results thereof."

The Medicinal and Poisonous Plants of Southern Africa

I. TAXACEAE

No member of this family is used medicinally, but two have been found to yield tannin. The bark of **Podocarpus elongatus l'Hérit.,** Outeniqua yellow wood, Common yellow wood, Smooth-barked yellow wood. Outenikwa geelhout, contains 2·88 per cent.; and the bark of **Podocarpus latifolius (Thunb.) R.Br.,** Upright yellow wood, Rough-barked yellow wood, True yellow wood, Broad-leaved yellow wood, Opregte geelhout, Regte geelhout, 2·65 per cent.[1]

REFERENCE

1. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

II. PINACEAE

Pappe records that a yellow, transparent gum exudes from the branches and cones of **Widdringtonia juniperoides Endl.,** Sederboom, and of **Widdringtonia cupressoides Endl.** (Thuia cupressoides Thunb.), and was formerly used as a fumigation in gout, rheumatism, and oedematous swellings, and for making plasters and varnish.

III. TYPHACEAE

Typha capensis Rohrb., Bulrush, Poker, Palmiet, Papkuil, Matjesgoed, Zulu *iBhuma*, is used medicinally by the Zulus and the Xosas. The former use a decoction of the root in the treatment of venereal diseases, and the latter to aid in the expulsion of the placenta in man and animal. **Typha latifolia Krauss.,** Cat-tail, *umKhanzi*, is used by natives during parturition, with the idea that it strengthens the uterine contractions. Typha latifolia Krauss. appears to be identical with Typha capensis Rohrb.[1] Pammel states that the plant is poisonous, but gives no details.

REFERENCE

1. W. H. Harvey and O. W. Sonder: Flora Capensis, i, 39.

IV. GRAMINEAE

The male flowers of **Zea mais L.,** Mealie, Indian corn, Maize, Mielie, Suto *poone*, are said to contain hydrocyanic acid (Walsh). He states that animals are sometimes poisoned from eating the green plant. This poisoning has been variously ascribed to tympanitis or hoven, to potassium nitrate, or to some parasitic growth upon the plant. The first seems to be the most likely cause. The pollen is a possible cause of hay fever. The so-called " corn-silk " is known as *Zea*, and has been used in Europe and America in the treatment of genito-urinary diseases.[1]

Strings of the seeds of **Coix lachryma-jobi L.,** Job's tears, Jobstrane, are worn by infants with the idea of warding off teething troubles [1] (Pijper). A tincture or a decoction of the seed has been used in Europe for catarrhal affections of the air passages.[1] In Japan and elsewhere [1] the seeds are used as food.

The Sutos use the root of **Imperata arundinacea Cyr.,** *var.* **thunbergii Hack.,** Suto *mohlorumo*, *mohlaba-lerumo*, Zulu *umThente*, in making a medicine for chest colds in children (Phillips), while the Zulus regard the root as a specific for hiccough (Bryant).

According to Phillips, the leaf of **Miscanthidium sorghum (Nees.) Stapf.,** formerly known as Erianthus sorghum Nees., Suto *mothala*, causes a rash when rubbed on the skin. He says the plant is used medicinally by the Sutos.

Elionurus argenteus Nees., Suto *hloko*, is used by the Sutos as a colic remedy (Phillips). Wood [2] states that *var.* **thymodora** probably contains a volatile oil.

The Zulus use the root of **Andropogon marginatus Steud.,** Tambootie grass, Zulu *isiQunga*, as an anthelmintic. In practice, an infusion made with a number of other plant ingredients is used, and this infusion is stated to be purgative (Bryant).

The Sutos and Pedis use **Andropogon schoenanthus L.,** *var.* **versicolor Hack.** (Cymbopogon excavatus Stapf.), Ginger grass, Suto *patiyane*, medicinally. The Sutos also place the grass in the bottom of the large grain baskets to keep away rats and mice, which apparently do not gnaw through it on account of its bitterness (Phillips). The grass yields a valuable oil, known as *palmarosa oil* (*pamorusa oil*).[3] This is said to contain *perilla alcohol*, $C_{10}H_{16}O$.[4] It is used as an adulterant of oil of rose.

A preparation made from **Andropogon sorghum Brot.,** *var.* **saccharatus Korn.,** Suto *nthswê*, and **Erigeron canadense L.,** is a Suto remedy for eczema. Attempts have been made to use the former as a source of sugar, but these were not successful on account of the difficulty of crystallising the product.[1]

Many investigators have recorded the fact that **Sorghum vulgare Pres.** (Andropogon sorghum Brot.), Kaffir corn, Broom corn, Shallu, Durra, Sorghum, Zulu *amaBele*, is sometimes toxic to stock. The plant becomes toxic, particularly when cut after drought or when frosted, the toxic action being due to hydrocyanic acid. Dunstan and Henry [5] isolated from young plants a cyanogenetic glucoside, *durrin*, $C_{14}H_{17}O_7N$, and a ferment. Other grasses which

have been found to yield hydrocyanic acid are **Chrysopogon serrulatus Trin.**, **Themeda triandra Forsk.**, **Anthephora pubescens Nees.**, Wool grass, Bloubuffel, Borseltjiegras, **Digitaria eriantha Steud.**, Suto *nmoyane*, **Aristida congesta Roem. and Schult.**, Steekgras, Suto *phutha-dikxoba*, *mahlaswa*, **Aristida uniplumis Licht.**, Langbeen T'waa, **Sporobolus fimbriatus Nees.**, Suto *matulo-a-maholo*, **Chloris petraea Thunb.**, Suto *sebokunyana*, and **Pogonarthria falcata Rendle.**, Suto *mongoyane*, usually when wilted or withered.[6]

The leaves of **Andropogon sorghum,** *var.* **sudanensis Pejer.** (Sorghum sudanense Stapf.), Sudan grass, at certain stages of growth, are poisonous to cattle.[7]

The Sutos use **Andropogon contortus L.,** Suto *selokana*, with **Tribulus terrestris L.** for the treatment of rheumatism in the hands; and **Andropogon dieterlenii Stapf.** (Cymbopogon dieterlenii Stapf.), Suto *lebatjana*, together with **Elionurus argenteus Nees.,** as a medicine for wounds, in the treatment of "*modikana*" (an eruption which affects people who have not undergone certain tribal rites), and as "*moditola*," a medicine to make young men strong and true.

Smith states that the Xosas were in the habit of keeping one or two species of **Andropogon,** Lemoengras, Xosa *isiFikane*, in their huts for the pleasant odour.

Cymbopogon marginatus Stapf., formerly known as Andropogon nardus L., *var.* marginatus Hack., Motwortel, Kuskus, Akkewani (in Java Akerwani), Suto *phalana-tsa-badimo*, *lebate*, Zulu *isiQunga*, is used by the Sutos in the bath as a love charm, and by the Zulus as an enema for pains in the stomach in infants. For the former purpose, the roots are dried and powdered and the powder used; for the latter, the roots are pounded and soaked in milk fresh from the cow. Phillips states that the Sutos also use the plant in the treatment of chest diseases. It is known as motwortel because the root stock keeps moths away from woollen goods.[8] Marloth [8] states that it is aromatic.

Cymbopogon excavatus Stapf., Buchu grass, Turpentine grass (one of the "turpentine grasses"), Stinkgras, Koperdraad, contains a pungent essential oil,[9] and has therefore a strong resinous taste. The root, in the form of a decoction, is given internally for the prevention of malaria and horse-sickness.

The root of **Cymbopogon validus Stapf.,** Tambuti, Tambookie, is a Zulu emetic.

According to Phillips, the Sutos use **Arundinella ecklonii Nees.,** Suto *mahlakamane*, in compounding many medicines and in making a lotion for washing wounds.

Melinis minutiflora Beauv., Gordura grass, Efwatakala, on account of the fact that the glandular hairs on the leaves secrete a viscid oil with a strong odour when the plant is fresh, has been suggested as a suitable grass to grow in tsetse-fly belts as a repellent.[10] Phillips [25] says that it is useless.

Steyn [11] is of the opinion that **Panicum maximum** Jacquin, Buffelgras (Trans.), Blousaad (O.F.S.), and other species of Panicum are responsible for the production of **Dikoor.** This is a disease affecting only young sheep (four to twelve months) which are running on old lands. It does not affect sheep on the open veld. The disease breaks out after rains in very hot weather.

Steyn thinks the plant may cause the disease when eaten in its youngest stages and wilted, or that it may be due to the development of a smut on the grass, which, either itself or by the products produced by it, may cause the disease. The disease resembles the " yellow " or " toxaemic jaundice " of Australia.

Dikoor occurs from November to April, and presents the following symptoms :—*First stage :* Rubbing of the ears, face, and nose, and local warmth, lasting about two days. *Second stage :* The animal becomes depressed, and swelling of the ears, eyelids, face, lips, and intermandibular region appears. These parts are warm, tender, and oedematous. Dyspnoea occurs from swelling of the nostrils, and the animal, on account of the local condition, has difficulty in eating and drinking. In some cases the general temperature is raised. *Third stage :* The local swelling becomes worse, and there is discharge from the nose, eyes, and lips. The oedematous fluid oozes through the skin, and drying, forms yellow-brown crusts. The discharge from the nose, etc., is at first serous, but in one or two days becomes purulent. Death may occur in this stage, either from asphyxia due to the local condition or to partial asphyxia plus toxaemia from the causal agent. Later the swelling subsides, but the discharge causes sealing of the eyelids and marked nasal obstruction. *Fourth stage :* The swelling has by now almost completely disappeared, and mummification of the skin begins. This progresses until movements of jaw and face become impossible. The mummified skin is covered with crusts. The animal is unable to feed and drink, has a high general temperature, and shows icterus of the visible mucosae and unwoolled parts of the skin. The discharge from nose, etc., is greater than previously. *Fifth stage :* The swelling completely disappears and the skin necroses and sloughs off, leaving a red, hairless area. An infective dermatitis may supervene. The eyelids are sealed, and when drawn apart reveal complete septic destruction of the eyeballs. Icterus and fever continue. Nasal obstruction causes marked dyspnoea. Death is by asphyxia or starvation. The disease runs a course of from several days to several weeks. The morbidity may be as high as 40 per cent. and the mortality in affected animals 60 per cent.

Panicum helopus glabrescens K. Schum., *sinande*, is said to be toxic to horses, and natives use the root medicinally.[23]

The Assistant Native Commissioner at Filabusi (Southern Rhodesia) states that the juice of **Brachiaria nigropedata Stapf.,** *mlabie*, produces serious poisoning when taken internally, and burns the skin when applied to it.

The Zulus use **Setaria sulcata Raddi,** Buffalo grass, Buffelgras, Zulu *u Babe*, crushed and mixed with water, as an external application for bruises. The seed is toxic when fed to small birds.[12]

Pennisetum typhoideum Rich., Pearl millet, Suto *nyalothie*, is used by the Sutos as a medicine for cows which have been incompletely delivered at parturition. They also make a very intoxicating beer from the grain.

Avenin, an alkaloid isolated from the pericarp of **Avena sativa L.,** Oats, Hawer, is said to stimulate the neuro-muscular system in mammals,[13] but Kobert [21] doubts this, as he found Merck's avenin to be inactive.

The Sutos administer water, in which the leaves and roots of **Cynodon hirsutus Stent.,** Dog grass, Suto *mohlwa*, and the paw or a piece of the skin of

FIG. 1.

FIG. 2.

FIG. 3.

DIKOOR.

Poisoning by Panicum maximum and other spp. Panicum.

FIG. 1.—Second Stage, showing the Swelling of the Lips, Nose, Eyelids, and Ears.
FIG. 2.—Third Stage, showing the Commencement of Mummification of the Skin.
FIG. 3.—Fifth Stage—Ears and Lips in Process of Dropping off.

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[*Facing page* 4

an ant-bear have been boiled, to women in labour to make the confinement easy.

Cynodon dactylon Pers., Florida grass, Germiston grass, Bahama grass, Scotch grass, Devil's grass, Bermuda quick grass, Bermuda grass, Dub grass, Doab grass, Fine couch grass, Batawiese-kweek, Fynkweek, Kwaggakweek, Oostindiese-kweek, Kruisgras, Kweek, Suto *mohlwa*, *morara*, Xosa *uQaqaqa*, is used medicinally by Europeans in the Transvaal. For heartburn, it is taken bruised, and mixed with sodium bicarbonate and other substances, and the bruised plant alone is applied as a styptic to wounds. The Xosas use a decoction as a lotion for sores and swellings. The grass is the chief adulterant of **Agropyron repens (L.) Beauv.,** Triticum, Couch grass, Dog grass, which is used internally in orthodox medicine as a demulcent drink for irritable bladder, and in cystitis.[1] It is thought that Cynodon dactylon Pers. is probably as efficacious as Agropyron repens Beauv. This grass is also one of the causes of Hay Fever in South Africa and in North America.[14] **Cynodon bradleyi Stent.,** Bradley grass, yields hydrocyanic acid.[22]

A decoction of **Chloris compressa Nees.,** Xosa *uMadolwana*, or of its roots, has been used by the Xosas as an addition to baths for the treatment of colds and rheumatism (Smith).

Eleusine coracana Gaertn., Shangaan *liphokho*, is used by the Tongas and Shangaans along with **Plumbago zeylanica L.** as an internal remedy for leprosy. The fruit is a cereal in some parts of the world.

According to Phillips, the Sutos regard **Crossotropis grandiglumis Rendle.,** Suto *yoang-ba-tsela* (?), as somewhat poisonous.

The Zulus use a decoction of the roots of **Eragrostis plana Nees.,** Os-polgras, Blousaad, Zulu *um Tshiki*, Suto *modula*, *mosita-thôlô*, for the treatment of profuse menstruation (Bryant). The Sutos use the plant as a tonic (Phillips). Pirie [14] states that the pollen of this grass is a common cause of Hay Fever in the Johannesburg district. At Filabusi (Southern Rhodesia) the juice of **Eragrostis sp.** (sp. under revision), *mlabie* (?), is regarded as being very poisonous when taken internally, and burns the skin when brought in contact with it.

Melica decumbens Thunb., Dronkgras, Kaapse dronkgras, Suto *ntlo-ya-thaba-e-nyenyane*, *ntlo-ya-motinyane-e-nyenyane* (?), is suspected of being poisonous,[15] though Marloth [15] states that any possible toxic effects may be due to the presence of a fungus on the plant. Walsh [16] states definitely that the plant produces symptoms of "intoxication" in cattle and horses, but seldom fatal poisoning. Hutcheon,[17] as far back as 1894, recorded that **Melica dendroides Lehm.,** Dronkgras, is irritant to stock, causing gastro-intestinal symptoms.

The seed of **Lolium temulentum L.,** Darnel, Bearded darnel, Cheat, Drabok, Dronkgras, a foreign plant now half-wild in South Africa, is alleged to be toxic,[1, 2, 3] producing vertigo, dizziness, headache, somnolence, and general intoxication in man, dogs, sheep, and horses, but not in hogs, cows, and poultry.[1] Walsh [16] says that the weed, when included in forage, produces giddiness in horses. Pammel [3] mentions that it is a deliriant poison. Antze [18] isolated from the seeds (which are sweetish) two alkaloids, *loliine* and *temulentine*, and *temulentic acid*. Loliine is a volatile base, and temulentine is a decomposition product

of temulentic acid. Hofmeister [19] disagrees with Antze. He says that the active principle is a crystalline base, temuline, $C_7H_{12}N_2O$ (0·06 per cent.), which he considers is present only in seeds infected by fungi. Temuline is narcotic and mydriatic, the latter action being due to paralysis of the oculo-motor peripheral nerve endings. Antze found that temulentine and temulentic acid produce a pure paralysis of the brain, spinal cord and heart nerves, and sometimes vomiting, and loliine a somewhat similar action. In addition, these substances apparently produce gastro-enteritis. Pammel [3] on the other hand, agrees with Hofmeister that the poisoning is due to a fungus, but states that the active principle is a *glucoside* loliin. Tschirch [20] records that Claviceps purpurea (Ergot) has been known to occur on this plant. Kobert [21] gives a complete account with bibliography. Recently Steyn [22] performed feeding tests with the seeds on rabbits, and found that a dose of 200 grm. of healthy seed produces no effect. Willmot and Silberbauer [24] record four recent cases of chronic poisoning in man in South Africa, probably due to the presence of drabok seed in household meal. It is apparent that this plant requires further investigation.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1125, 1166, 1349, 1367, 1486.
2. J. Medley Wood: Natal Plants, 1904, ii, Plate 108; 1908, v, Plate 463.
3. L. H. Pammel: Manual of Poisonous Plants, 1911, 4, 72, 74, 103, 344, 361, 826.
4. F. W. Semmler and B. Zaar: Ber., 1911, xliv, 460, through Chem. Abs., 1911, v, 1762.
5. W. R. Dunstan and T. A. Henry: Chem. News, 1901, xxvi, 84; 1902, lxxxv, 301.
6. M. Henrici: 11th and 12th Rpts. Dir. Vet. Educ. Res., Union of South Africa, 1926, i, 496, 497.
7. E. P. Phillips: Botanical Survey of South Africa, Memoir IX, 1926, 15.
8. R. Marloth: The Flora of South Africa: A Dictionary of the Common Names of Plants, 1917, 5.
9. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1912, 209.
10. Bull. Imp. Inst., 1922, xx, 300.
11. D. G. Steyn: J. So. Afr. Vet. Med. Ass., 1928, i (2), 47.
12. H. H. Curson: 13th and 14th Rpts. Dir. Vet. Educ. Res., Union of South Africa, 1928, i, 205.
13. A. Sanson: J. de l'Anat. et de Physiol., 1883, 113, through ref. No. 21.
14. J. H. Harvey-Pirie: J. Med. Ass. So. Afr., 1928, ii, 374.
15. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 14, 40.
16. L. H. Walsh: South African Poisonous Plants, Cape Town, 1909, 24, 25.
17. D. Hutcheon: Rpt. Colonial Vet. Surg. for 1894, Cape of Good Hope, G. 42—1895, 10.
18. P. Antze: Arch. f. exp. Path. u. Pharm., 1891, xxviii, 126.
19. Fr. Hofmeister: Arch. f. exp. Path. u. Pharm., 1892, xxx, 203.
20. A. Tschirch: Handbuch der Pharmakognosie, 1923, iii, 140.
21. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (2), 1009, 1013.
22. D. G. Steyn: 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 793.
23. J. Burtt-Davy: Transvaal Agr. J., 1905, iii, 297.
24. F. C. Willmot and S. F. Silberbauer: J. Med. Ass. So. Afr., 1931, v, 370, 381.
25. J. F. V. Phillips: Private Communication.

V. CYPERACEAE

The Zulus chew portions of the root of **Cyperus esculentus L.,** Uintjie or Euntjie, Hoenderuintjie, Zulu *inDawo*, for the relief of indigestion, especially when this condition is accompanied by foul breath. Zulu girls, with a view to hastening the inception of menstruation, eat porridge in which a handful of the boiled roots has been mashed (Bryant). The tubers are used as a vegetable in Southern Europe and Northern and Southern Africa, and, after roasting and grinding, as a substitute for coffee and cocoa.[1] They contain fatty acids and 12 per cent. of sucrose and starch.[2] Power and Chesnut [3] isolated 28·9 per

cent. of oil from the tubers which contain no alkaloid, caffeine, or asparagine. It is evident that their value is dietetic rather than medicinal.

The Kxatlas inject into the rectum a mixture of the powdered root of **Cyperus sexangularis Nees.,** Watergrass, Biesiesgras, Matjiesgoed, Pedi and Kxatla *mothlathla*, and the backbone of crocodile for lumbago and other forms of backache. The Shangaans sprinkle a watery extract of the root over men about to go into battle. The Zulus use the powdered roots, with those of an unidentified plant, in water, as an enema for children suffering from stomach troubles.

The Zulus prepare an enema from the tuber of **Cyperus longus L.,** Zulu *inDawo* (?), *mlabie* (Filabusi, Southern Rhodesia), for children with stomach troubles. They also blow the powdered tuber into the nose and ears for colds and other troubles in these regions, and the tuber may be chewed for the same purposes. The Assistant Native Commissioner at Filabusi informs us that the juice of the plant is regarded as being very poisonous, and is said to burn the skin when applied to it.

The Sutos believe that inhalation of the smoke from burning **Cyperus fastigiatus Rottb.,** Suto *mothôtô*, relieves pains in the side.

The Xosas use the pared knobs from the roots of a **Cyperus sp.,** Xosa *inDawa*, as a tonic, and also in violent colic. The knobs are chewed and swallowed. Smith states that they are aromatic, pungent, and bitter.

The Zulus use the roots of a **Cyperus sp.,** Bulrush, Zulu *iBhuma*, as a remedy for impotency and barrenness, mixed with the roots of either **Capparis corymbifera** or **Solanum sodomoeum.**

The Sutos use **Pycreus umbrosus Nees.,** Suto *motawatawanewa-didiba*, as a medicine for chest colds. The rhizomes are scented, and are used by the Sutos to put among clothes.

Phillips records that **Scirpus cernuus Vahl.,** Suto *leshomokxoane*, is ground up with a locust by the Sutos to make a medicine for sick children, and that they make a colic remedy from **Scirpus paludicola Kunth.,** Suto *rôrôruana*.

Pycreus umbrosus Nees., Scirpus corymbosus Heyne, and **Carex cernua Boott.,** are suspected of being one of the causes of "Vlei Poisoning"[4] (see Sium : Umbelliferae).

REFERENCES

1. A. Tschirch : Handbuch der Pharmakognosie, 1923, iii, 409.
2. Bull. Imp. Inst., 1924, xxii, 74.
3. F. B. Power and V. K. Chesnut : J. Agr. Res., 1923, xxvi, 69, through Chem. Abs., 1924, xviii, 408.
4. A. O. D. Mogg : So. Afr. J. Sci., 1927, xxiv, 269.

VI. PALMAE

The Tongas make an intoxicating drink by fermenting the sap of **Phoenix reclinata Jacq.,** Feather palm, Wild date-palm, Zulu *iSundu*, and of **Hyphaene crinita Gaertn.,** Fan palm, Gingerbread tree, Zulu *iLala*, Tonga and Shangaan, nnala (Stevenson-Hamilton). Unfermented, the sap is harmless and tastes like flat ginger beer (Stevenson-Hamilton). The fermented preparation may be compared with the toddy of India.

VII. ARACEAE

Wicht records that Europeans use the root-stock of **Acorus calamus L.,** an introduced species known as Sweet flag, Myrtle flag, Sweet sedge, Kalmoes, as a carminative. It is apparently also used as a diarrhoea remedy. The rhizome has a strong, fragrant odour and a warm, bitterish, pungent, aromatic taste.[3] All parts of the plant contain a *volatile oil*: leaves 0·2 per cent., fresh root 1·5 to 3·5 per cent.[3] It contains also a bitter, liquid glucoside, *acorin*, $C_{36}H_{60}O_6$, yielding, on hydrolysis, *oil of calamus*.[3] By oxidation of acorin a neutral resin, *acoretin*, is obtained. An alkaloid, *calamine*, has been isolated from the plant after the removal of acorin.[3]

In Europe the rhizome is used as an aromatic, and oil of calamus in perfumery. In Ceylon and India the powdered root is used as an anthelmintic and insecticide.[3]

Zantedeschia aethiopica Spreng., formerly known as Richardia africana Kunth., Arum lily, Calla, Pig lily, White arum, Trumpet lily, Lily of the Nile, Egyptian lily, Varkblom, Varkblaar, Suto *mothêbê*, is used medicinally. The Xosas and Europeans, after warming a fresh leaf for a moment on hot ashes, apply it to sores and boils. This preparation is said to be very soothing to insect bites. Wicht thinks that the leaves, when applied to wounds, act mechanically, *e.g.* like oiled silk, by preventing evaporation and so keeping the wound moist and stimulating granulations, an explanation with which we agree. Pappe states that the early colonists were in the habit of making a similar application to parts affected with gout and rheumatism, the pain of which, he thought, was relieved by the leaves producing local perspiration. Smith records that the "juice" is poisonous, and states that a small portion of the root, if swallowed, produces swelling of the tongue and throat, though Phillips finds that the Sutos, in spring, use the cooked young leaves and petioles as a vegetable. Bernhard Smith [1] states that the active principle is an "acrid juice." Marloth,[2] on the other hand, quotes Lewin as stating that the leaves contain no active principle, but that the injurious effects of the plant are due to the presence of large numbers of *raphides* of *calcium oxalate*, which irritate the mucosae.

Zulu women take a decoction of the roots of **Zantedeschia hastata Engl.,** formerly known as Richardia hastata Hook., Zulu *inTebe*, when they have repeated miscarriages, and to prevent the continuance of giving birth to weak, small babies. Bernhard Smith [1] states that the plant has an "acrid juice."

The Sutos rub the ashes from burning the rhizomes of **Zantedeschia albomaculata Baill.,** formerly known as Richardia albomaculata Hook., Suto *mohaladitwe*, over the body of a sick person who is *in extremis* (Phillips).

The Zulus drink a decoction of the roots of **Stylochiton natalensis Schott.,** Zulu *umFana-ka-hlanjani*, in diseases of the chest. Natives in the Barberton district use the roots as an earache remedy.

Bryant states that the Zulus use urine, in which the leaves of **Stylochiton sp.,** Zulu *umFana-ka-sihlanjana*, have been boiled, as an earache remedy.

REFERENCES

1. A. Bernhard Smith: Poisonous Plants of all Countries, 1923, 2nd Edition, 56.
2. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 14.
3. United States Dispensatory, 1926, 21st Edition, 1237.

VIII. BROMELIACEAE

The fruit of **Ananas sativa Schult. f.,** Pineapple, Pynappel, contains a digestive ferment *bromelin*, which is more nearly related to trypsin than to pepsin.[1] Toxic symptoms, resulting from the ingestion of the fruit, are reported from Hanoi, Indo-China,[2] though it is by no means clear whether the fruit only was at fault. The symptoms are heart failure, accompanied by cyanosis and patchy purple discoloration of the skin, and followed in serious cases by collapse and coma. Infusion of pineapple bark is said to be a successful antidote.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1430.
2. So. Afr. J. Sci., 1912, ix, 111.

IX. COMMELINACEAE

The Sutos use **Commelina africana L.,** Suto *lekxotswana*, *kxôpô-e-nyenyane*, *lekxôpšwana*, *kxôtswana*, Zulu *inDangabana*, crushed and cooked with **Haplocarpha scaposa Harv.** and an edible root (not determined) as a medicine for young women who are supposed to be barren. Phillips records that the Sutos use a decoction of this plant and **Tephrosia capensis** in the treatment of "weak heart" and "nervousness." The Ndebeles use a decoction of the root in the treatment of venereal diseases and as a medicine for women suffering unduly at the menstrual period. They sometimes also use it for pains round the hips and in bladder complaints. The Zulus use a cold infusion to bathe the body when a person (especially a child) is sleeping restlessly, and the leaves from the infusion are often rubbed over the sleeping place for the same purpose. Bowie states that the leaf is aperient.[1]

The Sutos prepare a medicine from **Commelina benghalensis L.,** Suto *khôtswana*, for treating barrenness in women (Phillips), and they use a decoction of the root of a **Commelina sp.**, Suto *kxôtswana*, for the treatment of stomach troubles.

Natives in the Oogies district of the Transvaal use a **Commelina sp.** as a purgative during pregnancy.

Zulu men administer **Cyanotis nodiflora Kunth.,** Wandering Jew, Zulu *inGongo*, Suto *kxôpô*, *theepe-badingwana*, powdered, as a "medicine" to their wives. It is supposed to cause disease about the genitalia of the women if they should subsequently have illicit intercourse.

REFERENCE

1. James Bowie, Comm. to So. Afr. Institution, 31st August 1829.

X. JUNCACEAE

Juncus effusus L. has been suspected of being one of the causes of "Vlei Poisoning,"[1] and other spp. Juncus are also apparently toxic to animals[2] (see Sium : Umbelliferae).

REFERENCES

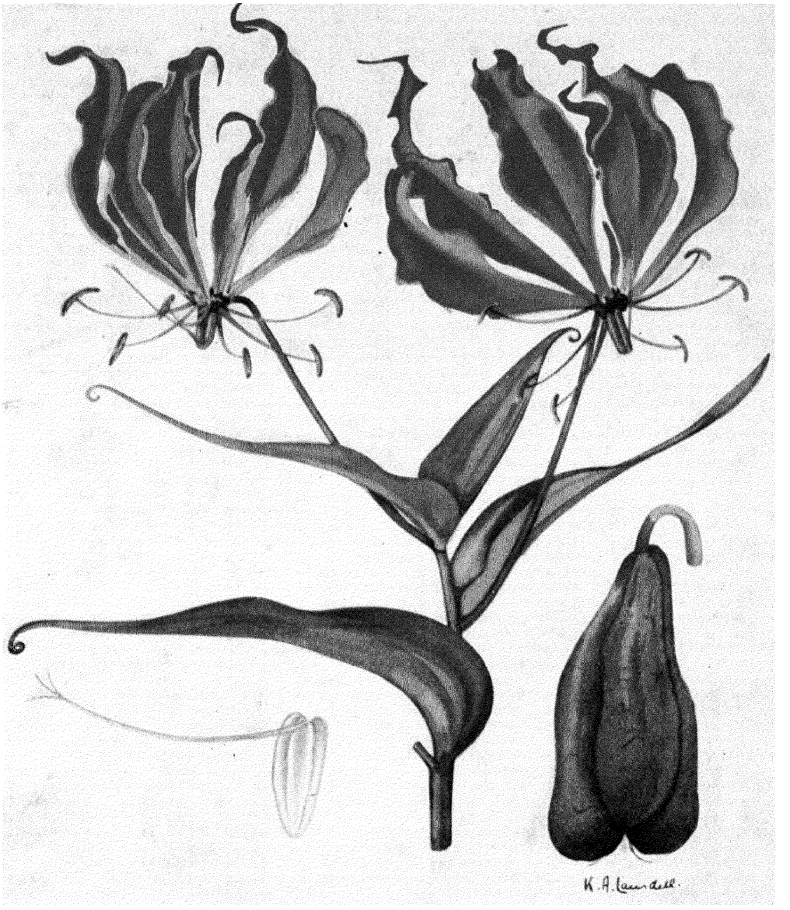
1. A. O. D. Mogg : So. Afr. J. Sci., 1927, xxiv, 269.
2. C. P. Neser : In discussion, J. So. Afr. Vet. Med. Ass., 1928, i, 50.

XI. LILIACEAE

According to Bryant, the Zulus drink in whey the powdered root of **Gloriosa virescens Lindl.,** Superb lily, Zulu *i Hlamvu*, Chopi *chicomane*, for the treatment of impotency and barrenness, and take the root under the name of *i Hlamvu-lomfana-nentombazana* to determine the birth of a child of a desired sex. The root is said to be very poisonous,[1] which statement is confirmed from Portuguese East Africa. There, two natives have died with diarrhoea from taking an infusion of the root medicinally.

Gloriosa superba L., Superb lily, Turk's cap, Climbing lily, Chopi *pembekushe*, Tonga *nyamahlokane*, which occurs in South Africa, is also said to be poisonous. In India and Ceylon the flowers are used for religious purposes and the tubers in promoting labour pains and in procuring abortion. Pammel states that the plant is a violent emetic, and that the tubers, when eaten, cause death within four hours. The United States Dispensatory [2] mentions that the roots, stalks, and leaves act as an acrid narcotic poison, and are not infrequently used for suicidal purposes in India. Scott [5,6] states that the symptoms of the poisoning are tingling, and then numbness of the lips, tongue, and throat, burning pain in the stomach, and numbness of the skin in various parts of the body ; intense nausea followed by vomiting, and diarrhoea with blood ; giddiness, loss of power in the limbs, heaviness of the eyelids, and photophobia ; respiratory embarrassment ; a feeble, quick pulse ; convulsions and loss of consciousness. *Post-mortem* examination reveals congestion of the gastric mucosa and of other viscera.

Warden [3] isolated from the root a neutral bitter principle *superbine* which is toxic, and which he regarded as being either identical with, or very nearly related to, the bitter principle of squill. He isolated from the root three *resins*, a *fluorescent principle*, and *salicylic acid*. More recently, Clewer, Green, and Tutin [4] have isolated direct from the tuber an *enzyme* and an alkaloid. An alcoholic extract of the dried tuber, on the other hand, yielded various organic acids, *choline*, *dextrose*, a hydrocarbon, a fatty alcohol, a mixture of *phytosterolins*, a mixture of alkaloids, chiefly *colchicine* (0·3 per cent. of the tubers), and small amounts of two other crystalline bases. They state that the pharmacological action of the main alkaloid, colchicine, is identical with that of colchicine from Colchicum autumnale. Colchicine, given by the mouth or



GLORIOSA SUPERBA L.

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injected subcutaneously, produces vomiting and diarrhoea accompanied by nausea. These symptoms are probably due mainly to gastro-intestinal irritation, though Dixon and Malden [5] think that part of this effect is due to a stimulating action of the principle on the motor nerve mechanism of the gut, similar to the action of pilocarpine. Colchicine apparently produces no effect on the nervous mechanism of the internal glands, or of the heart. In addition to the above-mentioned immediate action, the alkaloid produces, after a latent period of several hours, a progressive paralysis of the central nervous system which ultimately involves the respiratory centre and causes death by asphyxia. Lippmann [6] has isolated from the young leaves *chelidonic acid*, but the significance of this is not known.

The Sutos use **Androcymbium melanthioides Willd.,** Bobbejaanskoen, Patrysblom, Suto *kxukxwana-e-nyenyane*, *metsane*, along with **Polygala spp.,** as a medicine in many diseases (Phillips). They also use the plant as a charm to stop the advance of the enemy during war time. Bowie [46] states that the bulb of this species and of **Androcymbium eucomoides Willd.** is toxic to crows. The dried bulb of **Androcymbium longipes Bkr.,** Suto *kxukxwana*, is made by the Sutos into an ointment for sore ears (Phillips).

Bowie [46] states that the bulbs of **Androcymbium leucanthum Willd.** (Melanthium capense Linn.), **Baemetra columellaris Salisb.** (Melanthium uniflorum Jacq), **Dipidax ciliata Bkr.** (Melanthium capense Willd.), its variety **Secunda Bkr.** (Melanthium secundum Desv.), **Dipidax triquetra Bkr.** (Melanthium junceum Jacq.), and **Wurmbea capensis Thunb.** (Wurmbea campanulata Willd.) are toxic to crows.

Ornithoglossum glaucum Salisb. (Ornithoglossum viride Ait.), Cape slangkop, Karo slangkop, is very poisonous, and causes annually a considerable loss of stock.[7] The earliest record which we have found is a note by Bowie [46] that the bulb is toxic to crows. Animals poisoned by this plant show symptoms in from six to eighteen hours, and the illness lasts from six hours to two or three days. In slight cases the beast loses appetite, ceases to ruminate, has abdominal pain, and becomes dull. In more severe cases the animal shows great depression, staggers, and has marked abdominal pain and tympany. Later, diarrhoea is a prominent symptom.[7] Walsh [8] describes similar symptoms, and says that continual purging is a constant feature of the poisoning. *Post mortem*, the intestines are inflamed. The Imperial Institute [9] has published some data on the chemical composition and action of this plant, but a recent letter from the Director informs us that the material therein reported upon was really **Urginea burkei Bkr.** (Transvaal slangkop). In this connection it is interesting to note that Steyn [53] administered 65 grm. of fresh leaf, flower, and unripe seed to a rabbit on each of two consecutive days without toxic result.

Bowie [46] states that the bulb of **Ornithoglossum glaucum Salisb.,** *var.* **undulatum Bkr.** (Ornithoglossum undulatum Spreng.), is toxic to crows.

Bulbine asphodeloides R. and S., formerly known as Bulbine caespitosa Bkr., Snake flower, Copaiba, Balsem, Wilde kapiefa, Kopiefa, Geel-katstert, Suto *khomo-ya-ntsuka*, *mmele*, *sehlare-sa-pekane*, *sehlare-sa-mollo*, Fingo *iYezalehashi*, Xosa *inTelezi*, Zulu *iBhucu*, is widely used as a medicine among

Europeans and Natives. The juice expressed from the leaves and stalks is applied to wounds, ringworm, and gravel-rash, in the same way as tincture of iodine. It is said to produce very good results, and stains the skin brown. The wound smarts when the application is made. The Sutos use the crushed leaves as a dressing for burns, and the juice as an application for cracked lips. Smith states that the Xosas used the juice as a styptic. A decoction or similar preparation of the bulb and root is frequently used internally. Suto women take such a decoction for venereal diseases. Fingos and Xosas use it as a mild aperient in stomach upsets. The decoction is said also to act as a urinary antiseptic and demulcent when taken internally. The plant, boiled with Beukebossie (Lippia scaberrima Sond. (?)), gives a red dye. Four hundred grams weight of fresh root, leaf, and flower was drenched to a sheep without deleterious effect.[10]

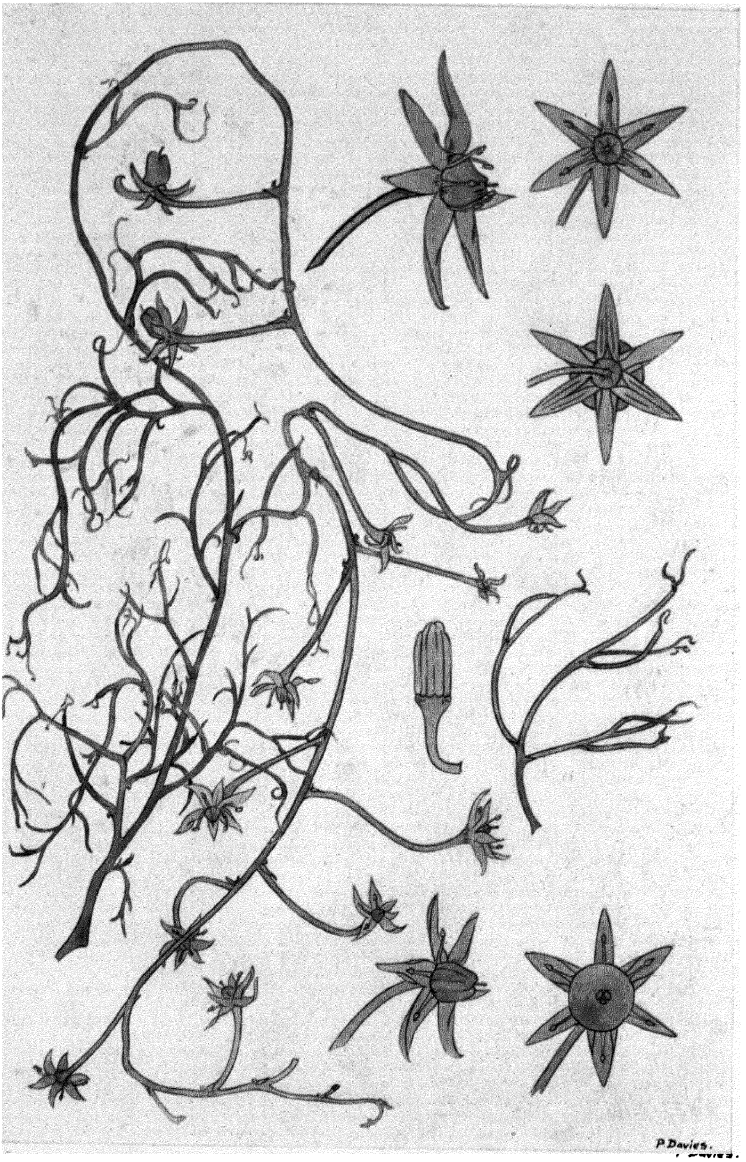
Bulbine alooides Willd., Rooiwortel, Xosa *inGelwane*, is used by Europeans, Xosas, Fingos, and Hottentots in the treatment of diarrhoeas, dysenteries, and abdominal complaints generally. For this purpose a decoction of the dried root is taken in large doses, frequently prepared with the addition of the leaves of **Monsonia ovata Cav.** A brandy tincture of the root is sometimes used. The plant is also thought to be a "blood-purifier." In this connection Smith states that the Xosas use it in the treatment of rheumatism, and he ascribes its beneficial effects to its "blood-purifying properties." He states, further, that overdosage with the plant results in diarrhoea, though small doses are constipating. Rindl[11] mentions that the plant has been tried by critical medical men with good results. We can find no published account of this work.

The natives of the Transkeian territories take a decoction of the dried root-stock of **Bulbine latifolia R. and S.,** Xosa *i Nacelwane*, internally in the treatment of rheumatism and blood disorders. We understand that the late Dr Soga, of Elliotdale, used it extensively in his practice. Smith states that the tuber is efficacious in lumbago, and that the root-stock yields an excellent carmine dye. He mentions also that the plant was used by the Xosas in place of Bulbine alooides Willd. in the treatment of rheumatism. Natives use a decoction of the root and stalk for the treatment of miscarriages.

Bulbine narcissifolia Salm-Dyck., Snake flower, Kopiefa, Wilde kopiefa, Suto *khomo-ea-bašemane*, Griqua *tlorutloru*, is much used as a medicine by Europeans, Sutos and Griquas. In the Transvaal, Europeans apply the fresh sap to wounds to hasten healing. The application produces smarting. In East Griqualand they use the sap as a wart and corn remedy. Barren Suto women who wish to become pregnant drink a decoction of the root, and similar treatment is given to cows (Phillips). The Griquas apply the sap to ringworm, gravel-rash, and wounds, while they take a root decoction for the relief of rheumatism, and a cold infusion of the fresh leaf as a purgative.

Bulbine rostrata Willd., Suto *seredilenyana*, is smoked by the Sutos for cold in the head (Phillips).

From Peddie we are informed that Europeans use **Bulbine sp.,** Wild onion, by rubbing the affected part with the leaves or by applying a poultice of the leaves, for the relief of rheumatism and sciatica.



Bowiea volubilis Harv.

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A decoction of **Anthericum sp.,** Suto *lelwelana*, is a Suto hysteria remedy.

Smith and Hewat record that the Xosas administer to new-born infants, as a purgative, a cold infusion of the tuber of **Chlorophytum comosum Bkr.,** formerly known as Hartwegia comosa Nees., Xosa *uJejane*, *uJiyane*. It is a favourite purgative among natives, especially for children. Walker [12] states that a similar preparation is used by natives as a medicine for women immediately after childbirth.

The bulb of **Bowiea volubilis Harv.,** Xosa *uMagaqana*, has for long been known to be poisonous. It is used by the Fingos, Pondos, and Bacas as a purgative, by roasting thoroughly, grinding, and mixing with hot water (two or three cupfuls to a bulb). A tablespoonful of this is taken as a dose. The action as a purgative is said to be mild, but overdosage and improper preparation produce poisoning. The Xosas use the bulb fresh from the ground as a dropsy remedy, and in the treatment of barrenness in women. We are informed that it is excellent for both. In the Transvaal, natives rub the juice of the bulb into the skin of sick people, and use a decoction of the bulb as a lotion for sore eyes. In former days the decoction was used by "witch-doctors" to sprinkle on "impis"; this was supposed to cause their enemies to flee before them.

The bulb has constantly cropped up in the courts as a cause of poisoning, usually through overdose during its administration by native herbalists to patients. Walker [12] records cases where the symptoms were vomiting and purging; one case died in two and a half days, while another died in three hours. The latter showed, *post mortem*, congestion and irritation of the gastro-intestinal tract, stoppage of the heart in diastole, and engorgement of the liver and other organs. Walker isolated *resinous bodies* from the bulb but no alkaloids. Juritz [13] records further cases of poisoning in man and animals, where the symptoms were vomiting, purgation, depression, salivation, irregularity of the heart, and cramp-like pains. He isolated from the bulb an *acrid substance*, having marked emetic and irritant properties. Phillips [14] mentions that sheep and goats fed on the plant die of gastritis. Lewis,[15] working with bulbs from Matabele, East Griqualand, isolated a highly toxic impure *alkaloid*. (For details of the method of isolation, see reference 16.)

Meltzer [16] has investigated the action of an infusion of the bulb and of Lewis's alkaloid. One hundred cubic centimetres of infusion was prepared from a decorticated bulb, weighing 45·59 grm. The minimum lethal dose of this infusion for cats is 2·5 to 3 c.c. per kilo by the stomach tube. The minimum lethal dose of the alkaloid for cats is 0·00028 grm. per kilo by the stomach tube. Vomiting is the most marked feature of the action. The heart and respiration rates are slowed, particularly the latter. Purging, urination, and salivation are also seen. With sub-lethal doses there is always vomiting and cardiac slowing, and the cat is drowsy and depressed for twenty-four to forty-eight hours after recovery. With lethal doses the respiration, after a preliminary slowing, becomes later very rapid, and of a shallow, panting character. The heart becomes very slow and irregular. Death occurs, with convulsions, in a few hours.

Meltzer is of the opinion (1) that the vomiting and purgation are due either

to a stimulating action of the alkaloid on smooth muscle or to an action on the central nervous system, more probably the former, as the muscular action is seen on the bladder as well as on the stomach and intestine ; (2) that the bulb is a cardiac poison ; (3) that death is probably due to cardiac failure ; and (4) that the *post-mortem* findings do not suggest irritant poisoning.

Curson [17] records that the above-ground parts of the plant are toxic to sheep and goats. A cold infusion was given by the mouth and produced death in two to three days, apparently without symptoms. Unfortunately, the observations were limited to one goat and one sheep. *Post mortem*, both showed irritation of the gastro-intestinal tract. There appears thus to be some difference in the effects of the bulb and of the above-ground parts. Further investigation is necessary.

Pappe records that the tuber of **Eriospermum latifolium Jacq.**, Bobbejaansoor, Olifantsoor, is " muculent," and was used by the early colonists as an external application to abrasions and superficial ulcers. He mentions that the Cape Mohammedans administered a decoction to women with amenorrhoea.

The Zulus use the tubers of **Eriospermum sp.**, Zulu *sulansula* (?), as a medicine to " doctor " regiments so that they will be protected from death and disaster. The plant is said to be emetic.

An aqueous preparation of **Eriospermum sp.**, Suto *lemmatlana*, and another plant, is administered by the Sutos to children suffering from gastro-intestinal complaints.

A decoction made from the crushed bulb and root of **Kniphofia alooides Moench.**, Red-hot poker, Vuurpyl, Zulu *iCacane*, is used by the Zulus as an enema in painful menstruation. The Sutos drink a decoction of **Kniphofia sarmentosa Kunth.**, Suto *lelwele*, *lelole*, to relieve pains in the shoulders. The plant also enters into the initiation rites of women (Phillips).

Zulus and Europeans use a cold infusion of the leaves of **Aloe saponaria Haw.**, White-spotted aloe, Soap aloe, Zulu *iCena*, Xosa *iNocelwane*, in the treatment of " blood scours " in calves, and of enteritis and indigestion in fowls. It is said to be excellent in both cases. The Zulus also make use of this preparation for raising the hair on hides preparatory to tanning. Natives in the Transkei use the plant in the treatment of wounds. Smith states that the Xosas simply cut open a leaf and apply the cut surface to the wound. Smith and Hewat both record the use by natives of the leaf pulp and yellow juice as an application to ringworm. The former says this is efficacious.

The Zulus administer a decoction of the leaf of **Aloe aborescens Mill.**, Zulu *inKalane*, to women just before parturition in order to assist the process. A cold infusion is used as a drench in the treatment of sick calves. Tschirch [18] states that the plant is one of the possible sources of commercial aloes in South Africa, and the United States Dispensatory [2] mentions that it is said to be one of the aloes which have been cultivated for the production of Barbados aloes.

The Zulus think that the smoke from burning leaves of **Aloe cooperi Bkr.**, Zulu *isiPhuthumane*, allowed to pervade the cattle kraals, will protect the cattle from the ill effects of eating improper food, *e.g.* too many dried mealie

stems or frost-bitten pumpkin shoots. The Zulus cook the flowers and eat them as a vegetable.

The Zulus also use **Aloe macracantha Bkr.,** Zulu *iCena*, Pedi *sekxôpha*. The leaves, after cutting off the thorns, are crushed and steeped in water, and the water used as an enema to clean out the intestine after taking a purgative medicine. They also grind up the flowers and steep the powder in water, which is given to children, either by the mouth or as an enema, for the treatment of feverish colds.

The Fingos use a decoction of a small quantity of the roots of **Aloe tenuior Haw.,** Fingo and Xosa *iKhalana*, Fingo *inTelezi*, as a remedy for tape-worm infection. It is said to be efficacious and safe. The preparation is also purgative. Smith and Hewat state that the Xosas and other native tribes use the plant for a similar purpose.

The Fingos and Gcalekas apply the leaf pulp of **Aloe latifolia Haw.,** Fingo, Xosa, Gcaleka *inGcelwane*, Suto *lekxala-la-thaba*, to boils and sores, and to injuries where inflammation has set in. It is stated to produce speedy relief. In earlier times the juice of the leaves was used in tanning skin robes and shirts, but on account of the adoption of European clothing, this use is not now often seen. Smith mentions similar uses, and also that the leaf pulp and yellow juice are applied to ringworm by the Xosas. Hewat records a similar method of use in wounds. Phillips states that the Sutos burn, crush, and boil the plant, and sprinkle the mixture round the village as a charm against lightning. To stamp out an epidemic of colds (influenza (?)), all the inhabitants of the village must bathe in public in an infusion of the plant. The Sutos also place the ash from burnt leaves in the ground under a broken limb in an animal to hasten union.

The Zulus use a sp. of **Aloe,** *probably* **Aloe marlothii A. Berg.,** Zulu *um Hlaba*, *iKhala*, in the treatment of round-worm infections. A decoction of the green leaf and root is drunk, or given as an enema. The ash of the leaf is mixed with tobacco in making snuff. Zulu women rub the green leaf pulp over the breasts in order to hasten the weaning of children. Natives, in general, drink a decoction of the shoots for stomach troubles. The preparation is said to cause vomiting when taken in large amount.

Aloe marlothii A. Berg. appears to be one of the sources of Natal aloes, and contains the active principle *nat-aloin*, $C_{16}H_{18}O_7$,[19] an *oxymethylanthraquinone* derivative. **Aloe candelabrum Berger** is also an important source of Natal aloes.[20]

Pijper states that in the Transvaal **Aloe variegata L.,** Bontalwyn, Kanniedood, is infused in brandy and taken for the relief of haemorrhoids.

Aloe plicatilis Mill. and **Aloe africana Mill.** are sources of Cape aloes.[18, 21] Kobert [22] states that they contain *oxymethylanthraquinone* derivatives.

Aloe ferox Mill., Alwyn, Kanniedood, Suto *hlaba*, *lekxala-la-quthing*, *um Hlaba* (by natives generally, but Smith gives the name to A. ferox, *var.* supralaevis), appears to be the most important source of Cape aloes.[19] The plant has been in common use in South Africa, especially in the south and east of the Cape Province, for many years. The inspissated juice of the leaf is used as a purgative for both man and beast. Hewat says that it is frequently

mixed with meal or clay for this purpose, though it is often given alone. The fresh leaf juice is much valued by natives as a direct application to the eyes in ophthalmia, and Smith states that the leaf juice of *var.* supralaevis is similarly used by the Xosas, Sutos, and Zulus. Smith also records that the juice is applied by natives to sheep for the treatment of scab. Xosa children are fond of sucking the sweet juice out of the flowers, and if this is done to any extent, it is said to produce a persistent weakness of the joints (Smith). The nectar juice is said to be narcotic. According to Bryant, the Zulus apply a decoction of the leaves to venereal sores. The juice has been recommended for freeing stock from ticks, but experimental internal administration and spraying proved useless.[47]

Tschirch [23] states that Cape aloes or ferox aloes contain *cap-aloin* or *ferox-aloin* which, he thinks, differs from barb-aloin, the ordinary aloin of commerce. Aschan [24] gives the formula $C_{16}H_{18}O_7$ to cap-aloin, and states that Cape aloes also contain *emodin*, $C_{15}H_{10}O_5$, and a resin. The resin is an ester of paracumaric acid with a specific resino-tannol. Tschirch [18] seems to have altered his opinion later, for he now states that ferox-aloin is identical with barb-aloin. He estimates that dry Cape aloes contain 16 per cent. of aloin, 59 per cent. of other oxymethylanthraquinone derivatives, and 18·8 per cent. of resin, the respective figures for the soft variety being 20, 55, and 13·2 per cent. Evers [25] agrees with Tschirch [18] that Cape or ferox aloes contain barb-aloin. More recently, Kiefer [26] gives the following composition for Cape aloes :—

1.	Two, possibly identical, very active, bright yellow resins, soluble in solution of sodium bicarbonate, each about . . .	30·0 per cent.
2.	Another very active resin, soluble in solution of sodium bicarbonate	6·8 ,,
3.	Aloin, slightly active	5·0 ,,
4.	Emodin, slightly active	1·5 to 1·8 ,,
5.	Water-soluble inactive substances . .	15·2 ,,
6.	Amorphous substances producing abdominal pain but not purgation	5·1 ,,

He thinks that the purgative action is due to the three resins, and that the aloin and emodin play a minor part in producing this effect.

Cape aloes is now an article of commerce, and takes its place on the market with Socotrine and Barbados aloes. At one time **Aloe ferox Mill.** was supposed to be the source of Natal aloes, but this is apparently not the case, as Marloth [20] thinks that **Aloe candelabrum Berger** is the true source. We have been informed by the late Mr G. E. Oliver, of Harding, that extensive inquiries show that aloes commercially exported from Natal were derived from Aloe ferox.

Suto women, who are barren, drink a decoction of the root of **Aloe kraussii Bkr.,** Suto *lekxalana, hlôhô-tsa-makaka, marôba-dihale,* to aid in the development of pregnancy. Should a woman become pregnant, she bathes herself with the

decoction during the pregnancy, at the confinement, and during the puerperium. A lotion made from the plant is used in the initiation rites of young Suto girls.

The Chuanas and Kwenas take a decoction of **Aloe davyana Schonl.,** Chuana and Kwena *kxôphane*, at frequent intervals during pregnancy, probably as a purgative.

Bryant mentions that the Zulus use a decoction of the roots of a species of **Aloe,** Zulu *uPhondonde*, in the treatment of painful menstruation accompanied by sterility. Some of the preparation is drunk and the remainder injected into the "uterus." He mentions also that the Zulus apply a pinch of the ash, obtained by burning the roots of Lasiosiphon sp. and the leaves of Aloe sp., to the eyes for ophthalmia.

Pijper says that a vinous extract of **Aloe sp.** is used in the Transvaal to produce abortion, and that fresh aloe sap is applied to the eyes for chronic conjunctivitis and blepharitis.

Natives use **Gasteria croucheri Bkr.,** *inTelezi*, *inTelezi-bululwane*, as a tonic, particularly in cases of paralysis. The method used is to pulp the leaves with cold water and to wash the body of the patient with the mixture. In the Mount Ayliff district, natives believe that rubbing the leaf juice on the skin will produce emesis.

In the Transkei, a decoction of the root of **Agapanthus umbellatus l'Hérit.,** Agapanthus, Blue lily, African lily, Haaklelie, Zulu *uBani*, *iCakathi*, *umHlambezo*, Suto *leta-la-phofu*, and the root of **Typha sp.** is taken by pregnant women from the sixth month. It is said to be mildly aperient and to ensure an easy childbirth. The child, also, is doctored with the same medicine before being put to the breast for the first time. Some natives use the root with the root of a small **Dianthus,** beaten up in cold water until it froths. In cases of severe abdominal pain (apparently colic), the liquid is used as a fomentation. The whole body may be washed in the same preparation for the relief of paralysis. Smith mentions similar uses among the Xosas. The Zulus use an infusion of the root in chest troubles. It is said to produce benefit in long-established coughs by an emetic action. Bryant says that the Zulus use a hot infusion of the root daily as an emetic in cases of serious heart disease. According to Phillips, the Sutos wash new-born babies with a lotion made from the roots in order to make them strong. Phillips [14] and Bernhard Smith state that the active principles are *scillitoxin* and *scillipiain*, but we have failed to trace the original publication upon which these statements are based.

The Transkeian natives use the bruised root of **Tulbaghia alliacea L. fil.,** Wild garlic, Wilde knoflook, Xosa *iVimba-'mpunzi*, Suto *moêlêla*, in preparing a medicated bath for the treatment of rheumatism and paralysis. They also use a similar bath for reducing the temperature in cases of "fever." Small doses may sometimes be taken as an aperient. Thunberg records that the early colonists used the bulb in cases of fever, either boiled in water or made into a soup. He states also that the root smells very strongly of garlic and "is reported to be a charm for serpents." Pappe says that the bulbs were recommended for phthisis and as an anthelmintic, as were also **Tulbaghia cepacea L. f.** and **Tulbaghia violacea Harv.**

The Sutos use a lotion made from cooked **Tulbaghia acutiloba Harv.,**

Suto *motsuntsunyane*, to wash incisions made on the child, and on the breasts of the mother in cases of depressed fontanelle (Phillips).

Tulbaghia dieterlenii Phillips, Suto *sefothafotha*, and **Pisosperma capense Sond.** enter into the composition of a decoction drunk by the Sutos to rid the body of a "snake" supposed to have been introduced by witchcraft. The former is sometimes used by natives to fortify snuff (Phillips).

The Xosas drink a decoction of the leaves and root of **Allium sativum L.,** Garlic, Xosa *iVimba-'mpunzi*, for fever. The preparation is sometimes made with the addition of **Fagara capensis Thunb.** and **Artemisia afra Jacq.,** and generally produces sweating. Garlic has been in very common use as a popular medicine since ancient times, and has still a considerable vogue. It is supposed that any action it possesses is due to the presence of volatile *oil of garlic*. Garlic oil, according to Semmler,[27] contains *diallyl disulphide*, $C_6H_{10}S_2$; *allyl-propyl disulphide*, $C_6H_{12}S_2$, and an unidentified higher boiling fraction. The oil has a specific gravity of 1·052, and occurs to the extent of 0·09 per cent. in the bulb. Lehmann[54] has reported the following data in regard to the oil: an inhibitory effect upon bacterial decomposition of tissues, lethal effect on Paramoecium caudatum, production of methaemoglobin from haemoglobin, ready absorption from the intestine, and excretion through the lung. He states, also, that the oil is destroyed by heat and is highly sensitive to oxidation and reduction. Impure garlic oil is very irritant and pungent,[2] and appears to cause an irritant type of poisoning when taken in excess.[22] Pammel agrees that it is irritant. Perrin, Dombray, and Vlaikovitch[28] state that "essence of garlic" is stimulant-narcotic in its action on all animals, and that 0·775 c.c. per kilo is toxic to rabbits. Rico[48] states that the plant is anthelmintic, and that preparations produce first a strong stimulation of *Ascaris lumbricoides*, followed by paralysis. He finds that the anthelmintic action is due to the diallyl disulphide content of the plant. Lio and Agnoli[55] find that extracts have the same effects upon smooth muscle as Rico[48] has recorded on Ascaris. They think that this is a factor in the production of the hypotensive action of garlic. The plant produces a depressing effect upon the heart, slowing the rate and lessening the muscular contractility (Agnoli and Lio[57]).

Albuca major L., Soldier in the box, Geldbeursie, Slymstok, Slymuintjie, Tamaraka, Vinkeiers, Suto *motôtse*, is edible and, according to Thunberg, the stalk is rather mucilaginous, and was chewed by the Hottentots as a thirst-quencher. The plant is used as a charm by the Sutos (Phillips).

The Sutos use **Albuca trichophylla Bkr.,** Suto *morotwana-phôôkwana*, in the treatment of gonorrhoea (*morotwana*), and a lotion of **Albuca cooperi Bkr.,** Suto *nkonko-phiri*, for washing wounds in animals. The latter is also used as a charm (Phillips).

Urginea burkei Bkr., Transvaal slangkop, Burke's slangkop, Gavu, Suto *sekanama*, has for long been known to be poisonous, and has often caused serious loss of stock, particularly in the spring in times of drought.[7, 8, 9, 29, 30] This is due to the fact that the green succulent flowering stalk appears above the ground when other vegetation is lacking, and starving animals are thus tempted to eat it.[19] The whole plant is toxic, bulb, leaf, and flowering top,[31] but it is stated that the toxicity disappears as soon as the flowers mature.[14] On the

other hand, it is recorded that the toxicity of the bulb is greatest just after flowering.[32]

The natives near Filabusi (S. Rhodesia) rub the bulb on the body for paralysis. Any benefit which accrues may arise from irritation of the skin, for the cut bulbs are highly irritant. The Sutos use an aqueous preparation of the bulb as an abortifacient, and in the treatment of circulatory diseases (Beyer).

Animals poisoned by Urginea burkei, after showing indefinite signs of general ill-health, develop diarrhoea, frequent micturition, muscular tremors, grinding of the teeth, and embarrassment of the heart's action. Later, the heart becomes feeble and slow, and the diarrhoea so marked as to cause the animal to subside through weakness. These symptoms may sometimes not appear until two days after ingestion of the plant. The duration of the illness is one to three days. *Post-mortem* examination reveals congestion and irritation of the kidneys, bladder, stomach, and intestine.[7]

The plant at one time was suspected of being a possible cause of gallamsiekte, but is now definitely known to have no connection with the disease.[33] Likewise it was suspected of causing krimpsiekte,[34] but this is now known not to be the case.

The Imperial Institute[9] found that the bulbs yielded a bitter glucosidal substance which, according to Cushny,[9] is intensely poisonous to frogs, rats, and cats, and has a digitalis-like action. Unfortunately, this work was published under the name of Cape slangkop (Ornithoglossum glaucum Salisb.), but the Director of the Imperial Institute, in a letter dated 17th October 1928, informs us that the bulbs were later determined as Urginea burkei Bkr. He informs us also that the bulbs have been tried as a raticide by the British Ministry of Agriculture and Fisheries, but were found to be useless on account of low toxicity.

Gunn [31] has shown that the bulb, leaf, and flowering top all have a typical digitalis action. George [32] has carried the matter a stage further by isolating two impure glucosides from bulbs collected just after flowering. One is red, the other colourless. Watt [35] found that George's red glucoside is highly toxic and has a digitalis action: he has not yet completely investigated the colourless glucoside on account of lack of material, but it is less toxic to cats than the red, and depresses the central nervous system.

Urginea macrocentra Bkr., Poison bulb, Natal slangkop, Zulu and Xosa *inJobo*, Zulu *uJobo*, is also a stock poison,[14, 36, 37] and apparently owes its toxicity to a principle which reduces Fehling's solution and gives some of the alkaloidal reactions.[38] Mitchell [36] has investigated the toxic effects of the plant in ruminants and finds that, after preliminary symptoms of indefinite ill-health, they develop a persistent tympanites accompanied by constipation. In acute cases, diarrhoea may be seen. Polyuria, thirst, and loss of appetite are constant symptoms, but there is rarely evidence of enteritis or colitis. The animals take four to fourteen days to die, and are usually comatose for a long time preceding death. Stent and Curson[7] state that the intestinal effects of this plant are more severe than those of Urginea burkei Bkr. and Medley Wood [37] that enteritis is always seen, but Mitchell's report does not support these views. The Zulus and Xosas use the bulb as an anthelmintic.

Urginea altissima (L. f.) Bkr., Maerman, is also toxic to stock,[7] the symptoms resembling those of Urginea burkei. Marloth [19] states that the bulb produces effects resembling those of Scilla maritima. Bernhard Smith gives *scillitoxin* and *scillipiain* as the active principles, but we have not been able to trace the original publication on which this statement is based. In the Cape Province the fleshy scales of the bulb are heated, and applied to gouty limbs (Wicht). The relief is probably due to the heat, but may be due to irritation.

Urginea capitata Bkr., Suto *moretele,* is toxic to sheep, producing gastro-enteritis. The plant is used as a charm by the Sutos. **Urginea sanguinea Schinz.** (Krimpsiekte-blaar) is highly poisonous.[7, 9, 19]

The bulb of **Drimia ciliaris Jacq.,** Jeukbol, Jeukui, is used as an emetic, expectorant (Marloth) and diuretic (Pappe). The bulb is highly irritant when handled, the irritation being produced by raphides of calcium oxalate (Marloth). Pappe mentions that the juice will even blister, and that **Idothea elata Kunth.** has the same properties as Drimia ciliaris Jacq. The burnt roots of **Drimia neriniformis Bkr.,** Suto *hlare-sa-nôkô,* are rubbed by the Sutos into external tumours which have been lanced (Phillips).

Decoctions of **Dipcadi polyphyllum Bkr.,** Suto *morotwana-phôôkwana,* **Dipcadi viride Moench.,** Suto *morotwana-phôôkwana, theledi-môro,* **Dipcadi umbonatum Bkr.,** Suto *morotwana-phôôkwana,* and another **sp.** of **Dipcadi** are Suto remedies for gonorrhoea. The bulb, Suto *lêta-laphofu,* mashed with water, is smeared on the skin of Suto children for the treatment of pimples.*

As a headache cure the Sutos rub a powder made from burnt **Litanthus pusillus Harv.,** Suto *kxôhô-ya-lefika,* into incisions on the forehead (Phillips).

The Sutos rub the powdered bulb of **Scilla natalensis Planch.,** Suto *kxêrêrê,* into scarifications, over sprains, fractures, etc. They eat the cooked bulbs with food as an aperient, inject a decoction of the bulb as an enema for " internal tumours," and use the plant as a medicine for cattle with lung sickness (Phillips). The Swazis use a hot lotion made by boiling the cut-up bulbs in water as an application to boils and veld sores.

Natives in the Piet Retief district use the bulb of **Scilla rigidifolia Kunth.,** Wild squill, Zulu *inGcino, inGcolo,* Suto for *var.* gerrardi Bkr. *lenaka-la-kxomo,* by mixing a lightly boiled decoction with fresh lukewarm milk and administering it to children as an enema in conditions of nervousness, etc. The Sutos administer the crushed bulb (*var.* gerrardi) in food as an aperient for children (Phillips). Bryant states that the plant is poisonous, and that the Zulus use small doses of a dilute decoction of the bulb in the treatment of rheumatic fever. Marloth [19] agrees that the plant is toxic, and states that it causes loss of stock. The plant does not show, as would be expected, a digitalis action, but the main effect is a marked and usually prolonged fall in the blood-pressure, followed sometimes by a rise above normal.[39] The authors state, however, that it may contain a digitalis body, the action of which is masked by some depressor substance.

According to Phillips, the Sutos use **Scilla inandensis Bkr.,** Suto *beôkhô,* **Scilla cooperi Hook. f.,** Suto *phetola,* and **Scilla galpini Bkr.,** Suto *phetola,* as

* **Dipcadi glaucum Bkr.,** Wild onion, Malkop-uie, is an irritant stock poison. (Steyn: J. So. Afr. Vet. Med. Ass., 1931, ii, 115.)

medicines for administration to women in the fourth month of pregnancy. They also give them to cows with the idea of ensuring a succession of calves of the same sex. The bulb of **Scilla cooperi Hook. f.** has a digitalis action, but is less active than Scilla maritima.[39]

The bulb of **Scilla lanceaefolia (Jacq.) Bkr.,** Wild squill, Suto *boĉkhwê*, Chuana *sejabaleki*, Chuana and Kwena *boxokxwê*, *dixwere*, Xosa *inQwebebane*, is stated to be used medicinally and to be expectorant, diuretic, and irritant to the gastro-intestinal tract (Wicht). The plant enters into the treatment of lumbago by Suto herbalists, but is not actually administered to the patient (Phillips). The Xosas use a decoction of the leaf for gall sickness in animals (Smith). The Chuanas use the bulb as a local irritant, and administer a decoction to women at the climacteric. The Chuanas and Kwenas use an infusion to bathe skin eruptions, and apply the burnt and powdered plant as an ointment for wounds and sores. The bulb has a digitalis action, but is less active than Scilla maritima.[39] Animals drenched with a decoction developed a slight cough, watering at the eyes, and reddening of the visible mucosae, but did not die.[14]

The bulb of **Scilla rogersii Bkr.** has also a digitalis action, the activity being equivalent to that of Scilla maritima.[39]

The Chuanas boil **Eucomis undulata Ait.,** Krulkop, Chuana *mothuba-difala*, Suto *kxapumpu*, Pedi *maphuma-difala*, Zulu *uMakhandaka-'ntsele*, with water, milk, or meat, and take the product for distension of the stomach. The Pedis take a decoction of the core of the bulb for the relief of abdominal pain.

The Zulus use the plant in the treatment of urinary diseases (Bryant). Both the Chuanas and the Sutos believe that the plant is a powerful charm against witchcraft and to inflict harm on one's enemies. The Sutos take a decoction of the bulb for the treatment of syphilis. The plant has been used by natives in the treatment of galsiekte and other diseases in domestic stock.[40] Gunn [40] has isolated a saponin from the bulb. This saponin has a strong haemolytic action and is not absorbed from the alimentary tract, and but slowly from the subcutaneous tissues. It is, however, toxic when injected intravenously. Given by the stomach to cats, it produces severe local inflammation, salivation, vomiting, and purging, apparently from irritant effects. When it is injected intravenously, the heart is slowed and weakened, the peripheral blood-vessels constricted, and there is a variable effect upon the blood-pressure, most usually a preliminary short fall followed by a rather prolonged rise. The respiration is slowed and weakened, and death results from paralysis of this function. The heart with suitable dosage becomes progressively weaker, and stops in diastole. The plant has probably no real medicinal value, but has been suspected of producing human poisoning.

The Xosas use the bulb of **Eucomis punctata l'Hérit.,** Krulkop, Xosa *ubuHlungu-becanti*, medicinally. They make a decoction by boiling the bulb with the root of *iPuzi-lukaxam* (undetermined). This is taken in table-spoonful doses three times a day for rheumatism, and is given as an enema to children when teething. The preparation is stated frequently to produce a rash. The Sutos use **Eucomis bicolor Bkr.,** Suto *kxapumpu-ya-thaba*, for the relief of colic (Phillips).

Ornithogalum thyrsoides Jacq., Chinkerichee, Chinkerinchee, Star of Bethlehem, Wit-viooltjie, Viooltjie, Tjienkerientjie (Ornithogalum spp.), is regarded as being very poisonous to stock, though some farmers maintain that the plant may be eaten with impunity. The Cape Agricultural Department has proved that all parts of the plant are toxic to stock, and that the seeds contain a much higher proportion of the poisonous principle than other parts.[8, 49, 50, 51, 52] It has been recorded as causing death in horses through accidental inclusion in forage.[41, 49, 50] Walsh [8] states that a poisoned animal shows first dullness, loss of appetite, and depression.[51] Severe purging comes on in about twelve hours and is usually persistent. The animal manifests signs of severe abdominal pain, and death is often preceded by convulsions. *Post mortem*, the signs are those of a gastro-enteritis.[51] Power and Rogerson [42] have isolated 4 per cent. of a *toxic resin* or *mixture of resins* from the whole dried plant, and state that it contains neither alkaloids nor glucosides. It contains also a small amount of *volatile oil*. Juritz [13] states that this poisonous resinous mixture yields a phytosterolin.

According to Pappe, the bulb of **Ornithogalum altissimum L.,** Maerman, is diuretic, and an oxymel was used as a demulcent in "catarrh, asthma, consumption, and hydrothorax." Kobert [22] states that the bulb has been sold in Europe for centuries as a squill substitute.

Curson [43] has shown that **Ornithogalum tenellum Jacq.** is toxic. He states that, like Ornithogalum thyrsoides Jacq., it is called Chinkerinchee. Hutcheon [44] called it Snowdrop. The symptoms and *post-mortem* findings resemble very closely those recorded under Ornithogalum thyrsoides Jacq.

Quin [45] has proved that the bulb of **Ornithogalum saundersiae Bkr.** is highly toxic when given by the mouth to several species of animals. It produces a gastro-enteritis, accompanied by polyuria and restlessness, followed later by depression. The diarrhoea is very severe, and produces a condition of anhydraemia. The pulse is rapid and there is dyspnoea. He found neither glucosides, nor alkaloids, nor phyto-proteins in the bulb, but has not yet isolated the active principle in a recognisable form. It is, however, extractible by alcohol. Alcoholic extracts of the leaves and stems, however, proved to be non-toxic.

Ornithogalum lacteum Jacq., in a fresh state, is toxic to sheep when administered by the mouth. Some twenty-four hours after the dose there develops a severe watery diarrhoea, accompanied by fever, tachycardia, quickening of the respiration, and severe abdominal pain. Death is by exhaustion. *Post mortem*, acute gastro-enteritis, hyperaemia and oedema of the lungs, subendocardial and subpericardial haemorrhages and general cyanosis are found.[10] **Ornithogalum aurantiacum Bkr., Ornithogalum caudatum Ait.,** and **Ornithogalum pretoriense Bkr.** (Ornithogalum eckloni Schltr.), tested in the same way, produced no effect.[10]

Sansevieria thyrsiflora Thunb., Pile root, Kafferwortel, Gcaleka, Fingo, Xosa, and Zulu *isiKholokhotho*, Eastern province *t'Kaij*, is widely used as a medicine among natives. The commonest use is to heat a cut leaf gently, and drop the juice which exudes into the ear for relieving earache. Some use it in a similar way for toothache. The Xosas, Fingos, and Gcalekas chew a portion

of the root and swallow the juice for the relief of haemorrhoids, and to expel intestinal worms. Sometimes a decoction of the root is drunk for the latter purpose. Pappe mentions that they ate the boiled root for haemorrhoids. The Zulus drink a cold infusion of the root as a protective charm when any member of their kraal has been struck by lightning. The fibres from the leaves are very generally used by natives in binding up fractures of the extremities. Hewat states that native women take an infusion of the root for the treatment of miscarriages.

The genus Asparagus is widely used in South African popular medicine. **Asparagus capensis L.,** Wild asparagus, Katdoring, Wag-'n-beetjie, **Asparagus stipulaceus Lam.,** Katdoring, Xosa *imVane*, **Asparagus plumosus Bkr.,** Feathery asparagus, Satisfaction, Katdoring, **Asparagus burkei Bkr.,** Katdoring, Filabusi *matundela* and **Asparagus striatus Thunb.,** Katdoring, all have a reputation in the treatment of tuberculosis of the lungs. An infusion of the root is taken in large doses several times a day. There is no real evidence that such treatment produces any benefit. The root of one of them, most probably A. stipulaceus, is actually marketed as a tuberculosis remedy by one enterprising individual.

A decoction of the root of **Asparagus burkei Bkr.** is drunk by natives in the Filabusi district (S. Rhodesia) for sore throat. In Southern Rhodesia, natives use the bark of **Asparagus stipulaceus Lam.** as an emetic and, according to Smith, the Xosas use it and its variety *spinescens* as a " blood purifier." In the Prieska district, Hottentot women drink the ground-up tubers of **Asparagus striatus Thunb.** in water after childbirth. The Zulus use an infusion or a decoction of the root of **Asparagus virgatus Bkr.,** Zulu *iPhingantloya*, made with the root of **Fagara capensis Harv.** and the root-bark of **Indigofera sp.,** as an anthelmintic for man and beast.

The root of **Asparagus laricinus Burch.,** Chuana and Kwena *lesitoane*, according to Pappe, is diuretic and was used in dropsy. He states that the urine after the administration has a peculiar odour. The smoke from the burning plant is used for diseases in females, and a decoction of the root drunk to induce pregnancy by the Chuanas and Kwenas.

According to Phillips, the Sutos use **Asparagus asiaticus L.,** Suto *leunyedi*, as a purgative for children who have colic as a result of suckling when the mother is pregnant. A decoction of the burnt and crushed root of **Asparagus scandens Thunb.,** Suto *kxopa*, is used to relieve colic and to cure a rash which is thought to appear after seeing a snake ; and the roots of **Asparagus medeoloides Thunb.,** Cape smilax, Suto *kxopananyana*, *sesclatsane*, in making a lotion for sore eyes, in both cases by the Sutos (Phillips). The Sutos also take a decoction of the root of the latter as a mild purgative.

A decoction of the root of **Asparagus stellatus Bkr.,** Suto *lelala-tau*, is administered by the Sutos to infants suffering from depressed fontanelle.

The Sutos administer a decoction of the root of **Asparagus sp.,** Suto *lelala-tau*, *leunyedi*, for the relief of backache, and the Fingos and other tribes in the Tsomo district give a decoction of the root of **Asparagus sp.,** Wild asparagus, Fingo *inGcelwane*, to women who do not conceive and who have at the same time abdominal pain. According to Bryant, the Zulus sometimes use a

decoction of the leaf and root of **Asparagus sp.**, Zulu *isiGobo*, in the treatment of pleurisy and pleurodynia. An **Asparagus sp.**, Roranga *rowahanga*, is added by the Rorangas to the porridge of epileptics.

Smilax kraussiana Meisn., Wag-'n-beetjie, Zulu *inGqagabulani*, *iYali*, *uLimi-lwenyathi*, is a minor Zulu remedy for ophthalmia. The eyes are held over the steam from a decoction (Bryant).

REFERENCES

1. J. Medley Wood: Natal Plants, 1906, 4, Plates 396, 399.
2. United States Dispensatory, 1926, 21st Edition, 100, 103, 1317.
3. —. Warden: Ind. Med. Gaz., 1880, xv, 253; 1881, xvi, 138, through ref. No. 4.
4. H. W. B. Clewer, S. J. Green, and D. Tutin: J. Chem. Soc., 1915, 107, 835.
5. W. E. Dixon and W. L. Malden: J. Phys., 1908, xxxvii, 50.
6. E. O. van Lippmann: Ber., 1920, liii, 2069, through Chem. Abs., 1921, xv, 696.
7. S. M. Stent and H. H. Curson: Union of So. Afr. Dept. Agr., Bull. vii, 1922, 3, 5, 6, 7.
8. L. H. Walsh: South African Poisonous Plants, Cape Town, 1909, 10, 31, 34.
9. Bull. Imp. Inst., 1915, xiii, 59, 258; 1916, xiv, 31, 37.
10. D. G. Steyn: 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 795.
11. M. Rindl: So. Afr. J. Sci., 1917, xiv, 58.
12. P. H. Walker: So. Afr. Med. Rec., 1914, xii, 140 (footnote), 141.
13. C. F. Juritz: So. Afr. J. Sci., 1911, viii, 100; 1914, xi, 112; So. Afr. Med. Rec., 1915, xiii, 319; Rpt. Chief Chemist (Cape Province) for 1910, U.G. 16—1912, 30.
14. E. P. Phillips: Botanical Survey of South Africa, Memoir IX, 1926, 20, 21, 22.
15. J. Lewis: Results published in ref. No. 16.
16. E. Meltzer: J. Med. Ass. South Africa, 1928, ii, 6.
17. H. H. Curson: So. Afr. J. Sci., 1928, xxv, 240.
18. A. Tschirch: Handbuch der Pharmakognosie, 1917, ii (2), 1422, 1433, 1436.
19. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 5, 15.
20. R. Marloth: Pharm. Act. Helvet., Jan. 1928, 10.
21. L. Pappe: Florae Capensis Medicae Prodromus, 3rd Edition, 1868, 40, 41, 42.
22. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (1), 540, 555; ii (2), 1212.
23. A. Tschirch: Apoth. Zeit., 1901, Nr. 78, quoted by Marloth, ref. No. 20.
24. J. Aschan: Arch. der Pharm., 1903, 241, 340.
25. N. Evers: The Chemistry of Drugs, 1926, 169.
26. H. Kiefer: Pharm. J., 1925, cxv, 384.
27. F. W. Semmler: Apoth. Zeit., 1906, 21, 987, through ref. No. 25, p. 182; Arch. Pharm., 1892, 434, through ref. No. 2, p. 100.
28. M. Perrin, P. Dombray, and M. Vlaikovitch: Comp. rend. Soc. biol., 1924, xc, 1431, through Chem. Abs., 1925, xix, 350.
29. J. Burtt-Davy: Ann. Rpt. to Sec. Agr., Cape of Good Hope, 1903-4, 310, Plates 17, 18, 19; Trans. Agr. J., 1904, ii, 96.
30. J. T. Dunphy: Trans. Agr. J., 1906, iv, 315.
31. J. W. C. Gunn: Trans. Roy. Soc. So. Afr., 1921, ix, 197; J. Dept. Agr., Union of South Africa, 1924, ix, 141.
32. E. George: J. So. Afr. Chem. Inst., 1925, viii, 14.
33. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 200.
34. R. Marloth: The Flora of South Africa, 1915, iv, 102.
35. J. M. Watt: Arch. f. exp. Path. u. Pharm., 1927, cxx, 65.
36. D. T. Mitchell: 11th and 12th Rpts. Dir. Vet. Educ. Res., Union of South Africa, 1926, i, 303.
37. J. Medley Wood: Agr. J., Union of South Africa, 1914, vii, 703.
38. C. F. Juritz: Chem. News, 1923, 126, 67.
39. J. W. C. Gunn, M. Goldberg, and J. H. Ferguson: Trans. Roy. Soc. So. Afr., 1925, xii, 1.
40. J. W. C. Gunn: Trans. Roy. Soc. So. Afr., 1921, x, 1.
41. D. Hutcheon: Agr. J., Cape of Good Hope, 1906, xxviii, 165.
42. F. B. Power and H. Rogerson: Pharm. J., 1910, lxxxiv, 326.
43. H. H. Curson: 13th and 14th Rpts. Dir. Vet. Educ. Res., Union of South Africa, 1928, 219.
44. D. Hutcheon: Agr. J., Cape of Good Hope, 1904, xxv, 48.
45. J. I. Quin: So. Afr. J. Sci., 1927, xxiv, 431.
46. James Bowie: Comm. to So. Afr. Institution, 31st August 1829.
47. R. W. Dixon: Rpt. Colonial Vet. Surg. for 1899, Appendix II, Cape of Good Hope, G. 35—1900, 38.
48. J. Toscano Rico: C. R. de la Soc. de Biol., Portugal, 1926, xcv, 1597.
49. W. Robertson: Rpt. Bacteriologist Agri. Dept., 30th June 1904, Cape of Good Hope, G. 41*—1904, 48.
50. C. F. Juritz: Rpt. Sen. Analyst, 30th June 1904, Cape of Good Hope, G. 59*—1904, 37.
51. R. Paine: Rpts. Chief Vet. Surg. and Assist. Vet. Surg., 31st December 1904, Cape of Good Hope, G. 60—1905, 8.

52. W. Robertson: Rpts. Chief Vet. Surg. and Assist. Vet. Surg., 1905, Cape of Good Hope, G. 47—1906, 62.
53. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 723.
54. F. A. Lehmann: Arch. exp. Path. u. Pharm., 1930, cxlvii, 245.
55. G. Lio and R. Agnoli: Arch. Internat. de Pharmacodyn. et de Thérap., 1927, xxxiii, 400.
56. H. H. Scott: The Practice of Medicine in the Tropics, edited by Byam and Archibald, London, 1921, i, 778.
57. R. Agnoli and G. Lio: Arch. Internat. de Pharmacodyn. et de Thérap., 1927, xxxiii, 251.

XII. AMARYLLIDACEAE

Haemanthus natalensis Pappe, Blood flower, Snake lily, April fool, Zulu *iDumbi-lika-'ntloyile, imPompo,* is poisonous. Juritz [1, 2, 21] has recorded deaths in natives from ingestion of the bulb, and has isolated from it 0·168 per cent. of yellow non-crystalline scales, which give some of the alkaloidal reactions. The substance is alkaline to litmus, very slightly soluble in water, highly soluble in chloroform, ether, alcohol, and dilute acids. It has a sharp, burning taste, followed by persistent bitterness, which is accompanied by salivation and nausea. He found that a decoction of the fresh bulb produces emesis and malaise in a dog, but no effects in rabbits. The active principle which he isolated produced similar effects in dogs, but none in the mouse. The Zulus use a decoction of the root as an expectorant and emetic in cough (Bryant).

Haemanthus puniceus L., King of Candia, is also poisonous, and has been recorded as causing the death of natives.[1, 2, 22] Juritz [2] has isolated 0·25 to 1 per cent. of an alkaloid from the bulb. This was found to be toxic to sheep, producing death, with very little in the way of symptoms.[22]

As far back as the eighteenth century Thunberg records the use of the bulb of **Haemanthus coccineus L.,** Blood flower, Paint brush, Mountain squill, King of Candia, April fool, Maartblom, Skoensolen, Veldskoenblare, Misryblom, Misrybol, Misryersblom, Miskruiersblom, Rooikwas, Poeierkwas, Zulu *iDumbi-lika-'ntloyile,* as a diuretic in dropsies and as an asthma remedy. Pappe mentions similar uses, and states that the fresh leaves were used as an antiseptic application to foul ulcers and anthrax pustules. The leaves have also been used to keep wound dressings moist (Wicht). Medley Wood states that the plant is poisonous.

Steyn [25] administered 500 grm. of fresh bulb and leaf of **Haemanthus amarylloides Jacq.** to a sheep which, as a result, died within twenty-four hours. The symptoms were salivation, quickening of the respiration, acceleration of the pulse, and diarrhoea. Later in the action, the animal was unable to rise, was bloated, and exhibited profuse salivation, lachrymation, and diarrhoea. The *post mortem* revealed haemorrhagic gastro-enteritis, and haemorrhages and degenerative changes in various organs. He found that **Haemanthus concolor Herb.** produced no effect when given to a sheep.[25]

Buphane disticha Herb., known at times as Buphane toxicaria Herb., Haemanthus toxicarius Thunb., Jacq., and Gawl., and Amaryllis disticha L. and Pat., Candelabra flower, Sore-eye flower, Cape poison bulb, Gifbol, Seeroogblom, Xosa *iSwadi, iNcwadi,* Suto *lešôma, kxutsana-ya-naha,* in addition to being poisonous, is used medicinally. The Xosas use the dried scales of

the bulb as an outer dressing for circumcision. Europeans use the dried scales, moistened, as a dressing for boils, sores, whitlows, and septic cuts. This is said to relieve pain and to " draw out " the pus. The same dressing appears to be used to relieve rheumatic pains and the pain of abrasions, contusions, etc. According to Smith, the Xosas have in the past used the bulb for " red-water " in cattle. The leaf is used by Europeans as a styptic application to cuts and in the treatment of septic cuts.

Thunberg records that the Hottentots used the bulb for poisoning arrows intended for shooting the smaller kinds of game. He mentions also that they were of the opinion that bulbs grown in the shade were more toxic than those grown in the sun. The Bushmen have also used preparations of the bulb as one of the ingredients for poisoning arrows intended for shooting small game, particularly when the game was intended for food.[2, 3, 4, 5, 6, 7] Lewin [6] has isolated from arrows, brought to Berlin by Lichtenstein from the Cape in 1806, an alkaloid which appears to be identical with *haemanthine* (see below). A decoction of the bulb is commonly taken by natives in the Bethlehem District of the Orange Free State as an enema for suicidal purposes. Juritz [1, 8] records cases of death from the administration of the bulb, in one case per vaginam or per rectum. He isolated from the organs in this case an alkaloid which appeared to be identical with *buphanine* (see below). It is worthy of note, that in every record of the toxic action of the plant, the bulb has been the part used. Thus it is of interest that Suto shepherd boys, in the days before " tin " utensils, used the scooped-out bulb in which to warm their milk (Phillips). In this regard note Tutin's work.[10]

Apparently the above-ground parts are not toxic, for Smith states vultures eat it to sharpen their eyesight, and Davy [9] mentions that cattle constantly browse the plant. Dr Loubser, District Surgeon at Bethlehem, Orange Free State, informs us that he has frequently observed plants of which the leaves had apparently been browsed by stock without ill-effect. On the other hand, Barrow [5] states that the leaves, as well as the bulb, contain a virulent poison. Inhalation of the " fumes," or possibly the pollen of the flower, is said to give rise to severe headache and drowsiness.

Juritz [2, 8, 23] isolated from the bulb on one occasion 0·4 per cent. of uncrystallisable alkaloids, and on another, 4 per cent. The presence of alkaloids is confirmed by Tutin [10] and Lewin.[11] Tutin isolated *buphanine*, a strongly basic amorphous alkaloid, having an action similar to hyoscine. He regarded this as the principal alkaloid. On hydrolysis, *buphanine* gives a crystalline alkaloid *buphanitine*, $C_{23}H_{24}O_6N_2$, melting at 240° (system not specified). He isolated also three minor alkaloids, a small amount of *narcissine*, $C_{16}H_{17}O_4N$, a weakly basic alkaloid which is a convulsant poison, and a water-soluble alkaloid, which resembles *colchicine* and *narcissine* in action. According to Gorter,[12] the *narcissine* of Tutin is identical with *lycorine*, which has been isolated from several Amaryllidaceae. Further, Tutin isolated a small amount of a *volatile oil* (containing furfuraldehyde), *acetovanillone*, *chelidonic acid*, *copper*, *laevulose*, *pentatriacontane*, a *phytosterol*, *ipuranol*, $C_{23}H_{38}O_2(OH)_2$, and a mixture of *fatty acids*, free and combined. It should be noted that Tutin found that the outer dry layers of the bulb contained no alkaloids.

Lewin,[11] working about the same time, isolated an amorphous alkaloid, *haemanthine*, $C_{18}H_{23}NO_7$, from the bulb. It forms amorphous hygroscopic salts with hydrochloric and nitric acids. These salts turn yellow in the air. Haemanthine is narcotic, and in other ways resembles the tropeines in action, except that the cardiac effects are weaker. By subcutaneous injection, the alkaloid produces narcosis and emesis. The *buphanine* of Tutin and the *haemanthine* of Lewin seem to be similar in action.

The root of **Clivia miniata Regel.,** St John's lily, Zulu *ubuHlungu-benamba*, *ubuHlungu-beyima*, *uMayine*, is used as a snake-bite remedy by the Zulus and by the natives in the Transkei. The Zulus also use the root in treating febrile conditions, and the herb in order to facilitate delivery at childbirth, or to initiate parturition when its onset is retarded. The plant contains an alkaloid,[13, 14] *lycorine*, $C_{16}H_{17}O_4N$, which is found in other members of this family. For a full description of the chemical properties of this alkaloid, see Henry's Plant Alkaloids.[15] Henry states that lycorine is emetic in warm-blooded animals, and in large enough dose produces collapse and death by paralysis of the central nervous system.

Clivia nobilis Lindl. has been found to contain a glucoside [16] which was thought to be non-toxic. However, Juritz, [1] later, thinks that the plant played a part in causing the death of a native. He found that a strong decoction is feebly emetic when given in large doses.

Steyn [25] reports also that **Nerine lucida Herb.** has been suspected of causing death in goats. He therefore tested the fresh bulb on a sheep which died within twenty-four hours of receiving 200 grm. by the mouth. The symptoms were prostration, bloating, decrease in the respiratory rate, slowing and irregularity of the pulse, and finally, clonic spasms. *Post mortem*, the heart was in diastole and the cardiac muscle flabby, marked swelling and hyperaemia of the spleen, slight hyperaemia of the lungs, and distension of the rumen with gas.

Amaryllis belladonna L., Amaryllis, Belladonna lily, March lily, Maartlelie, also contains *lycorine*.[14] For its properties, see under Clivia miniata Regel. Kilmer [17] isolated from the dried bulb 0·3 per cent. of alkaloids, which resemble *hydrastine* in action. Intramuscular injection of the alkaloids into cats and dogs produces muscular stiffness and inco-ordination, and stimulation of the respiration followed by depression. The product is feebly mydriatic but not emetic, and 0·2 grm. per kilo given to a cat intramuscularly kills it in four hours, by paralysing the respiration. Steyn [18] records similar symptoms from the administration of the bulb and seed to the sheep and the rabbit, the animals showing, *post mortem*, marked cyanosis, dilatation of the heart chambers, and hyperaemia of the lungs. Cases in which death was delayed somewhat, showed acute haemorrhagic gastritis. This data of Steyn's was originally published under the name of Nerine, probably Nerine marginata Herb,[18] but he now [25] states that the plant is Amaryllis belladonna L. He [25] has obtained from the seed a toxic product which appears to be alkaloidal in character.

The Zulus use a decoction of the bulb of **Brunsvigia**, *prob.* **Brunsvigia grandiflora Lindl.,** Zulu *umQeme-wenkunzi*, *umQele-wenkunzi*, by the mouth for coughs and colds, and as an enema in renal and hepatic conditions. They

also use an infusion of the bulb of **Brunsvigia sp.,** Zulu *uMayime*, as an emetic, and as an enema in stomach troubles.

The Sutos use a decoction of the bulb of **Brunsvigia,** *prob.* **Brunsvigia minor Lindl.,** Suto *lematla-le-leholo*, as an enema for pains in the back. They also make a decoction for treating barrenness from **Brunsvigia cooperi Bkr.,** Suto *lematla*.

Vallota speciosa (L. f.) Dur. and Schinz. (Vallota purpurea Herb.), Knysna lily, George lily, Berglelie, has been proved to be toxic experimentally.[18] Preparations of the bulb produce poisoning in the rabbit, sheep, and dog, the symptoms being those of an acute irritant poisoning, and death by consequent exhaustion. The *post-mortem* findings confirm this.

An alcoholic infusion of the fruit of **Gethyllis spiralis L. f.** (Gythelia spiralis), Koekoemakranka (Bramakranka), Koekmakranka, was taken by the early Cape colonists for the relief of colic and flatulence (Pappe). Wicht states that, in more recent times, Europeans take a weak tincture of the fruit (made with brandy) for acute indigestion. The ripe fruit is highly aromatic.

Thunberg mentions that the pods of **Gethyllis sp.,** Koekoemakranka, have a pleasant smell, and were used by the ladies of the colony to perfume rooms. He states that the odour resembles somewhat that of strawberries. Burchell states that **Gethyllis ciliaris L. f.,** Hottentot koekoemakranka, Bramakranka, has an agreeable taste, but was more valued for its very pleasant odour, resembling that of ripe fruit.

Crinum longifolium Thunb., Orange River lily, Oranje Rivier lelie, Seeroogblom, Suto *ledutla*, *motôtse*, is a Suto remedy for colds (Phillips). Steyn [18] found the bulb and leaf to be non-toxic to the rabbit. The Zulus use the bulb of **Crinum sp.,** Natal lily, Zulu *umDuze*, as one of the ingredients in medicines for the treatment of scrofula, difficult micturition, and rheumatic fever (Bryant).

Cyrtanthus obliquus Ait., Sore-eye flower, Justifina, Zulu *uMathunga*, is used medicinally by the Zulus (Bryant). The bulb is one of the ingredients in a medicine for scrofula and in another for troublesome chronic coughs ; a decoction of the bulb alone is a remedy for scrofulous coughs. The dried dark portion of the root is used as a snuff for the relief of headache resulting from old skull wounds, and the same powder is rubbed into incisions made at the seat of a fractured bone with a view to aiding union.

Agave americana L., Agave, American aloe, Century plant, American agave, Gareboom, Garingboom, is an introduced plant now widely distributed in South Africa. The leaves are heated and split, and applied in rheumatism to relieve pain. An infusion of the cut-up leaves is used as a purgative. In the Karroo, farmers make a dryish extract from the leaves for purgative use in animals, especially ostriches. The ground-up leaves are added by natives to powdered tobacco in making snuff. Curson [19] suspects the plant of being toxic to stock under field conditions. The fresh juice, in addition to being purgative, is diuretic and emmenagogue.[20] The leaves are also said to be used as a counter-irritant,[20] and an acrid *volatile oil* has been isolated from them (Lenoble [20]). The plant also contains *agave gum*.[20] Pammel says the plant is used as a fish poison in some countries.

Hypoxis villosa L. f., Inkbol, Suto *kxuwa-ke-mawatla*, *modi-letaha*, *lehlaba-kolobe*, is used by the Sutos as a medicine, and as a charm against thunder.

The Nyanjas (Nyasaland) use a decoction of the root of **Hypoxis nyasica Bkr.** *ex deser.*, Nyanja *nkamba*, as a cough medicine. It is said to induce perspiration.

According to Smith, the Xosas heat the bulbs of **Hypoxis argentea Harv.** and its *variety* β **Bkr.,** Xosa *iXalanxa*, to obtain an oil which they use to anoint chafes on horses. In times of famine they eat the bulbs roasted or boiled. They also use water boiled in the scooped-out bulbs of **Hypoxis obliqua** (*sic*), Xosa *iXalanxa*, as a lotion for septic wounds. According to Bryant, **Hypoxis latifolia Hook.,** Zulu *iLabatheka*, is poisonous. In addition, it is used by the Zulus as a medicine. It is a remedy for barrenness, and a hot infusion of the bulb is taken as an emetic for the disagreeable dreams said to accompany heart weakness. The plant is supposed by the Zulus to produce delirium. They use the ground-up bulb mixed with food to poison small vermin. The Zulus also use the roots of **Hypoxis sp.,** Zulu *inKomfe-enkulu*, as one of the ingredients of an infusion taken as an " internal parasiticide " and purgative (Bryant).

The root stock of **Hypoxis argentea Harv., *var.* flaccida Bkr.,** Suto *leihlô-la-kxomo-le-leholo*, is eaten by the Sutos. Dried and crushed, and mixed with fat, it is used by them as an ointment for cracks on the teats of cows in milk (Phillips).

The root of **Hypoxis rigidula Bkr.** has been used as a remedy for gall-sickness in cattle, but Hutchence [24] found it useless in two cases of the disease.

A decoction of **Hypoxis rooperi Moore** is given by the Chuanas and Kwenas as a tonic to weak children. The preparation produces purgation.

REFERENCES

1. C. F. Juritz : So. Afr. J. Sci., 1914, xi, 116, 120, 121.
2. C. F. Juritz : So. Afr. J. Sci., 1911, viii, 98, 99.
3. G. Stow : Native Races of South Africa, 78.
4. I. Schapera : Bantu Studies, 1925, ii, 200, 210.
5. J. Barrow : Travels in Africa, 1801, ii, 391.
6. L. Lewin : Zeit. f. Ethnolog., 1912, 44, i, 834.
7. S. S. Dornan : So. Afr. J. Sci., 1916, xiii, 357.
8. C. F. Juritz : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 231.
9. J. Burtt-Davy : 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 208.
10. F. Tutin : Trans. Chem. Soc., 1911, 99.
11. L. Lewin : Arch. f. exp. Path. u. Pharm., 1912, lxviii, 333.
12. K. Gorter : Bull. Jard. Bot. Buitenzorg, 1920, i, xiii, 352, through Chem. Abs., 1920, xiv, 3699.
13. —. Molle : Jahresber. Pharm., 1903, 27, through ref. No. 14.
14. K. Gorter : Bull. Jard. Bot. Buitenzorg, 1920, ii, iii, 331, through Chem. Abs., 1921, xv, 2110.
15. T. A. Henry : The Plant Alkaloids, 1924, 2nd Edition, 227.
16. C. F. Juritz : Rpt. Senior Analyst for 1904, Cape of Good Hope, G. 66—1905, 29.
17. F. B. Kilmer : J. Amer. Pharm. Ass., 1916, v, 1202, through Chem. Abs., 1917, xi, 384.
18. D. G. Steyn : 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 778, 779, 780.
19. H. H. Curson : 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 205, 208.
20. United States Dispensatory, 1926, 21st Edition, 1187.
21. C. F. Juritz : Rpt. Senior Analyst, 31st December 1905, Cape of Good Hope, G. 43—1906, 40.
22. C. F. Juritz : Rpt. Senior Analyst for 1909, Cape of Good Hope, G. 10—1909, 154.
23. C. F. Juritz : Rpt. Senior Analyst for 1903, Cape of Good Hope, G. 59—1904, 59, 63.
24. M. A. Hutchence : Rpt. Colonial Vet. Surg. for 1899, Cape of Good Hope, G. 35—1900, 39.
25. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 709, 710, 711.

XIII. DIOSCOREACEAE

The tuber of **Dioscorea dregeana Bkr.,** Pondo and Xosa *inGcolo*, is used medicinally in a variety of ways by natives. The Pondos and Xosas scoop it out and heat water in it. This water is used as a lotion for cuts and sores, etc., in both human beings and animals. Some natives use a cold infusion in teaspoonful doses as a soporific ; others state that if it is eaten raw or parboiled it produces narcosis. It has been observed that chickens drinking the lotion above mentioned become paralysed and stiff, and in many cases die. Natives in the Lusikisiki district use the plant to destroy monkeys, by boiling mealie cobs in a strong decoction of the tuber and placing them, after drying, about the mealie lands. On eating them, the monkeys become paralysed and are then killed. In famine times the Pondos eat the tubers, but soak them in running water for several days previously. If insufficiently soaked, paralysis of the legs and a condition akin to drunkenness is said to follow their ingestion.

In Sekukuniland, the tuber of **Dioscorea dumetorum Pax.,** Giftulp, Venda *sekanama*, Zulu *inGcolo*, is used as a local application to relieve pain. The application is said to produce a burning sensation. The Zulus use the ground-up tuber, mixed with green mealies, as a poison-bait for monkeys which, on eating it, become stupefied, and are easily dispatched.

A lotion made by boiling in water the crushed inner parts of the tuber of **Dioscorea sylvatica Kunth.,** Zulu *inGwevu*, is used by the Zulus for bathing swollen udders, and as a drench for uterine troubles in cows.

Bryant and Marloth [1] state that **Dioscorea rupicola Kunth.,** Zulu *in Kwa*, is poisonous. Bryant states, further, that the tubers, when boiled, are eaten by the Zulus in times of famine.

REFERENCE

1. R. Marloth : The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 5.

XIV. IRIDACEAE

The Zulus use a cold or warm infusion of the inner part of the rhizome of **Moraea iridioides L.,** Zulu *inDaw'ihlathi*, by the mouth, or as an enema for dysenteries.

Moraea polystachya Ker. (Iris polystachya Thb., Vieusseuxia polystachya Eckl.), Blue tulp, Cape blue tulp, Blou tulp, Kaapse blou tulp, Tulp, Wilde tulp, is poisonous,[1, 2, 3] and causes considerable loss of stock. Ecklon, in 1830, recorded already that the young leaves of this plant cause sickness in horned cattle.[1 8] The symptoms of poisoning, as recorded by Hutcheon,[1] are an acute gastro-enteritis, with prostration, followed by collapse in fatal cases. Survival is followed by inflammation of the bile ducts. Steyn states that the corm produces diarrhoea in cattle, and that 1½ lbs. by the mouth kills an ox,[4] and 250 grm. a sheep.[5]

Moraea polyanthos Thunb.,[6, 15] Cape tulp, Blue tulp, **Moraea spathacea Ker.**,[5] Nokha, Suto *teele-ya-noka*, *teele-e-kxolo*, and **Moraea rivularis Schltr.**, are also toxic. Hutcheon[15] states that Moraea polyanthos is irritant, and produces symptoms of gastro-enteritis in stock. **Moraea collina Vent.** has apparently caused fatal poisoning in human beings,[4] while **Moraea tenuis Ker.** is possibly toxic.[4] **Moraea setacea Ker.**, Blue tulp, Blou tulp, Bokuintjie, produces no effects when drenched to rabbits.[5]

The corm of **Moraea edulis Ker.**, Uintjie, Suto *teele*, *teele-tsikwane*, is eaten,[2] but according to Phillips, cattle unaccustomed to the plant die in a few hours after browsing it. Steyn[16] administered 90 grm. of dried leaf and flower to a sheep without result.

Farmers suspect **Moraea simulans Bkr.** of being toxic to stock when in flower, but Steyn administered 10 grm. of dried leaf and fruit to a rabbit without effect.[16]

Homeria pallida Bkr., Yellow tulp, Transvaal yellow tulp, Tulp, Transvaal tulp, Transvaal geel tulp, Kxatla *sekaname*, is poisonous. The earliest published record of poisoning in stock is by Burtt-Davy, in an investigation into the possible causes of Lamsiekte.[6] The poisonous nature of the plant has been confirmed by later writers.[2, 4, 8, 9, 10, 11] The symptoms of poisoning in herbivora are "abdominal pain, diarrhoea, and dejection."[10] In serious cases, the animal becomes increasingly weaker and stuporous, and finally may die, "apparently unconscious, passing liquid faeces every few minutes."[10] Steyn[4] states that 4 to 8 oz. of the corm is sufficient to kill an ox in twenty-four to forty-eight hours. The symptoms somewhat resemble those of slangkop poisoning (Urginea burkei Bkr., Urginea macrocentra Bkr., and Ornithoglossum glaucum Salisb.), but Steyn[4] points out a valuable sign of distinction, viz., that in slangkop poisoning the heart rate is slowed and in Homeria poisoning quickened. The Imperial Institute[8] isolated a brown sticky alkaloidal mass from the dried leaves. This is soluble in water, and has a mildly unpleasant taste. The leaves contain no cyanogenetic glucoside. Rindl,[11] later, succeeded in separating a bitter *alkaloid* from the above-ground parts of the plant. This is toxic, and soluble in water and alcohol. He states that Dixon found the alkaloid to have a typical digitalis action, except that it is non-cumulative. The Kxatlas administer an infusion of the "root" to bulls to increase their potency.[17] An infusion of Ximenia caffra or the ash of a mole is sometimes added.

Homeria collina Vent., Cape tulp, Yellow tulp, Geel tulp, Groot tulp, Tulp, is also poisonous, causing loss of stock.[2, 12] Cases of fatal poisoning by the corm in human beings have been recorded, in which symptoms of severe gastro-enteritis were produced.[13] Mackenzie[14] isolated from the corm (Homeria collina Vent., *var.* miniata) a *glucoside*, which is the active principle. It has a digitalis action on the heart, constricts blood-vessels, raises the blood-pressure, and has a curare-like effect on voluntary muscle.

Homeria elegans Sweet and **Homeria aurantiaca Sweet**, Red tulp, Yellow tulp, Rooi tulp, are poisonous.

All species of Moraea and Homeria should be regarded as toxic until the contrary is proved.

XIII. DIOSCOREACEAE

The tuber of **Dioscorea dregeana Bkr.,** Pondo and Xosa *inGcolo*, is used medicinally in a variety of ways by natives. The Pondos and Xosas scoop it out and heat water in it. This water is used as a lotion for cuts and sores, etc., in both human beings and animals. Some natives use a cold infusion in teaspoonful doses as a soporific ; others state that if it is eaten raw or parboiled it produces narcosis. It has been observed that chickens drinking the lotion above mentioned become paralysed and stiff, and in many cases die. Natives in the Lusikisiki district use the plant to destroy monkeys, by boiling mealie cobs in a strong decoction of the tuber and placing them, after drying, about the mealie lands. On eating them, the monkeys become paralysed and are then killed. In famine times the Pondos eat the tubers, but soak them in running water for several days previously. If insufficiently soaked, paralysis of the legs and a condition akin to drunkenness is said to follow their ingestion.

In Sekukuniland, the tuber of **Dioscorea dumetorum Pax.,** Giftulp, Venda *sekanama*, Zulu *inGcolo*, is used as a local application to relieve pain. The application is said to produce a burning sensation. The Zulus use the ground-up tuber, mixed with green mealies, as a poison-bait for monkeys which, on eating it, become stupefied, and are easily dispatched.

A lotion made by boiling in water the crushed inner parts of the tuber of **Dioscorea sylvatica Kunth.,** Zulu *inGwevu*, is used by the Zulus for bathing swollen udders, and as a drench for uterine troubles in cows.

Bryant and Marloth [1] state that **Dioscorea rupicola Kunth.,** Zulu *in Kwa*, is poisonous. Bryant states, further, that the tubers, when boiled, are eaten by the Zulus in times of famine.

REFERENCE

1. R. Marloth : The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 5.

XIV. IRIDACEAE

The Zulus use a cold or warm infusion of the inner part of the rhizome of **Moraea iridioides L.,** Zulu *inDaw'ihlathi*, by the mouth, or as an enema for dysenteries.

Moraea polystachya Ker. (Iris polystachya Thb., Vieusseuxia polystachya Eckl.), Blue tulp, Cape blue tulp, Blou tulp, Kaapse blou tulp, Tulp, Wilde tulp, is poisonous,[1, 2, 3] and causes considerable loss of stock. Ecklon, in 1830, recorded already that the young leaves of this plant cause sickness in horned cattle.[1 8] The symptoms of poisoning, as recorded by Hutcheon,[1] are an acute gastro-enteritis, with prostration, followed by collapse in fatal cases. Survival is followed by inflammation of the bile ducts. Steyn states that the corm produces diarrhoea in cattle, and that 1½ lbs. by the mouth kills an ox,[4] and 250 grm. a sheep.[5]

Moraea polyanthos Thunb.,[6, 15] Cape tulp, Blue tulp, **Moraea spathacea Ker.,**[5] Nokha, Suto *teele-ya-noka*, *teele-e-kxolo*, and **Moraea rivularis Schltr.**, are also toxic. Hutcheon[15] states that Moraea polyanthos is irritant, and produces symptoms of gastro-enteritis in stock. **Moraea collina Vent.** has apparently caused fatal poisoning in human beings,[4] while **Moraea tenuis Ker.** is possibly toxic.[4] **Moraea setacea Ker.,** Blue tulp, Blou tulp, Bokuintjie, produces no effects when drenched to rabbits.[5]

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Homeria elegans Sweet and **Homeria aurantiaca Sweet,** Red tulp, Yellow tulp, Rooi tulp, are poisonous.

All species of Moraea and Homeria should be regarded as toxic until the contrary is proved.

Belamcanda punctata Moench., Zulu *inDawoluthi-emnyama*, is employed by the Zulus in treating hysteria in young women. The root is used. The Zulus also use **Belamcanda sp.,** Zulu *inDawoluthi-emhlophe*, as a remedy for abdominal upsets. Both these records are from Bryant.

The herb of **Aristea cyanea Ait.**, Maagbos, is infused like tea, and drunk in abdominal troubles.

The Sutos inject a decoction of the corm of **Dierama pendula Bkr.,** Suto *lethepu*, as a strongly purgative enema.

The Sutos drink a decoction of the corm of **Gladiolus psittacinus Hook.,** Natal lily, Suto *kxahla-e-kholo*,* Pedi *moxôxa-leleme*, for colds, and in the treatment of dysenteries. The powdered corm is often also taken for the latter purpose, and the smoke from burning corms is sometimes inhaled for colds.

The Zulus make a medicine, to facilitate the birth of the placenta, from the corm of **Gladiolus ludwigii Pappe,** Zulu *isiDwa*, and give a decoction of the corm as an enema to relieve dysmenorrhoea (Bryant). A decoction of the corm of **Gladiolus ecklonii Lehm.,** Suto *kxahla*, is drunk by the Sutos to relieve rheumatic pains, and they eat with food the cooked corm of **Gladiolus saundersii Hook. f.,** Suto *kxahla-ya-maloti*, for diarrhoea (Phillips). The Sutos also use **Gladiolus dieterlenii Phillips,** Suto *kxahla-e-nyenyane*, with other plants as an enema, and alone as a remedy for headache and lumbago (Phillips).

Antholyza paniculata Klatt., Suto *kxahla-ya-bokone*, *moloke*, is a Suto remedy for diarrhoeas in human beings and cattle, and **Watsonia densiflora Bkr.,** Suto *kxahla*, a Suto remedy for diarrhoeas in calves (Phillips).

REFERENCES

1. D. Hutcheon: Agr. J., Cape of Good Hope, 1900, xvii, 84.
2. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 5, 16.
3. E. P. Phillips: Bot. Survey South Africa, Memoir IX, 1926, 16.
4. D. G. Steyn: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, 197, 199, 201.
5. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 793, 794.
6. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 196, 198.
7. H. H. Curson: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, 205.
8. Bull. Imp. Inst., 1916, xiv, 31.
9. I. B. Pole-Evans: So. Afr. J. Sci., 1920, xvii, 1.
10. S. M. Stent and H. H. Curson: Union of So. Afr. Dept. Agriculture, Bull. vi, 1922, 3.
11. M. Rindl: Trans. Roy. Soc. So. Afr., 1924, xi, 251.
12. L. H. Walsh: South African Poisonous Plants, 1909, 41.
13. L. Pappe: Florae Capensis Medicae Prodromus, Cape Town, 1868, 3rd Edition, 37, 39.
14. A. T. Mackenzie: So. Afr. Med. Record, 1910, viii, 94.
15. D. Hutcheon: Rpt. Colonial Vet. Surg. and Assist. Vet. Surg., 1894, Cape of Good Hope, G. 42—1895, 10.
16. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, Part II, 719, 720.
17. I. P. Schapera: So. Afr. J. Sci., 1930, xxvii, 559.
18. C. F. Ecklon: So. Afr. Qtly. J., 1830, iv, 367.

XV. ZINGIBERACEAE

The Zulus and Swazis think that the administration to horses of a cold infusion of the tuber of **Kaempferia** *near* **Kaempferia ethule Wood,** Thonga *širungulu*, Swazi *inDungulu*, *inCathafane*, causes horse-sickness to take a very

* *Kxahla* is the generic Suto name for **Gladiolus.**

mild form. It is not regarded as either a cure or a preventive. Overdosage is said to stupefy the animals and cause loss of condition. The Swazis also use the plant as a Malaria remedy, and their women chew it during the menses, probably to relieve pain. Dried tubers from the Transvaal yield about 2 per cent. of a *volatile oil* and a very small amount of *heavy oil*.[1, 2] The composition of the volatile oil is given. It is unsuitable for perfumery.

REFERENCES

1. E. Goulding and O. D. Roberts: J. Chem. Soc., 1915, cvii, 314.
2. Anon.: Bull. Imp. Inst., 1915, xiii, 15; 1916, xiv, 378.

XVI. ORCHIDACEAE

An infusion of the root of **Habenaria foliosa Reichb. f.,** Zulu *nokomkeshe*, Suto *mametsane*, *lekxôlêla-la-matêbêlê*, is used as an emetic by the Zulus.

In Portuguese East Africa, natives drink a liquid extract of **Monadenium lugardae N. E. Br.,** Chopi (?) *tshulu*, *mahumula*, **Portulaca quadrifida L.,** and *momingate* (not determined) as a gonorrhoea remedy. The Monadenium taken alone is said to be poisonous and to produce vomiting.

Ansellia humilis Bull., *mwikalampungu*, Zulu *imFe-yenkawu*, *iSaka*, *iPhamba*, which grows on trees, is used medicinally. The Zulus take an infusion of the stems, leaves, or roots as an emetic. Zulu youths, wishing harm to an unmarried maiden, use the roots as a charm, which is thought to prevent her from ever giving birth to children. Natives in the Mpika district (Northern Rhodesia) administer an infusion of the leaves and stems as a remedy for madness. The Pedis use an infusion of the root of **Ansellia gigantea Reichb.,** which also grows on trees, as a cough remedy for small children.

Lissochilus krebsii Reichb. f. is a Swazi medicine for infants (diseases unknown).

The Zulus drink a decoction of **Eulophia arenaria Bohn.,** Zulu *amaBelejongosi*, as a remedy for impotency and barrenness (Bryant). The Sutos apply powdered burnt tuber of **Eulophia flaccida Schltr.,** Suto *lekweša*, *lekxôlêla*, to incisions made on painful limbs. It is said to relieve pain rapidly. It is interesting to note that "*lekweša*" means "the astringent one," the tuber apparently being astringent (Phillips).

Barren Suto women drink daily a cold infusion of the tuber of **Eulophia hians Spreng.,** Suto *maholahanya*, *moisa-têlêha*, *nêtê-la-ntja*, *lekxôlêla*, **Eulophia flaccida Schltr.,** or **Eulophia robusta Rolfe.,** Suto *lekxôlêla-la-matêbêlê*, *lekweša*, *moisa-têlêha*, and continue the treatment for four months after conception. Sometimes the first two are used together.

The Sutos use the bulb of **Eulophia sp.,** Suto *lekxôlêla-la-matêbêlê*, as an ingredient in any medicine given during protracted illness.

XVII. PIPERACEAE

Piper capense L. f., Bospeper, Wilde-peper, Shambala *gugufa*, has been used as a stomachic. The Shambalas (Tanganyika Territory) use a decoction

of the root as an anthelmintic. Europeans and natives in the Western Province take a water or brandy infusion of the fruits for stomach, heart, and kidney diseases. It is said to cause sweating and sleepiness. In older times such preparations were taken as a stomachic and carminative in indigestion, flatulency, and colic (Thunberg). The fruits have a hot, pungent taste and an aromatic smell.

XVIII. SALICACEAE

Europeans drink a decoction of the leaves of **Salix capensis Thunb.,** Cape willow, Wild willow, River willow, Native willow, Wilgeboom, Suto *moduwane*, Xosa *umGcunube*, Thlaping *modibonoka*, for muscular rheumatism. The leaves are bitter, and are used by the Xosas and Hottentots in rheumatic fever. Pijper states that in the Transvaal dropsical patients are given an infusion of willow-tops, and are also bathed in it, and that a leaf decoction is used in febrile conditions. A Transvaal species of willow is used in acute rheumatism, but we do not know if it is Salix capensis.

A decoction of twigs of **Populus canescens Sm.,** *var.* **rossii,** Poplar, Populierboom, is taken by the Chuanas and Kwenas for the relief of abdominal pains.

XIX. MYRICACEAE

Myrica cordifolia L., Wax berry, Wax bush, Glashout, Wasbes, yields "berry wax," which is prepared by placing the branches in boiling water and skimming off the fat. The substance is not a wax, but is a true fat, consisting of the glycerides of stearic, palmitic, and myristic acids.[1] Thunberg states that the Hottentots formerly ate the fat. An infusion of the leaves of **Myrica quercifolia L.,** Maagpynbossie, is used to relieve stomach-ache (Wicht). The Sutos administer **Myrica aethiopica L.,** Suto *monna-e-mothso*, *maloléka* or *malolêha*, in dysmenorrhoea (Phillips).

REFERENCE

1. B. St. J. v. d. Riet: Trans. So. Afr. Phil. Soc., 1906, xvi, 443.

XX. ULMACEAE

The Zulus use the bark of **Chaetacme aristata Planch.** (Chaetacme meyeri Harv.), Zulu *umKhovothi*, in the treatment of haemorrhoids. They, in addition, use the powdered root as a dental anodyne (Bryant).

XXI. MORACEAE

Ficus capensis Thunb., Wild fig, Cape fig, Fire sticks, Kooman, Wilde-vyeboom, Grootvy (Louis Trichardt), Zulu *umKhiwane*, Ila *umuYweywewe*,

Xosa *uLuzi*, is used in both human and veterinary medicine. The Zulus drink a decoction of the root and bark for suspected ulceration in the lungs, and give an infusion of the root, leaves, and bark to cows yielding insufficient milk. The Vendas administer a decoction of the root to cows with retained placenta to assist its expulsion. The Ilas use the plant to prevent vomiting.

A decoction of the bark of **Ficus ingens Miq.**, Glabrous fig, Zulu *um Khonswane*, is a Zulu remedy for cows yielding insufficient milk. They also use the preparation as a remedy for anaemia in human beings.

Zulu men take a decoction of the bark of **Ficus** *cf.* **Ficus soldanella Warb.**, Rooitou, Zulu *um Luga*, Thonga (Eastern Transvaal) *i Ndendi*, as a " strengthening tonic."

The Ilas use water in which sliced-up roots of a **Ficus sp.**, Ila *ici Lemalema*, have been soaked as a lotion for wounds.

In addition to the foregoing, the latex of the common edible fig, **Ficus carica L.**, is used as an application to warts to cause their disappearance. Another method is to transfer the warts to a fig tree by grafting a drop of blood from a wart on to a young twig. The latex is sometimes dropped into ant holes near houses to drive ants away. A decoction of fig roots and of the leaves of **Carpobrotus edulis N. E. Br.** (**Mesembrianthemum edule L.**) is used as a gargle in diphtheria, and a plaster of dried figs is used to " draw " abscesses (Pijper). It is a prevalent belief among many women that the eating of dried figs facilitates conception (Pijper). The fresh roots are used in making a lotion for thrush (Pijper). The fruit of this fig is, of course, laxative.

Cannabis sativa L., Cannabis indica, Indian hemp, Hemp, Hashish, Ganjah, Dagga, Xosa *um Ya*, Suto *matakwane*, *matokwane*, *matekwane*, *mmoana*, is smoked as an intoxicant among South African natives. The Fingos use the leaves as a snake-bite remedy, and the Xosas as part of the treatment of bots in horses. The " oil " from a dagga pipe has been used by European " cancer curers " as an external application (Muir). In Southern Rhodesia, natives use the plant, among others, as a remedy for malaria, blackwater fever, blood-poisoning, anthrax, and dysentery, and as a " war medicine " (Dornan). The Sutos administer the ground-up seeds with bread or mealie-pap to children during weaning (Phillips). Suto women smoke cannabis to stupefy themselves during childbirth (Hewat). The plant, if grown in a suitable climate, is well known as a narcotic inebriant, and is also habit-forming. The narcotic action is due to the presence in the tops of female plants of an oily principle containing resins, named *cannabinol*. The seeds yield a non-drying fixed oil used in the arts. They are not narcotic. Recent work [1] indicates that Indian hemp grown in a temperate climate has the same properties as that grown in the tropics. Some interesting data on the action of the plant and its effects in habit are given by Dontas and Zis.[2]

REFERENCES

1. H. Gayer: Arch. f. exp. Path. u. Pharm., 1928, cxxix, 312.
2. S. Dontas and P. Zis: Arch. Internat. de Pharmacodyn. et de Thérap., 1928, xxxv, 30.

XXII. URTICACEAE

Dried and powdered **Urtica dioica L.,** Nettle, Brandnetel, Brandnekel, Suto *bobatsi*, is used as a snuff to stop haemorrhage from the nose, and an infusion is drunk lukewarm to stop excessive menstrual flow. The Sutos use **Urtica dioica L.,** *var.* **eckloniana,** and also **Urtica meyeri Wedd., *var.* lobulata,** Suto *bobatsi*, as ingredients in snake-bite remedies. An *alkaloid* having a powerful vasomotor effect in mammals has been isolated from the plant.[1] Haberlandt [2] has isolated a non-volatile *albuminoid*, and Reuter [3] a *glucoside*. It has generally been accepted that the irritating material in the stinging hairs is *formic acid*, but a recent investigation has given us valuable information. Flury [4] finds that the urticating hairs have a protoplasm with an alkaline reaction, which encloses an acid cell sap. This cell sap contains a small amount of formic acid, accompanied by acetic, butyric, and other volatile fatty acids. The real poisonous principle is a *non-volatile unsaturated acid substance*, containing no nitrogen, and allied to the resin acids. The urticating poison, therefore, is neither formic acid nor an enzyme nor a toxalbumin. Less than 0·0001 mg. of this principle will react on human skin. One hundred nettle hairs weigh about 1 mg., and to obtain 40 grm. of the principle required the hairs from 100 kilos of fresh nettles.

Urtica urens L., Nettle, Dwarf nettle, Brandnetel, Brandnekel, Zulu *im Babazane*, is one of a series of Zulu aphrodisiac drugs (Bryant). In composition and effects it probably resembles Urtica dioica L. Pammel says the plant is irritant, and has been used in medicine as such.

According to Smith and Hewat, the Xosas use a paste of **Urtica sp.,** Xosa *i Rau*, as an external application to sore, reddened eyes. Smith states that it is not the nettle of Europe.

The Zulus inject a decoction of the stem of **Pouzolzia hypoleuca Wedd.,** Zulu *u Dekane*, Shona (?) *nanza*, as a mild enema in biliousness. In Mashonaland thin strips of the bark are used in sewing wounds, and are regarded as having healing properties in addition.

REFERENCES

1. Oddi and Lomonaco:
2. G. Haberlandt:
3. L. Reuter:

All from United States Dispensatory, 1926, 21st Edition, 1516.

4. F. Flury: Zeits. exp. Med., 1927, i, 56.

XXIII. PROTEACEAE

The fruits of **Brabeium stellatifolium L.,** Wild chestnut, Hottentot's almond, African almond, Wild almond, Wilde kastaiing, Wilde amandel, were formerly eaten by the Hottentots, and the farmers at the end of the eighteenth century used them as a coffee substitute by removing the rind and soaking the fruits in water to get rid of bitterness, then boiling, roasting, and grinding. The seeds contain a bitter, *cyanogenetic glucoside* and an *enzyme*.[1] Bowie [6] states that the kernel is dangerous unless soaked in water for a sufficient length of time to extract the toxic principle.

The Pondos use the bark of **Faurea macnaughtonii Phillips** (Faurea arborea Sim.), Beukehout, Terblanz (Knysna), Pondo *isiFa*, as a poison for homicidal purposes.

An infusion of the decorticated root of **Protea hirta Klotzsch.,** Sugar bush, White sugar-bush, Suikerbos, Zulu *isiQalaba*, Pedi *moxalaxala*, is used by the Zulus as a remedy for dysenteries in human beings and calves.

Thunberg states that in his time the inspissated sweet juice from the calyx of **Protea mellifera L.,** Sugar bush, Tulpboom, Suikerbos, was used in disorders of the breast. Farmers nowadays concentrate the nectar into " bossiesstroop " (syrupus proteae). Pappe says it is of value in cough and pulmonary affections. It contains *laevulose* and *dextrose*, but no formic acid.[1] Beck and Meiring [2] isolated from the leaf a substance which they named *proteacin*. This was later named *leucodrin* by Merck and Hesse. The latter [3] states that the leaves also yield 2 to 5 per cent. of *hydroquinone* and *proteacic acid*. Hydroquinone is a polyatomic phenol which has much the same action as carbolic acid but is more toxic. Bowie [6] states that the Proteaceae are astringent, and that the bark has been used successfully in place of cinchona bark.

Protea lepidocarpon R. Br. and other **spp. Protea,** according to Pappe, yield a similar nectar to that from Protea mellifera L.

Thunberg records that the rough bark of **Protea grandiflora L.,** Waboom, Wahout, was used as an astringent in diarrhoeas, and Marloth [1] states that the plant yields a tanning material. According to Thunberg, **Protea speciosa L.,** Kreupelboom, was used for tanning leather. Both appear, therefore, to contain tannins.

The bark of **Leucospermum conocarpum R. Br.,** Kreupelhout, is used for tanning (Marloth).

Leucodendron concinnum R. Br., Kienabossie, Langbeen, is used as a malaria remedy. Beck and Meiring [4] isolated from the leaves a crystalline substance, *proteacin*. Later, Merck [5] isolated *leucoglycodrin*, $C_{27}H_{44}O_{10}$, or $C_{27}H_{42}O_{10}$, an amorphous white glucoside, and *leucodrin*, $C_{15}H_{16}O_8$, a crystalline bitter principle melting at 211° to 213° C. It is possible that *proteacin* corresponds to *leucodrin*.

REFERENCES

1. R. Marloth : (*a*) Agr. J. Cape of Good Hope, No. 13, 1909, 4 ; (*b*) The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 7, 17.
2. J. H. Meiring Beck and I. Meiring : So. Afr. Med. J., 1884, through C. F. Juritz, So. Afr. Med. Rec., November 1915.
3. United States Dispensatory, 1926, 21st Edition, 1439.
4. J. H. Meiring Beck and I. Meiring : Pharm. J. and Trans., 1886, 327.
5. Merck's Berichte, 1895, 3.
6. James Bowie : Comm. to So. Afr. Institution, 30th September 1829.

XXIV. LORANTHACEAE

The Zulus administer the powdered bark of **Loranthus dregei E. and Z.,** Zulu *uDumba*, *iNomfe*, in an enema of milk for stomach troubles in children. Zulu boys rub the crushed seeds on sticks for catching birds.

Thunberg records that **Viscum aethiopicum** (*sic*) was used in diarrhoea and as a tea substitute.

Viscum capense L. f., Mistletoe, Mistel, Martak, Voëlent, Voëllym, Lidjiestee, and **Viscum rotundifolium Thunb.,** Mistletoe, Mistel, Martak, Voëlent, Voëllym, are rubbed on warts by Europeans to cause them to disappear. Pappe records that the stems are mucilaginous and slightly astringent, and that they were used in early epilepsy in children and for looseness of the bowels in young females. The plant was also recommended for St Vitus' dance, asthma, and similar conditions, given as a powder or an infusion. Bowie [1] states also that both are astringent, and that **Viscum pauciflora L. f.** is the same.

The Zulus steep a **Viscum sp.,** Mistletoe, Zulu *isiSende*, in milk, and administer this as an enema to infants with stomach trouble. The Xosas use a decoction of a **Viscum sp.,** Mistletoe, Xosa *inDembu*, growing on mimosa trees, in lumbago, and a decoction of another sp. for sore throat.

REFERENCE

1. James Bowie: So. Afr. Qtly. J., 1830, i, 30.

XXV. SANTALACEAE

The natives near Filabusi (Southern Rhodesia) rub in ground-up **Osyris abyssinica Hochst.,** formerly known as Colpoon compressum Berg., Cape sumach, Transvaal sumach, Bark bush, Bergbas, Bessiebas, Pruimbas, Bloupruim, Jakkalspruim, Namtarri Wildegranaat, Suto *mofetola*, Filabusi Dist. *inGondota-mpete*, to relieve swelling of the testes. For this it is usually mixed with **Berkheya latifolia Wood and Evans.** The plant is used for tanning, and contains from 11 to 26 per cent. of *tannins*, the higher readings being given by specimens having a higher percentage of leaves.[1] It also contains a bright yellow glucoside, *osyritin*, $C_{27}H_{30}O_{17}$, giving, on hydrolysis, glucose, rhamnose, quercetin, and catechol tannin.[2] *Osyritrin* is identical with *Viola quercetrin*.[2] Sumach grown in the Cape yields a greater amount of tannins than that grown in the Transvaal.[1]

A decoction of the root of **Thesium hystrix A. W. Hill**, Wit-opslag, is taken in large doses for tuberculosis of the lungs and coughs. It is said to act as an expectorant. The Griquas, Chuanas, and Europeans take a decoction of the roots in large doses for kidney and bladder affections.

The Chuanas and Kwenas chew the stem of **Thesium utile A. W. Hill,** Chuana and Kwena *moeta-pele*, for gastric disorders.

An infusion of the leaves of **Thesium sp.,** Teringbos, is given to tubercular cases, but is said to produce no effect (Wicht). Natives use a decoction of **Thesium sp.** with the root of **Peucedanum magaliesmontanum Harv.** and the root of **Polygala tenuifolia Link.** as a refreshing bath. Juritz [3] states that a **Thesium sp.** is stringent, but supposed to be harmless.

The Sutos use four **spp. Thesium**: (i) Suto *marakalle*, (ii) and (iii) Suto *bohôhô, sebitsane*, (iv) *marakalle-a-manyenyane*, as remedies for chest colds, and

Thesium sp., *cf.* **Thesium angulosum DC.**, Suto *marakalle, disiu-di-lale*, for heartburn (Phillips).

REFERENCES

1. Bull. Imp. Inst., 1907, v, 354; 1913, xi, 421; 1928, xxvi, 314.
2. A. G. Perkins: J. Chem. Soc., 1897, lxxii, 1131; 1910, xcvii, 1776.
3. C. F. Juritz: Rpt. Senior Analyst for 1905, Cape of Good Hope, G. 43—1906, 43.

XXVI. GRUBBIACEAE

The leaf of **Grubbia rosmarinifolia Berg.**, Skilpadbos, is used as a bush or Cape tea in the same way as **Cyclopia vogelii Harv.**[1]

REFERENCE

1. R. Kobert: Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (2), 1028.

XXVII. OLACACEAE

The Zulus use a cold infusion of the leaves of **Ximenia caffra Sond.**, Sour plum, Wild plum, Natal plum, Suurpruim, Zulu *umThunduluka*, Tonga *umTunduku*, Kxatla *morokolo*, for application to the eyeball in inflammations. The Kxatlas administer a decoction, made frequently with **Homeria pallida**, to bulls to increase their potency.[7] The fruit kernels of both **Ximenia caffra** and **Ximenia africana** yield about 65 per cent. of a yellow viscous non-drying oil,[1] which is very pungent.[2] The seed of Ximenia caffra is used for tanning.

The ripe fruits of **Ximenia americana L.**, Sour plum, Wild plum, Wild olive, Wild lime, Mountain plum, Seaside plum, Citron of sea, Suurpruim, Wilde-pruim, Alimu (Sudan), are used by natives in the Transvaal for making beer, and the oily kernels are used for softening leather. In Rhodesia the natives give a hot-water extract of the roots to calves as a remedy for sanguineous diarrhoea. The kernels yield a yellow semi-drying oil, which is edible,[1, 3] though Marloth [2] says it is pungent. Ernst [4] states that they are purgative and poisonous, and yield *hydrocyanic acid*, but subsequent investigation of the leaves and kernels shows no sign of cyanogenetic glucoside.[1, 5] The kernels also contain no alkaloids.[5] The bark, ex Sudan, contains 16·9 per cent. of *tannins*.[6]

REFERENCES

1. Bull. Imp. Inst., 1917, xv, 313; 1919, xvii, 122.
2. R. Marloth: The Flora of South Africa, 1913, i, 165.
3. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 8.
4. —. Ernst: Arch. Pharm., 1867, clxxxi, 222, through ref. No. 1.
5. Anon.: J. Dept. Agr., Union of South Africa, 1925, 10, 44.
6. Bull. Imp. Inst., 1907, v, 354.
7. I. Schapera: So. Afr. J. Sci., 1930, xxvii, 559.

XXVIII. HYDNORACEAE

Hydnora africana Thunb., Bobbejaankos, Jakkalskos, Kannip, Hottentot *t'nau* (?), is used for tanning (Marloth). Thunberg states it is edible.

XXIX. POLYGONACEAE

The Xosas eat the boiled leaves of **Emex spinosa Campd.,** Dubbeltjiesblaar, Xosa and Zulu *in Kunzane*, for dyspepsia and biliousness and to stimulate appetite. Smith says it is purgative and diuretic. The Xosas also use a strong decoction of the leaves for thread-worms in horses. The Zulus use the plant as a remedy for stomach disorders and to relieve colic (Bryant).

Withered **Emex australis Steinh.,** Devil's thorn, Duiweltjiedoring, Dubbeltjiedoring, Duiweltjies, was at one time believed by the Cape farmers to be the cause of *geeldikkop* in sheep, but this is now known not to be the case.

The Sutos use a decoction of the root of **Rumex** *near* **Rumex ecklonianus Meissn.,** Smaller dock, Tongblaar, Suto *kxamane*, Xosa and Zulu *iDololenkonyana*, made with many other plants for the treatment of sterility. They also use a hot decoction of the plant for washing wounds and bruises. The Xosas use a milk decoction of the root as a tape-worm remedy. They sometimes chew the root and swallow the saliva for the same purpose. The Zulus use a cold infusion of the root for the same disease. Hewat states that natives use a milk decoction of the root for round-worms. The plant is mildly purgative.[1] containing *chrysophanic acid* and *emodin*.[2] It also contains a small amount of a *volatile oil*, and other bodies of no practical importance.[2] Neither alkaloids nor glucosides are present.[1, 2]

Natives use a decoction of **Rumex,** *prob.* **Rumex crispus L.,** Dock, Yellow dock, Curled dock, Narrow dock, Sour dock, Tongblaar, Xosa and Zulu *iDololenkonyana*, along with **Teucrium africanum Thunb.,** in the treatment of anthrax. Maurin [3] finds that the root contains 0·2 per cent., and the twigs a trace of *oxymethylanthraquinone*. Beal and Okey [4] found that the dried root yields 0·1 per cent. of *emodin*. and slightly less of *chrysophanic acid*, while Murayama and Itagaki [5] obtained 0·5 per cent. of *chrysophanic acid* and 0·12 per cent. of *emodin* from a dried alcoholic extract. It also contains an *essential oil* and other substances,[4] and *tannic acid* has been isolated from the plant.[6] The root is thus mildly purgative and mildly astringent. Pammel states that the plant yields *oxalic acid* and *rumicin*, $C_{14}H_{10}O_4$, a tasteless, golden-yellow substance, which is irritant, and has been used for destroying skin parasites. It has been found that if Rumex crispus L. is watered with carbonate of iron solution, the root may develop as much as 1·5 per cent. of iron in organic combination.[7] Tschirch and Weil [8] isolating 0·379 per cent. Such root has been used in doses of 1 to 3 grm. in anaemias.[7]

A strong decoction of the leaves of **Rumex nepalensis Spreng.,** Suto *kxamane-e-kxolo, pôta-ka-leleme, molokodi*, is used by Europeans in the Transvaal, in tablespoonful doses three times a day by the mouth, for bilharziasis. It is

said to be effective. The Sutos prepare a medicine for newly confined women from the plant (Phillips). The root, ex India, has been found to contain *chrysophanic acid* (rumicin) and much *nepodin* (nepalin, probably equal to diethylanthracatechol), and has been used as a rhubarb-root substitute.[6, 9] It is purgative, and is used in Madras as an astringent and for dyeing.[6]

In the Transvaal a poultice of the leaves of **Rumex acetosa L.,** Sour Dock, Sorrel, Suring, is used in treating abscesses. The plant contains *acid potassium oxalate* [10] and some *tartaric acid.*[6] Purdie [11] found 1·36 per cent. of *potassium binoxalate* in the juice. The plant has been used in the treatment of scurvy, but if eaten to excess, toxic effects from the oxalic acid may supervene.[6] Fatal cases of poisoning are on record.[12] The root contains 1·05 per cent., and the leaves a trace of *oxymethyl-anthraquinone.*[3] Pammel says that the plant is astringent.

Rumex acetosella L., Dock, Sheep sorrel, Sour dock, Sorrel, Boksuring, Steenboksuring, Suto *bodilanyana,* also contains *acid potassium oxalate* [10] and *tartaric acid.*[6] The plant, like Rumex acetosa, has been used in scurvy, and can produce oxalic acid poisoning if eaten to excess.

The Sutos prepare a medicine for diarrhoea in calves from **Rumex woodii N. E. Br.,** Suto *bodila-ba-likxomo.*

The rhizome of **Rumex cordatus Desf.** contains 10·93 per cent. of tannin.[1] The seeds of several species of **Rumex,** Tongblaar, are used as antidysenteric remedies.

A decoction of the root of **Polygonum tomentosum Willd.,** *var.* **glabrum,** is used by the Tembus in black-gall sickness in cattle. The plant is said to have caused the death of a native girl.[13] The root contains 2·5 per cent. of an acrid resin,[13, 14] which is a depressant, and stops the heart in systole.[13]

The Zulus apply a paste of the leaves of **Polygonum serrulatum Lag.,** Knotweed, to sores.

Thunberg mentions that **Polygonum barbatum L.** is acrid, and was used for "dropsical and swelled legs." The leaves are said to yield an indigo-like dye,[6] and Pammel states that the plant is astringent.

Polygonum fagopyrum Buch.-Ham., or L. (Fagopyrum cymosum Meisn. or Fagopyrum esculentum Moench) is apparently toxic to stock.[15]

REFERENCES

1. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 8, 17.
2. F. Tutin and H. W. B. Clewer: Proc. Chem. Soc., 1909, xxv, 302.
3. E. Maurin: Bull. Sci. Pharm., 1926, xxxiii, 138.
4. G. D. Beal and R. E. Okey: J. Amer. Chem. Soc., 1919, xli, 693, through ref. No. 6.
5. Y. Murayama and T. Itagaki: J. Pharm. Soc. Japan, 1921, 470, 327, through Chem. Abstr., 1921, xv, 2338.
6. United States Dispensatory, 1926, 21st Edition, 945, 946, 1229, 1414.
7. Merck's Berichte, 1906, xx, 236.
8. A. Tschirch and Weil: Arch. Pharm., 1912, ccl, 20, through ref. No. 6.
9. A. Tschirch: Handbuch der Pharmakognosie, 1917, ii (2), 1396.
10. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (1), 70.
11. I. A. Purdie: Pharm. J., 1927, cxviii, 105.
12. G. C. Flemyng: Lancet, 1896, i, 1642.
13. C. F. Juritz: Rpt. Senior Analyst for 1904, Cape of Good Hope, G. 59—1904, 38.
14. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1 905,
15. D. G. Steyn: J. So. Afr. Vet. Med. Ass., 1928, i (2), 49.

XXX. CHENOPODIACEAE

A decoction of red beetroot, **Beta vulgaris L.**, is taken in large quantities as a purgative by sufferers from haemorrhoids. The action is probably due solely to the large amount of sugar taken in. The eating of quantities of red beet by a child is recorded as producing a brilliant red coloration of the urine, ascribed to the excretion of anthocyanins.[1]

The Sutos and Zulus use an infusion of **Chenopodium ambrosioides L.**, Mexican tea, Stinking goosefoot, American wormseed, Mexican grape herb, Jesuits tea, Sinkingbossie, Suto *setla-bothša*, *setlama-se-habea*, *mokxankxa*, *poya-e-kxolo*, Fingo *um Hlahlampethu*, *im Bikicane* (generic native name for Chenopodia), the former for colds and stomach-ache, the latter more commonly as an enema for intestinal ulceration. It is said to produce sweating. The Zulus sometimes use the plant mixed with **Chenopodium album L.** The Xosas use the seeds as an insecticide, usually as a powder, but sometimes as a decoction mixed with a decoction of blue-gum leaves. Pappe, as far back as 1868, describes the plant as having a strong aromatic smell and a pungent, bitter taste: he thought that it contained a volatile oil. He mentions that an infusion is antispasmodic, diaphoretic, and anthelmintic. The active principle is *oil of chenopodium*, a volatile oil obtainable by distillation. The plant, when in flower, yields 0·33 per cent. of the oil.[2] This contains 45 to 70 per cent. of *ascaridol*.[2] Some writers ascribe the action of the oil to its ascaridol content, but others think ascaridol is less efficient and more irritant than the fraction of the oil which distils at a lower temperature.[3]

Oil of Chenopodium is a well-known anthelmintic, used particularly in ancylostomiasis (hook-worm disease). It is efficient, and has a low toxicity in man. On the other hand, a number of cases of poisoning are on record in many of which the issue was fatal.[3]

Chenopodium album L., Goosefoot, White goosefoot, Lamb's quarters, Common pigweed, Varkbossie, Zulu *um Bikicane*, Suto *serue*, is used by the Zulus in the same way as **Chenopodium ambrosioides L.** The finely powdered leaves are used as a dusting powder for irritation about the external genitalia in children. Phillips records that the plant is edible. It is a rare cause of hay fever in South Africa.[4]

A paste of the leaves of **Chenopodium vulvaria L.** is used as a styptic. The plant contains *trimethylamin*, $(CH_3)_3N$, which is a decomposition product of *cholin*.[2, 5] Pammel says that it is anthelmintic.

Europeans and Natives use a milk decoction of the leaves of **Exomis axyrioides Fenzl.**, Hondebos, *umNqunduwenyathi*, in the treatment of epilepsy. Smith and Hewat mention a similar use, and state that a watery decoction produces stupor.

Suaeda fruticosa Forsk., Inkbush, Shrubby saltwort, Inkbos, is said to produce a persistent black diarrhoea, and death, in sheep.[6] Apparently sheep not accustomed to the plant will eat it.[6]

Salsola aphylla L. f., Brakganna, Soutganna, Kanna, Ganna, has been used to supply the alkali for soap-making (Thunberg), and is of great importance as

a fodder plant.[7] Marloth gives a chemical analysis of the plant, showing that it yields 22·7 per cent. of ash.[8]

Salsola kali L., Saltwort, Russian thistle, Russian tumble weed, contains a considerable amount of potassium salts and also oxalic acid.[9] The plant has been suspected of causing deaths among cows, but a feeding test in sheep proved negative.[6] The sharp spines may pierce the skin of stock, producing septic sores.[6]

REFERENCES

1. J. A. Mease, Jr.: J. Fla. Med. Ass., 1927, xiii, 291, through Chem. Abs., 1927, xxi, 3981.
2. A. Tschirch: Handbuch der Pharmakognosie, 1923, iii (1), 33, 127.
3. T. Sollmann: Manual of Pharmacology, 1926, 3rd Edition, 244.
4. J. H. Harvey-Pirie: J. Med. Ass. So. Afr., 1928, ii, 374.
5. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (2), 1116.
6. D. G. Steyn: 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 781, 782.
7. R. Marloth: The Flora of South Africa, 1913, i, 183.
8. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 19.
9. J. Zelliner: Monatsch. Chem., 1927, 47, 611.

XXXI. AMARANTACEAE

The Tongas use **Sericocoma avolans Fenzl.** (Cyphocarpa zeyheri Lopr.), Tonga *tlabatlane*, in the treatment of rheumatism (de Almeida).

Cyphocarpa angustifolia Lopr. is thought on one occasion to have caused a death when it was administered as a medicine.[1]

The Sutos drink a decoction of the roots of **Cyathula globulifera Moq.,** Klits, Suto *bohome, bohome-bo-boholo*, Pedi *maime*, for "stricture" of the urethra, and they also use the roots as soap. The Pedis use the root in witchcraft.

Cyathula spathulifolia Lopr. is used as a leprosy cure in Portuguese East Africa, apparently with very good results. An ointment is prepared from the stem, fruit, and seed by washing and powdering and mixing them with castor oil, or the oil from Trichilia emetica seeds. This ointment is vigorously massaged into the sores. At the same time a decoction of the leaf of **Bridelia schlechteri Hutch.** is taken internally.

The Zulus, in cases of infertile marriage, use the flowers of **Pupalia sp.,** Zulu *isiNama-esibomvusehlathi*. They are bruised and made into small balls, one being eaten by the man, the second being inserted into the vagina of the woman.

The Zulus use an infusion of the roots of **Achyranthes aspera L.,** Klits, Zulu *isiNama*, Chuana and Kwena *moxato*, Suto *bohome-bo-bolelele, mokxoatha-kxwale, lenamo, bohomane*, as an emetic for pains in the chest not due to cough. The Kwenas and Chuanas inhale the steam from boiling the plant, and also use it in a hot bath for acute chills. The treatment causes sweating, as would be expected.

REFERENCE

1. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 195.

XXXII. NYCTAGINACEAE

The root of **Mirabilis jalapa L.,** Marvel of Peru, Four o'clock, Vieruurblom, is apparently purgative,[1] but this action is not due to the presence of oxymethylanthraquinone.[1] At night the flowers exhale a strong odour which is said to stupefy or drive away mosquitoes.[2]

REFERENCES

1. E. Maurin: Bull. Sci. Pharm., 1925, xxxii, 27.
2. F. M. Guignones: La Rivist. Agric., 1918, xiv., 142, quoted in So. Afr. J. Sci., 1918, xv, 190.

XXXIII. PHYTOLACCACEAE

Lineum capense Thunb. is used in making a "Kaffir beer," and it is said to be an acrid, though not very active, poison.[1]

Semonvillea sp. has been suspected of causing fatal poisoning in cattle in the Hoopstad district.[2]

The crushed root of **Psammotropha androsacea Fenzl.,** Suto *mothujwane, senama*, is boiled and rubbed by the Sutos into incisions round the waist, legs, arms, and forehead for the treatment of constipation (Phillips).

Powdered **Psammotropha myriantha Sond.,** Kwena and Chuana *makxa*, is used by the Kwenas and Chuanas in making a perfumed ointment.

Phytolacca americana L., formerly known as Phytolacca decandra L., Kermes bush, Pokeweed, Poke, Pigeon berry, Garget, Scoke, Pocan, Coakum, Virginian poke, Ink-berry, Red-ink-berry, American nightshade, Cancer jalap, Redweed, Phytolacca, Karmosynbos, occurs in South Africa, and is used medicinally by natives. In the United States of America the root and berries have been used in the treatment of skin and blood diseases, and the root was at one time official in the United States Pharmacopoeia.[3] The berries are poisonous, inodorous, and have a sweetish and, later, acrid taste.[3] * The root is also poisonous,[3, 4] is slightly odorous, and has a sweetish and then acrid taste.[3] Both produce purgation and vomiting.[3] Pammel says that the root is narcotic, emetic, and cathartic in action, and that the poisonous principles are an acrid alkaloid, *phytolaccin* and *phytolaccotoxin*, $C_{24}H_{38}O_8$. The latter is said to resemble *picrotoxin* and *cicutoxin*. He states, further, that the plant contains *potassium oxalate*, and that a tincture is used for rheumatism. Later work records that the root yields (1) to petroleum ether 1·75 per cent. of an *oily mass* with a characteristic odour and taste; (2) 0·16 per cent. of an unknown *alkaloid*, obtained as a yellowish, gummy, non-crystallisable varnish; (3) 0·8 per cent. of a *volatile oil* with a characteristic odour and a pungent taste; and (4) 0·21 per cent. of *potassium nitrate*. No details are given of the action of the alkaloid.[5]

Fatal cases of poisoning by **Phytolacca americana L.** are on record, and Pammel describes the symptoms as a violent but slowly produced emesis, the vomiting commencing after two hours. This is followed by much retching,

* The ripe berries are not toxic to chickens. (Hendrickson and Hilbert: Vet. Bull., 1931, i, 174.)

severe purging, and, sometimes, convulsions. Death is often due to respiratory paralysis.

Phytolacca abyssinica Hofm., Zulu *uMahedeni, inGub'-ivumile, schepti* [6] (Abyssinian name for the fruit), is used by the natives in Rhodesia as a "war medicine" (Dornan), and in Abyssinia as a tape-worm remedy.[6] The Zulus use the leaves and root as an emetic in febrile conditions and in the treatment of genito-urinary diseases, the administration producing sweating, vomiting, and purgation (Bryant). Bryant states that the plant is poisonous. The fruit contains a toxic *saponin* [6, 7] and *tannic acid.*[7] Marloth [8] and Pammel state that the root contains a red colouring matter in addition to a saponin.

The Xosas administer the root of **Phytolacca heptandra Retz.,** formerly known as **Phytolacca stricta Hoffm.,** Umbra tree, Wild sweet potato, Xosa *umNyanja*, Native *umNyangi, umNyanji, monatja, monatswana*, to cattle for the treatment of "lung-sickness." It is also used by the Xosa witch-doctors as an emetic, and Smith and Phillips state that the root is poisonous. The fruit is edible (Phillips). Native women who are pregnant make periodic prophylactic use of the strong purging action of the root in order to prevent their children being born with birth-marks. According to Hewat, natives make constant use of the plant as an emetic in chest diseases, and small doses are taken internally; the plant is applied externally in snake-bite. Natives also use the plant as an emetic in cases of delirium. In Rhodesia the plant is used as a "war medicine" (Dornan). Marloth [8] and Pammel state that the root contains *saponins*, and is poisonous.

The wood of **Phytolacca dioica L.,** Belombra tree, Belhambra tree, contains *tannins.*[9] Reichert [10] investigated the leaf, and states that it contains *saponins.* These have been investigated pharmacologically,[11] but we have been unable to find details of the work.

REFERENCES

1. C. F. Juritz: Agr. J., Cape of Good Hope, 1906, xxviii, 35.
2. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 199.
3. United States Dept. Agr.: Farmers' Bull., No. 188, 1904, 20.
4. R. Marloth: The Flora of South Africa, 1913, i, 191.
5. G. L. Jenkins: J. Amer. Pharm. Soc., 1929, xviii, 573, through Chem. Abs., 1929, xxiii, 3775.
6. Anon.: Pharm. Ztg., lviii, 709, through Chem. Abs., 1913, vii, 3817.
7. R. Kueny: Arch. Pharm., 1914, cclii, 350, through Chem. Abs., 1915, ix, 121.
8. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 8.
9. J. A. Dominguez: Anales soc. quim. Argentina, 1917, v, 113, through Chem. Abs., 1918, xii, 1066.
10. F. Reichert: Anales soc. quim. Argentina, 1927, xv or xxv, 221, through Chem. Abs., 1928, xxii, 844, and Chem. Zent., 1928, i, 1295.
11. I. Sopeña: Mentioned in ref. No. 10.

XXXIV. AIZOACEAE

Pharnaceum lineare Linn. f., Droedas-kruie, was used by the early colonists as an infusion in pulmonary affections, especially tuberculosis. Pappe says that the preparation is rather pleasant, aromatic, bitter, and mucilaginous, and that it is diuretic.

A decoction of **Galenia africana L.,** Kraalbossie, Geelbos, Hottentot

d/kooi dabee, is used as a lotion for wounds in man and animals. The Hottentots chew the plant to relieve toothache, and it is said to blister the mucous membrane of the mouth if used too much (Laidler). The plant is also used in the treatment of venereal diseases. De Kock [1] mentions that in the Uniondale Road area it is thought by farmers to cause *waterpens* in small ruminants. This condition is characterised by the development of an extensive ascites, and seems to be associated with some form of cirrhosis of the liver. Feeding experiments with stock proved negative, but this may have been due to too small an amount of the plant being used.[1]

The boiled fruit of **Mesembrianthemum acinaciforme L.,** Sour fig, Hottentot's fig, Elandsvye, Gouna, Strand-vy, Suurvy, Hotnotsvy, Gaukum, is used in the treatment of pulmonary tuberculosis and other internal chest conditions, sore throats, and sore mouths. The leaf juice is used as a mouth-wash and gargle, and as a wash for sores. Wicht says that the leaf juice is astringent, and contains *malic* and *citric acids* and their calcium salts. The leaf juice has also, apparently, been used in dysenteries as a diuretic and as a styptic (Pappe). Pappe states that the leaf juice was also made into lotion for burns and scalds.

Mesembrianthemum tortuosum L., Kougoed, Kon, Channa, is used as a narcotic drug by natives in the Queenstown district. In former times the Cape farmers used a decoction or a tincture as a sedative (Pappe). It has also been used as an opium-like intoxicant [4] (Pappe). Laidler records that Hottentots chew the leaves for toothache, and for pains in the abdomen, and says that the plant is strongly narcotic. Juritz [5] has found in the plant a *volatile oil* with a peppermint-like odour, and states that the plant is soporific, causes dilatation of the pupil, and lessens sensation. Meiring [4] isolated a narcotic alkaloid. Zwicky [6] has carefully investigated the plant, and has, like Meiring, isolated an amorphous alkaloid, *mesembrine*, $C_{16}H_{19}O_4N$, melting at 93° F. The leaves contain 0·3 and the stems and roots 0·86 per cent. of the alkaloid. He states the action of the alkaloid somewhat resembles that of *cocaine*. It produces depression of the central nervous system in the frog, the rabbit, and man, preceded in the case of the rabbit by convulsions. In animals, death is by paralysis of the respiration. The local anaesthetic action is much weaker than that of cocaine. Zwicky himself took 0·15 grm. in dilute hydrochloric acid, the effects being a feeling of congestion of the head, noises in the ears, tiredness accompanied by slight tremors, headache, general depression, and loss of appetite. There was apparently no period of stimulation as is seen in the rabbit. The epidermis of the leaves contains a wax. According to Zwicky,[6] **Mesembrianthemum expansum L.,** Channa, has the same action and contains the same active principle (*mesembrine*).

The root of **Mesembrianthemum mahoni N. E. Br.,** Khadi, is used by the Bantu in making an intoxicating beer,[7] and by Europeans as a yeast for bread-making.[8] It is also poisonous.[8, 9, 10] The root contains *oxalates*, equivalent to 3 per cent. of *oxalic acid*,[8] to which the toxic action is due. It is dangerous to use the root as yeast, because a large amount must be used, thus introducing dangerous amounts of oxalates into the bread.[9] The fermenting action is due to a yeast and two moulds, one of the moulds producing a large amount of

oxalic acid when grown in sugar solution.[9] The root contains neither glucosides nor alkaloids.[9]

The Sutos use the ash of a **Mesembrianthemum sp.,** *near* **Mesembrianthemum mahoni N. E. Br.,** Suto *sebabetsane, mabone, monontswa, leqhwaba,* to insert into incisions on the feet to relieve soreness and swelling (Phillips).

Mesembrianthemum stellatum Mill., Kieriemoer, Kocriemoer, Karremoer, is used as a yeast substitute in making bread [11] and by natives in brewing beer.[7] Laidler states that the root has a delirient and intoxicating effect, and Zwicky [6] that the plant contains an alkaloid (*mesembrine* ?).

The dried leaf of **Mesembrianthemum crystallinum L.,** Ice plant, Diamond fig, Brakslaai, Slaai, Soutslaai, Slaaibos, Nama Hottentot *n/nhoo, n/nghoop,* is used by the Hottentots for taking the hair off skins (Laidler). In Europe the plant has been used as a dysentery, liver, and kidney remedy, and as a gargle,[3] and the ash has been used as a soda substitute.[3] Pappe says the plant contains *malic acid* and *lime.* According to the United States Dispensatory,[12] the plant is considered to be demulcent and diuretic, and has been used in the treatment of inflammations of the pulmonary and genito-urinary mucosae. Mangon [13] obtained 43 per cent. of sodium and potassium salts from the dried leaves, and *potassium oxalate* has been isolated from them.[12] In Morocco [14] and in Abyssinia [15] the plant is used in soap-making, probably on account of the large amount of alkali it contains. Holmes,[14] however, is of the opinion that the cleansing effect of the plant is due to saponin. Zwicky [6] isolated an alkaloid (*mesembrine* ?).

Mesembrianthemum acutilobum N. E. Br., Khadi, is used in the Transvaal in making kaffir beer [10]; **Mesembrianthemum spinosum L.,** Spiny vyebos, Doringvy, is used as fodder [10]; and the ash of **Mesembrianthemum micranthum Haw.,** Asbos, Loog, Xosa *iQina,* according to Smith and Marloth,[16] is used by natives, particularly the Hottentots, in making soap.

The root of **Mesembrianthemum acutipetalum N. E. Br.,** Khadi, is used for making kaffir beer in the Transvaal, and **Mesembrianthemum arachnoideum** (*sic*) is said to have very powerful properties, but we lack details of this.

The juice of **Mesembrianthemum sp.,** *cf.* **Mesembrianthemum pulchellum Haw.,** Suto *sebabetsane,* is applied by the Sutos to scabby conditions of the skin.

Several species of **Mesembrianthemum** which have not been fully determined are used in a variety of ways. Thunberg records that the early colonists administered an infusion of the fruit of **Mesembrianthemum sp.,** Rosa de Jericho, to pregnant women near term to assure an easy delivery. An infusion of the leaf of **Mesembrianthemum sp.,** Muishondblaar, is drunk by Europeans, and the leaves applied locally for the treatment of skin sores. The Zulus use an enema of a **Mesembrianthemum sp.,** Zulu uGebeleweni, for stomach troubles. A similar preparation is sometimes drunk as an emetic, and the ash of this species is used by the Zulus to insert into incisions made over various parts of the body which are painful. According to Bryant, the Zulus use an infusion of the leaf of **Mesembrianthemum sp.,** iKhambilamabulawo (generic Zulu name for Mesembrianthemum spp.) to relieve the fearful dreams apparently accompanying heart weakness. In the Transvaal, a mixture of the juice of the leaf

of a Mesembrianthemum sp. and the juice of a Tragia sp. is taken in the treatment of syphilis.

Sceletium anatomicum (Haw.) Bolus (Mesembrianthemum anatomicum Haw., Mesembrianthemum emarcidum Thunb.), Kon, Canna, Kanna, Guena, Kougoed, according to Thunberg, was prepared by the Hottentots for chewing by beating together the whole plant (roots, leaves, etc.), twisting together like " pig-tail " tobacco, and allowing the mass to ferment. It was chewed especially to quench thirst. If chewed immediately after fermenting, the preparation intoxicates. The Bushmen apparently smoked the plant after chewing. Dragendorff [3] states that the plant has been used as a light narcotic, while Pammel quotes Greshoff as stating that it has this action. This is interesting in view of the fact that Bushman mothers administer a drop of the fresh juice to infants to quieten them. We are informed that it makes children sleep for as long as five hours. Bushmen chew the plant as an intoxicant, the action being persistent and strong. Coloured people in the Willowmore district use the juice as a sedative.[17] Steyn administered the plant to two rabbits, which showed no effects.[17]

A **Psilocaulon sp.** (So. Afr. National Herbarium, No. 8819) has been suspected of being the cause of poisoning in goats in the Willowmore district, tests in rabbits proving inconclusive.[17]

The fruit and leaves of **Carpobrotus edulis N. E. Br.,** *formerly* Mesembrianthemum edule L., Hottentot's fig, Vyerank (Lokenburg), Gaukum, Hotnotsvy (g) Perdevy, Suur-vy, has been widely used for various disease conditions since the time of Thunberg (1770). The strained juice from pounded leaves is used as a gargle for all kinds of sore throats, for thrush in infants, for digestive troubles, and as a treatment for diarrhoeas and dysenteries. The fruit is said to be laxative, but is also used in making a jam. Cloths soaked in the leaf juice are used for dressing burns, and sometimes an ointment made by melting together the juice, " Haarlem " oil, castor oil, and lard is used for the same purpose. A recipe for tuberculosis is leaf juice 1, olive oil 1, honey 1, well shaken together, the dose being a wineglassful three times a day. A gargle for sore throats is made by mixing the juice with vinegar and honey. A decoction of the leaf is used in the Transvaal as a gargle in diphtheria. Kolb [2] states that an infusion of the fruit was used by Hottentot women during pregnancy to ensure an easy birth, and that they were in the habit of smearing the leaf juice over the new-born infant to make it strong and nimble.

Pappe mentions that the leaf juice was taken in dysenteries, and produced a mild diuretic action; that on account of its antiseptic properties it was excellent in malignant sore throat (diphtheria ?), violent salivation, and aphthae, and as a lotion for burns and scalds. Wicht says the leaf juice is astringent, and contains *malic acid, citric acid,* and their *calcium salts.* Sheep are fond of the herbage, the eating of which does not seem to harm them.

A **Mesembrianthemum sp.,** *probably* **Carpobrotus edulis N. E. Br.,** Suto *moriana-wa-ditsebe,* is applied in the form of a powder, or mixed with fat, for diseases of the ear.

For the treatment of the climacteric in women, the Chuanas administer a decoction of the root of **Delosperma herbeum N. E. Br.,** Chuana *lemelanthufe.*

REFERENCES

1. G. de Kock: J. So. Afr. Vet. Med. Ass., 1928, i (2), 30.
2. P. Kolb: Beschreibung des Vorgeburges der guten Hoffnung, 1745, 141.
3. G. Dragendorff: Heilpflanzen, Stuttgart, 1898, 204. E. M. Holmes: Pharm. J. and Trans., 1874, 810. Both through ref. No. 6.
4. T. Meiring: Trans. So. Afr. Phil. Soc., 1898, ix, 48.
5. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 231.
6. E. Zwicky: Über channa. Dissertation Zürich, 1914.
7. C. F. Juritz: Cape Agr. J., 1906, xxviii, 35.
8. Bull. Imp. Inst., 1912, x, 300.
9. Bull. Imp. Inst., 1916, xiv, 37.
10. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 8, 19.
11. J. Burtt-Davy: So. Afr. J. Sci., 1912, 194.
12. United States Dispensatory, 1926, 21st Edition, 1382.
13. H. Mangon: Amer. J. Pharm., 1883, 370, through ref. No. 12.
14. E. M. Holmes: Pharm. J., 1918, ci, 317.
15. E. Wilczeh: Schweiz. Apoth. Ztg., 1918, 56, 521, through ref. No. 14.
16. R. Marloth: The Flora of South Africa, 1913, i, 198b.
17. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, Part II, 707, 708.

XXXV. PORTULACACEAE

The Sutos and Zulus take an infusion of the crushed root of **Talinum caffrum E. and Z.,** Zulu *imPunyu, imPunu,* Suto *khutsana,* by the mouth for nervousness and stomach-ache. The medicine is said to produce sweating. The Zulus use an infusion of the root as an emetic in chest troubles and as an enema in abdominal disorders. For stomach upsets in children, they administer an infusion of the leaves which is said to be soapy to touch.

Natives in Rhodesia use **Anacampseros rhodesica R. Br.,** *inQilinko,* in the treatment of blackwater fever, malaria, blood-poisoning, anthrax, and dysentery (Dornan), and the plant is said to be poisonous.

The Sutos use **Anacampseros arachnoides Sims.,** Suto *seredile,* medicinally, and the plant is said to be emetic (Phillips).

Anacampseros ustulata E. Mey., Hasieskos, Moerplantjie, Xosa *iGwele,* is used in making a kaffir beer.[1] On suspicion of its being toxic, **Anacampseros telethiastrum DC.** was drenched to a sheep without effect.[2]

The Zulus use an infusion of **Portulaca quadrifida L.,** Port. East Africa *sanimarumbi,* as an emetic. In Portuguese East Africa, the natives take a decoction of the plant with **Monadenium lugardae N. E. Br.,** and another plant (undetermined) as an anthelmintic, and in the treatment of stomach complaints and gonorrhoea.

Portulaca oleracea L., Purslane, Misbredie, Porselein (Postelein), Varkkos, Suto *selêlê,* the common or garden Purslane of Europe, occurs in South Africa. Here it is used as a charm by the Sutos; but in North America it has been considered a cooling diuretic,[3] and the seeds at one time were thought to be anthelmintic, though now known to be inert.[3] The plant is edible.

REFERENCES

1. C. F. Juritz: Cape Agr. J., 1906, xxviii, 35.
2. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 799.
3. United States Dispensatory, 1926, 21st Edition, 1435.

XXXVI. CARYOPHYLLACEAE

Polycarpaea corymbosa Lam. is used medicinally by native doctors in the Northern Transvaal, but we do not know for what purposes.

Natives in the Transvaal use a decoction of **Pollichia campestris Soland.,** Kaffer-druiwe, Suto *letswai, sefakwana, monokotswai-wa-makxwaba, tšemo-ya-mayókolo,* as a refreshing addition to the bath, and apply it as a liniment to swellings and bruises. For the relief of asthma, the Sutos inhale the steam from a hot decoction, the inhalation being followed by massage with the lukewarm fluid (Beyer). The fruits are edible, and are eaten by Suto children (Phillips). Burtt-Davy [1] says the plant is greedily eaten by stock, and that the fruits are white, fleshy, edible, and pleasantly flavoured—rather like white mulberries.

The Sutos use a decoction of **Herniaria hirsuta L.,** Suto *tlokofilwane-e-nyenyane, tlokofilwane-ya-lekwéba,* for sore throat. The Sutos give a decoction of the root to horses for bots and for colds, the treatment resulting in purgation. Kobert [2] says the plant contains *saponins* and *cumarin,* and is diuretic. Cumarin is an odoriferous principle, but it is said to be toxic, causing, in large doses, nausea, vomiting, vertigo, depression of the heart, and coldness of the extremities.[3] Whitla [4] says it is powerfully "narcotic and very irritating to the stomach."

Agrostemma githago L., Corncockle, Koringroos, has been introduced into South Africa. The seed is toxic to stock [5] and man,[2, 3] producing in each case poisoning as a result of its inclusion in food-stuffs. The symptoms are those of gastro-intestinal irritation.[2] The seeds contain from 4·9 to 7·7 per cent. of toxic *saponins.*[6, 7] Some difference of opinion exists regarding the formula of this *agrostemma-saponin,* Brandl [8] stating that the sapogenin is $C_{35}H_{54}O_{10}$, while Wedekind and Schicke [9] give $C_{29}H_{44}O_4$, melting at 286° to 287° C. Brandl and Vierling [6] record that the saponin produces haemolysis in a dilution of 1 : 50,000, is local anaesthetic, and on injection into frogs, rabbits, dogs, and pigs causes paralysis of the central nervous system, involving more particularly the respiratory centre. The sapogenin produces similar effects more slowly, but the corresponding dose is higher.

The Sutos use **Silene capensis Ott.,** Suto *molokoloko, letomokwana, dikômana, dithotwana, šetla-la-morôka, kwaqela,* as a medicine in many diseases, particularly in fevers and delirium (Phillips). They also use **Silene burchellii Ott.,** Suto *lepatla, dithotwana,* in making various medicines. Other natives use the plant as a tonic bath after serious illness, and to combat sleepiness.

The Zulus use an infusion of the root of **Dianthus crenatus Thunb.,** Zulu *isiDala,* with **Tephrosia lucida Sond.** as an emetic. This is accompanied by washing of the face with the froth which rises from the infusion. The treatment is used where an unmarried person of either sex fails to find a mate.

In the North-West Cape Province a paste of the powdered root of **Dianthus scaber Thunb.,** Wild pink, Grashout, Wilde angelier, Suto *tlokofilwane,* is applied to sores, cuts, and cancers, and an infusion of the root is drunk for stomach complaints. Sutos use the plant as a medicine for chest pains (Phillips). According to Smith, the root of **Dianthus sp.,** Pink, and the root of **Agapanthus sp.** are beaten up in cold water and the froth applied as a fomentation for

severe colic and for stitch. In addition, a mere trace of the liquid is taken by the mouth.

According to Burtt-Davy,[10] the seed of **Vaccaria vulgaris Host.**, Cockle, China cockle, Spring cockle, Cow basil, Cow foot, Glond, Soapwort, contains a *sapotoxin*, and is somewhat toxic to stock.

REFERENCES

1. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 215.
2. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (1), 147; ii (2), 749, 754.
3. L. H. Pammel: Manual of Poisonous Plants, 1911, 440, 552.
4. Wm. Whitla: Pharmacy, Materia Medica and Therapeutics, 1923, 11th Edition, 552.
5. J. Brandl: Arch. exp. Path. u. Pharm., 1908, lix, 299. L. Neumayer: Arch. exp. Path. u. Pharm., 1908, lix, 311. Both through Chem. Abs., 1909, iii, 204.
6. J. Brandl and E. Mayr: Arch. exp. Path, u. Pharm., 1905, liv, 245. J. Brandl and A. Vierling: Arch. exp. Path. u. Pharm., 1905, liv, 245, through Chem. Zent., 1906, x, 1350.
7. E. Wedekind and R. Krecke: Zeit. physiol. Chem., 1926, clv, 122, through Chem. Abs., 1927, xxi, 384.
8. J. Brandl: Arch. exp. Path. u. Pharm., 1908, lix, 224, through Chem. Abs., 1909, iii, 210.
9. E. Wedekind and W. Schicke: Zeit. physiol. Chem., 1929, clxxxii, 72, through Chem. Abs., 1929, xxiii, 3475.
10. J. Burtt-Davy: Transvaal Agr. J., 1905, iii, 294.

XXXVII. RANUNCULACEAE

In the Transvaal the crushed fresh leaves of **Anemone transvaalensis (Szysz) Prantl.** are sniffed to relieve headache, and a decoction of the leaves is used as a lotion for festering wounds and to relieve poisonous bites. The fresh crushed leaves have been found to blister the skin. Brandwijk and Watt [1] have investigated the properties of the plant with the following results. The fresh leaves contain 0·274 to 0·283 per cent. of *anemonol*, a white crystalline body which has been found in other Ranunculaceae. Both the fresh leaves and anemonol prepared from them are strongly irritant and blister the skin. Anemonol decomposes readily into *anemonin* and *iso-anemonic acid*, neither of which is irritant. The leaves, when dried, lose their irritant properties on account of this decomposition. Anemonin resembles cantharidin closely in chemical structure. Neither the leaves nor anemonol is suitable for use in medicine as a blistering agent, because the action is too drastic, too penetrating, and too slow in developing, and because anemonol decomposes very readily, thus necessitating the use of *fresh* leaves. The use of the decoction described is illogical, as it is non-irritant, and contains neither tannin nor alkaloids which might exert a beneficial local action.

The Zulus use an infusion of the root of **Anemone caffra Harv.**, Anemone, Anemoon, Zulu *inTingwe*, Xosa *iYeza-elimnyama*, as an emetic or an enema in the treatment of biliousness. According to Hewat and Smith, natives, in general, use the powdered root as a snuff to relieve headache; if this fails, they inhale the smoke from burning the root, while a paste of the leaves is applied to the painful part. Smith states that the plant has been used with **Athrixia heterophylla Less.** in the treatment of madness.

An infusion of the leaves of **Knowltonia gracilis DC.** (Adonis gracilis Poir.), Zulu *uXaphusa*, is used by the Zulus for syphilis. It is either taken by the

mouth or injected as an enema. For headache they inhale the smoke from burning the leaves.

The leaves of **Knowltonia vesicatoria Sims.** (Atragene vesicatoria or Adonis vesicatoria Linn.), Blistering leaves, Brandblare, Kaatjiedrieblaar, are very generally used as a vesicant, especially in rheumatism and lumbago. The leaves are more effective when fresh. The plant is acrid.[2] Thunberg and Pappe note that the root is irritant as well as the leaf, the former stating that the resultant sore heals very slowly. The coloured people in the Bellville district drink a hot infusion of the root of the plant and the root of **Pelargonium grossularioides Ait.** (*var.*) in large doses for colds and influenza. It produces free perspiration.

Knowltonia bracteata Harv., *montuza*, is also acrid, and is said to have been one of the factors causing death in a native.[2, 3] The plant contains a fair amount of *resin*, which, however, is inactive.[2, 3]

Knowltonia rigida Salisb., Kaatjie-drieblaar, is acrid,[2] and like Knowltonia vesicatoria, is used in the treatment of rheumatism and lumbago, usually as a vesicant.

The early colonists at the Cape used **Adonis capensis** (Adonis vesicatoria L. f.) instead of cantharides,[8, 9] and as a remedy in sciatica and rheumatism,[8] probably by local application. This plant is now either Knowltonia rigida Salisb. or Knowltonia gracilis DC.

Clematis brachiata Thunb., Travellers' joy, Old man's beard, Klimop, Zulu *umDlonzo*, Suto *morara*, *morarana-oa-maféhlo*, Xosa *iTyolo*, Tonga *mienu maamba*, is used medicinally. A decoction of the roots is one of the ingredients in a Suto syphilitic remedy. The Zulus use an infusion of the leaves and stems by the mouth, or as an enema in abdominal disorders. The Xosas bruise the stems and sniff them to clear the head in bad colds (Smith). This inhalation induces sneezing on account of the pungency of the plant. An infusion of the shoots and leaves is used with other ingredients for the treatment of bots in horses. Hewat states that natives use a decoction or an infusion as a remedy for chest complaints. The Rongas use a hot decoction for steaming patients suffering from malaria and colds. The decoction is often drunk in addition. Sometimes a few drops of the juice of the plant are inserted into the nostrils in severe head colds. According to Pammel, the plant is a vermifuge, and Burtt-Davy [4] says it is acrid. The latter records also that drenching experiments in cattle proved toxicologically negative.[4] Steyn [10] records similar negative results in the goat. When chewed, the leaves produce a burning feeling in the mouth. The root of a **Clematis sp.,** *prob.* **Clematis brachiata Thunb.,** Pedi *maxope*, is sniffed by the Pedis to relieve headache. It has a strong, pungent odour.

The Wembas of Northern Rhodesia place the hot burnt end of a stick, cut from **Clematis sp.,** *prob.* **Clematis kirkii Oliv.,** Wemba *mutewetewe*, into hollow teeth to relieve toothache. We are also informed that they insert the powdered leaves of **Clematis sp.** (=MacDonald 3711 in South African National Herbarium, and named **Clematis kirkii Oliv.**), Wemba *nyenu*, into the nose to alleviate cold in the head. The treatment causes intense sneezing.

The Swazis use the leaf, flower, and root of **Clematis stewartiae Burtt-Davy** as an ingredient of an infusion given in cases of syphilis.

In the Nelspruit district, natives bruise and sniff the root of a **Clematis sp.,**

Travellers' joy, for headache, and in the Barberton district a poultice of the leaves of a **Clematis sp.** is applied over enlarged spleens to reduce their size, Natives often add a small amount of a powdered **Clematis sp.,** Suto *bogopa* (?), to a cold bath, which is used as a tonic treatment during convalescence.

Clematopsis stanleyi Hutch. and **Hermannia botanicaefolia E. and Z.,** Kwena and Chuana *lesokolla*, are used together in the form of a decoction for chest diseases, particularly in cases exhibiting haemoptysis.

Although it is an introduced plant, **Ranunculus pinnatus Poir.** (Ranunculus pubescens Thunb.), Buttercup, Botterblom, Kankerblare, Zulu and Swazi *uXaphosi*, Zulu *uXhaphozi*, Suto *hlapi*, is widely used as a medicine in South Africa. The Zulus, according to Bryant, take small doses of the powdered leaf and stem in water by the mouth for cough, and apply a poultice of the leaf over the bladder for urinary troubles, having first anointed the skin with oil or fat. A similar poultice is applied to venereal sores. The Swazis and Transvaal Zulus use the plant internally for syphilis, and apply the burnt and powdered plant to syphilitic sores. The Sutos regard the plant as being very poisonous, and state that it often kills sheep when eaten by them. The Xosas drink a weak decoction of the plant for stomach disorders, especially when vomiting is severe (Smith). They also use a milk decoction of the root as an internal remedy for bad cough and for sore throat, and if they have caught a chill, apply the bruised leaves in water to the skin. Pappe states that in former times the European colonists applied the fresh juice of the plant to cancerous ulcers. The plant is hot when chewed, and produces a considerable degree of irritation in parts to which it is applied. Taken internally, it is said to be mildly purgative. Experimentally, the plant produces gastro-enteritis in sheep.[5, 6, 7]

The Xosas use **Ranunculus capensis Thunb.** in the same way as they use Ranunculus pinnatus (see above).

The Zulus use the pounded leaf of **Ranunculus sp.,** Zulu *isiShoshokazana*, in water as a nasal douche to relieve the headache accompanying catarrh of the respiratory tract.

An infusion of the leaf or a decoction of the root of **Thalictrum minus L.,** Suto *lefokotsane*, *tloro-ya-ngwale*, is used by the Sutos for fever. The plant in the young state is eaten by them as a vegetable.

As very many members of this family have been proved to be irritant, and to contain an irritant, it is our opinion that all species should be regarded as potential irritant poisons, especially when fresh, until the contrary is proved.

REFERENCES

1. Marie G. Brandwijk and J. M. Watt: Med. J. of So. Afr., 1925, xx, 357.
2. C. F. Juritz: So. Afr. J. Sci., 1914, xi, 122.
3. C. F. Juritz: So. Afr. J. Sci., 1911, viii, 100.
4. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 193.
5. P. L. le Roux: Quoted by H. H. Curson, J. So. Afr. Vet. Med. Ass., 1927, i (1), 46.
6. A. O. D. Mogg: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 825.
7. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 800.
8. C. P. Thunberg: Travels in Europe, Africa, and Asia, 1770-1779, 2nd English Edition, 1795, i, 292.
9. Mérat et Delens: Quoted by L. J. Mercier et Fernand Mercier; Rev. de Pharm. et de Thérap. exp., 1927, i, 2.
10. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 724.

XXXVIII. MENISPERMACEAE

The Zulus drink a decoction of the powdered root of **Stephania meyeriana Harv.,** Zulu *umThombo*, made with **Momordica cordifolia Sond.,** for boils.

The root of **Antizoma angustifolia Miers.,** Maagwortel, Maag-bitterwortel, *bokwatso*, is used in intestinal troubles.

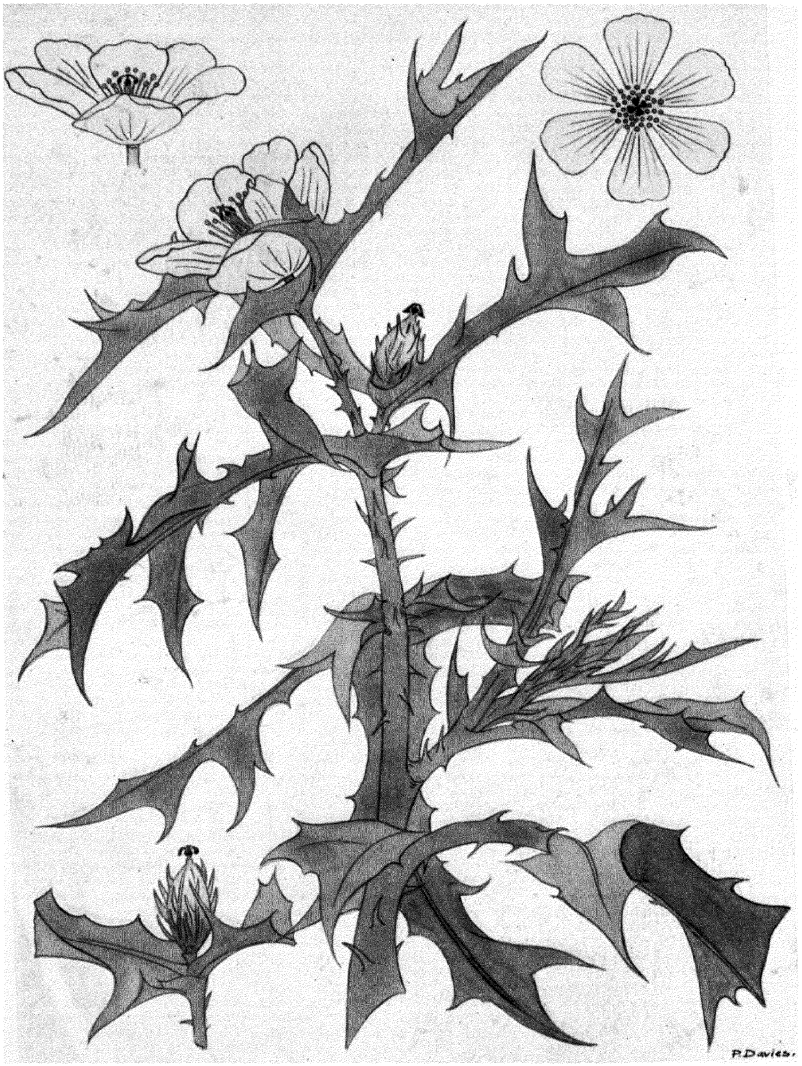
A dilute decoction of the root of **Cissampelos capensis Thunb.** (Antizoma capensis Thunb.), Dawidjies, is taken as a "blood purifier" in boils and syphilis. Hewat mentions this antisyphilitic use, and Smith states that the Xosas apply a paste of the leaf to the wounds, and drink a decoction of the root in snake-bite. The benefit in the latter use is thought to arise from a "general blood-purifying action." The Xosas also use the plant as an antisyphilitic remedy, and apply a leaf paste to syphilitic sores (Smith). According to Wicht, a weak tincture of the plant is used in dysenteries, and the preparation is purgative. Pappe states that the root was used by the early Cape settlers as an emetic and a purgative, and that the foliage is poisonous to cattle.

The Zulus apply a poultice of the leaf of **Cissampelos torulosa E. Mey.,** Dawidjies, Zulu *umThombo*, to "scrofulous swellings." From time to time they administer an enema of a decoction of the plant as an adjuvant (Bryant). The Zulus also chew the very bitter milky root for the relief of toothache (Bryant). The Xosas use the plant in syphilis in the same way as Cissampelos capensis Thunb. (Smith).

The Chuanas, Subias, and Kobas drink an infusion of the powdered root of **Cissampelos pareira L.** (Cissampelos mucronata A. Rich.), Chuana, Subia, and Koba *mokaekae*, Pedi *lepeta*, Filabusi *m'cessie*, for stomach-ache. The Filabusi natives drink a similar preparation for snake-bite. The root is apparently bitter and purgative. According to Smith, the Xosas use the plant in the same way as Cissampelos capensis Thunb. The Pedis use a decoction of the root as a wash for children who have pimples over their body. The root has been used as a substitute for and adulterant of *Pareira* (**Chondrodendron** or **Chondodendron tomentosum Ruiz. et Pav.**).[1, 2] It contains an alkaloid, *pelosine*[3] or *bebeerine*, $C_{18}H_{21}O_3N$, which has later been shown to be identical with bebeerine from other plants.[4, 5] According to Flückiger and Hanbury,[1] the root is very bitter, and without sweetness or astringency. The alkaloid is apparently a simple bitter in action[6] though it has been maintained that it has an action like quinine.

REFERENCES

1. F. A. Flückiger and D. Hanbury: Pharmacographia, 1879, 2nd Edition, 25, 29.
2. United States Dispensatory, 1926, 21st Edition, 818.
3. —. Wiggers: Annalen, 1840, xxxiii, 81, through ref. No. 6.
4. F. A. Flückiger: Pharm. J., 1869-70 (ii), xi, 192, through ref. No. 6.
5. —. Scholtz: Ber., 1896, xxix, 2054; Arch. Pharm., 1898, ccxxxvi, 530; 1899, ccxxxvii, 199, through ref. No. 6.
6. T. A. Henry: The Plant Alkaloids, 1924, 2nd Edition, 412, 415.



ARGEMONE MEXICANA L.

Facing page 55.]

XXXIX. MONIMIACEAE

The Zulus use the powdered bark of **Xymalos monospora Baill.**, Lemon wood, Wild lemon, Bog-a-bog, Borriehout, Lemoenhout, for colic.

XL. LAURACEAE

The bark of **Ocotea bullata E. Mey** (Oreodaphne bullata Nees. and Meissn.), Stinkwood, Cape laurel, Black stinkwood, Stinkhout, Swart stinkhout, Zulu *umNugane*, contains 3·15 per cent. of tannin.[1] The Zulus use the bark as a headache remedy. They either snuff the powdered bark or inhale the smoke from burning it. According to Bryant, they probably also use the powdered bark as a local application to the bladder in urinary disorders.

Cassytha ciliolata Nees., Nooienshaar, Nôienshaar, Vrouehaar, is used in decoction as a hair-restorer (Wicht). Pappe states that **Cassytha filiformis L.**, Vrouehaar, was formerly used as a wash in " scald head and for the destruction of vermin." He adds, " Some people pretend that it makes hair grow."

REFERENCE

1. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

XLI. PAPAVERACEAE

Argemone mexicana L., Bathurst burweed, Mexican poppy, Prickly poppy, Steekbossie, Suto *nthswantsane*, *sehlôhlô-se-seholo*, is an introduced plant which is used medicinally in other countries, but, so far as we can gather, is not used here. The plant contains *berberine*, $C_{20}H_{19}O_5N$ (formerly $C_{20}H_{17}O_4N$), and *protopine*, $C_{20}H_{19}O_5N$ (macleyine, fumarine), both alkaloids.[1] An alkaloid, *argemonine*, was previously isolated, but it is impure protopine.[1] Berberine is a bitter yellow substance with a variable effect on the circulation, and in overdose produces death by paralysis of the central nervous system.[2] In small doses its action is purely that of a bitter.[2] Protopine is narcotic.[2] The seed has been found to yield 36·5 per cent. of a light oil,[3] known as *katakar oil* in India.[4] The plant contains no morphine.[5]

REFERENCES

1. T. A. Henry: The Plant Alkaloids, 1924, 2nd Edition, 208, 302, 311.
2. T. Sollmann: A Manual of Pharmacology, 1926, 3rd Edition, 318, 320.
3. Bull. Imp. Inst., 1922, xx, 292.
4. S. L. Sarkar: Ind. Med. Gaz., 1926, lxi, 62, through Chem. Abs., 1926, xx, 2022.
5. R. F. Bacon: Philipp. J. Sci., 1906, i, 1007, through Chem. Abs., 1907, i, 1162.

XLII. CRUCIFERAE

Heliophila suavissima Burch., Suto *semamelwane*, is chewed by Suto witch-doctors before using the divining bones.

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The Sutos use the leaf of **Lepidium schinzii Thel.,** Suto *sebitsa*, Swazi *uMatholisa*, as a medicine. They sniff the crushed leaf to relieve headache, and drop the leaf juice on to the eyeballs for "sore eyes." The Swazis and Transvaal Zulus use the plant as an ingredient in a gonorrhoea decoction. According to Phillips, the Sutos use the plant as a vegetable.

An infusion of the tuber of **Lepidium capensis Thunb.,** Cape cress, Pepper cress, Sterkgras, Sterkkos, Suto *sebitsa*, Zulu *uMathoyisa*, is a Zulu cough remedy. The Sutos use the plant as a vegetable (Phillips). Marloth states that it is poisonous.[1]

A **Lepidium sp.,** Gifbossie, is credited with poisoning stock. The Swazis and Transvaal Zulus use a **Lepidium sp.,** Swazi *uMatholisa*, as another of the ingredients of the decoction mentioned under Lepidium schinzii Thel.

Brassica nigra (L.) Kock., Black mustard, occurs in South Africa as a wild plant. The seed contains an irritant oil (mustard oil).

Raphanus rhaphanistrum L., an introduced species known as Charlock (jointed), Ramenas, Ramnas, and Knopherik, is used by Europeans in the treatment of gravel. According to Wicht, the plant for this purpose is eaten or its juice drunk.

REFERENCE

1. R. Marloth: The Flora of South Africa: A Dictionary of the Common Names of Plants, 1917, 77.

XLIII. CAPPARIDACEAE

The Nyanjas of Nyasaland use an infusion of the leaf of **Cleome sp.,** Nyanja *chipyamaene*, as an eye-wash.

The seed of **Gynandropsis pentaphylla DC.** is used like mustard, and a pod is inserted into the external auditory meatus to extract wax, which it is said to do effectively.[1] The Shangaans apply the pounded leaf as a counter-irritant in rheumatism, neuralgia, headache, and a stiff neck, taking care to withdraw the application before it produces a blister.

The Wembas, near Mpika, drink an infusion of the bark of **Capparis tomentosa Lam.** (Capparis corymbifera E. M.), Wemba *kalanangwa*, Zulu *uMabusane*, *iQwanene*, *iQwaningi*, for the treatment of madness. They apply the chewed leaf to snake bites, and the powdered burnt roots are rubbed into skin incisions to cure headache. The Zulus drink a decoction of the decorticated root for coughs, and administer a cold infusion to animals for stomach troubles. They also apply a paste of the ashed roots to sore teats in cows. According to Bryant, they use the root in treating scrofula, chronic coughs, impotency, and barrenness.

Smith records that the Xosas use a decoction of the roots of **Capparis citrifolia Lam.,** Cape capers, Caper bush, Xosa *inTshilo*, for gall-sickness in stock.

Bryant mentions that the Zulus use the root of **Capparis gueinzii Sond.,** Zulu *uMabusana*, in the treatment of chronic coughs, especially if accompanied by haemoptysis.

The root of **Boscia albitrunca (Burch.) Gilg. and Benedict.** (Capparis

COTYLEDON ORBICULATA L.

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albitrunca Burch.), Shepherd's tree, Witgatboom, Witstam, Thlaping *motlope*, is used as a coffee substitute by the Thlapings and others. The drinking of this " coffee " by people unaccustomed to it is said to result in gastro-intestinal disturbance, but Steyn [4] administered large doses of the root-pulp to a rabbit without any effect. The root is sometimes edible, and the foliage is eaten by stock. The plant is also used as a medicine in Moçambique (de Almeida [3]), and the Thlapings make an eye lotion from the leaf (Schapera).

The seed of **Boscia foetida Schinz.,** Old woman's bush, Stinkbush, Stinkbos, Ou-meide-bos, Hottentot *p/kabou*, contains a *pungent principle.*[2] The fruit is edible, and the flower emits a most disagreeable odour. Laidler states that the Hottentots use a decoction of the plant as an emmenogogue, and for pains in the back.

De Almeida [3] states that the fruit of **Maerua angolensis DC.** is toxic.

REFERENCES

1. J. Burtt-Davy : 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 212.
2. R. Marloth : The Flora of South Africa, 1913, i, 234.
3. A. Gomes de Almeida : Bol. Agr. e Pecuário, i, 1930.
4. D. G. Steyn : 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 713.

XLIV. CRASSULACEAE

Cotyledon orbiculata L., Pig's Ear, Honde-oor, Kouterie, Konterie, Varkensore, Oorlams *plakkie*, Xosa and other Cape Bantus *iPhewula*, Suto *seredile*, Zulu *inTelezi*, is widely used in South Africa. Since the time of Pappe. the *fresh leaf juice* has been tried on occasion in the treatment of epilepsy. Recently we have been assured by an enlightened medical practitioner that it is beneficial, given in half-cupful doses twice or thrice daily. The fleshy part of the leaf is applied to hard corns by both Europeans and Xosas. Pappe says it softens the corn, which can then easily be peeled off. The Xosas use the warmed leaf juice as ear-drops in earache and as toothache-drops for toothache. The Zulus and Swazis use a decoction as an enema in syphilis. Phillips states that the Sutos use the plant as a medicine in many diseases. The plant is poisonous ; these effects were first noted in 1909.[1] when the chopped-up leaves were fed to fowls in mistake for aloe, and caused widespread poisoning and several deaths, the symptoms being those of a narcotic poisoning. This action in fowls has since been confirmed,[2] and in addition, goats were found to be susceptible to the poisonous effects.

Kamerman [3] has isolated from the *fresh* leaves *cotyledontoxin*, an amorphous, slightly bitter, colourless compound, which he thinks belongs to the picrotoxin group. It is soluble in water, alcohol, and ether. This principle depresses sensation on local application, and apparently depresses the central nervous system, resulting in complete paralysis. It is noteworthy that the toxic principle cannot be recovered from the leaf juice, and the use of the latter as a remedy for epilepsy is probably therefore without effect. The pure toxin is capable of producing the symptoms of *krimpsiekte* in goats. Both

Kamerman [3] and Steyn [4] find that the toxicity of the plant varies with the locality of collection. Steyn records that plants grown on the Magaliesberg are three times as toxic as those growing at Onderstepoort. It was thought that the reason for this was difference of soil (heavy clay soil and sandy soil). A specimen from the Magaliesberg was therefore cut in half, one of which was planted in sandy soil and the other in heavy clay soil. Five and a half weeks later they were tested. The sandy-soil plant had lost half of its toxicity, the clay-soil had doubled its toxicity. The sandy-soil plant, however, had a greater water-content. Steyn finds that young, medium-sized, and old leaves are equally toxic, that the flower is twice as toxic as the leaf, and that slicing and desiccation in the sun has no effect on the toxicity.

Cotyledon orbiculata L. has been suspected of causing krimpsiekte under natural conditions, but Henning [5] is of the opinion that the disease is produced in nature by Cotyledon wallichii Harv. only. (See Cotyledon ventricosa Burm.) The action of the plant on the central nervous system is apparently paralytic.

The leaf of a new species of Cotyledon, which has been included under the name Cotyledon orbiculata L., is chewed for the treatment of bilharziasis.

Pappe mentions that **Cotyledon arborescens Willd.** (Crassula arborescens Willd.) was used in the same way as Cotyledon orbiculata L. for epilepsy and corns.

Cotyledon mamillaris L. f. has apparently been used in the treatment of epilepsy,[6] but we have no record of its efficacy and composition.

Walsh [7] states that **Cotyledon eckloniana Harv.** is a cause of krimpsiekte. Curson [8] agrees that the plant is toxic and can produce the disease.

Cotyledon wallichii Harv., Bandjiebos, Kandelaar, Nentabos, Pandelaar, Krimpsiekte-bos, is also toxic, causing krimpsiekte in small stock.[3, 5, 9] This is characterised by paralysis of the central nervous system, which is caused by the toxin, *cotyledontoxin*, isolated by Kamerman.[3] The Nama Hottentots use the decorticated and pounded stem as a poultice for abscesses (Laidler).

Cotyledon paniculata L. f. (Thunb. ?), Botterboom, is also toxic.[3, 10] containing *cotyledontoxin*.[3] Phillips [10] states that the plant produces non-fatal laminitis in kids. **Cotyledon decussata Sims.** has been found to contain *cotyledontoxin*, and is therefore toxic.[3]

The disease of small stock, known as *nenta*, or *krimpsiekte*, was first brought to the attention of the public in the Report of the Cattle Diseases Commission of 1877,[13] under the name of *rita*. The leguminous plant **Lessertia annularis** was first suspected as the cause, but later, experimental feeding of this plant showed it to be innocuous.[14] It was not until 1890 that the true cause of the disease was discovered, when Mr Weyer, a farmer of Darlington, reported [14] that he suspected that **Cotyledon ventricosa Burm.** was the cause. Veterinary Surgeon Soga [11] was immediately sent to conduct experiments in the district, and was successful in producing the disease experimentally by feeding the plant to goats. As some surprise was evinced at these results, confirmatory experiments were carried out during the later nineties by Veterinary Surgeons Tomlinson,[14] Borthwick,[14] and Dixon.[15] The accompanying photographs of

FIG. 1.

FIG. 2.

EXPERIMENTAL POISONING BY FEEDING COTYLEDON VENTRICOSA BURM. TO GOATS. Experiments conducted and photographs taken by Veterinary Surgeon Borthwick. He states that the appearances illustrated in the photographs are the same as those seen in cases of poisoning occurring under field conditions. These figures are from an old Journal, and have not reproduced quite as well as we would have liked. They are, however, the only ones available and are of considerable historical interest.

FIG. 1.—Goat in the Acute Stage of Nenta or Cotyledon Poisoning.

FIG. 2.—Position taken up by Goats when lying down in the Last Stages of the Disease and in which they are usually found Dead.

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goats suffering from the disease were taken by Borthwick in 1898. They are thus of considerable historical interest. These results have again been confirmed by Steyn,[4] Henning,[5] and Walsh.[7] Henning [5] expresses the opinion that the disease is produced under natural conditions only by **Cotyledon wallichii Harv.**, but it appears clear from the mass of work quoted above that, at least in certain parts of the Cape Province, **Cotyledon ventricosa Burm.** is the cause. Soga [11] describes the symptoms as follows:—early in the season only a few goats are affected, and these always hurry to reach the kraal first, but immediately on arrival lie down. More severely affected goats travel along with great difficulty, with a staggering gait, tucking in of the hind legs, severe shivering, dangling of the head, and, in many cases, prominent arching of the back. In other cases the back tends rather to sag, and the respiration is always quickened. When lying down the animal twists the neck in a characteristic manner with the head resting on the flank. In very severe cases the extremities are cold, there is swelling of the abdomen, frequency of micturition, constant grinding of the teeth, and involuntary regurgitation of food, so that it dribbles from the mouth and nostrils. There is often an inability to open the mouth to the ordinary extent, and some difficulty in swallowing. In the last stages, there are spasmodic heaving of the abdominal muscles and spasms of the diaphragm, while salivation is prominent, and the tongue and palate take on a bluish tint.

In the early stages, an affected goat at rest scarcely shows any indication of being ill unless it is driven, when it walks with the back slightly arched and the tail fully extended and quivering. It is interesting to note that the early observers of the disease noted that the whole plant must be fed in order to produce symptoms. In this connection, Kamerman's [3] remark that the juice of various **spp. Cotyledon** is devoid of *cotyledontoxin* is of importance.

Phillips [10] states that **Cotyledon reticulata Thunb.** Ou-koei, has caused non-fatal partial paralysis in fowls, but Kamerman [3] finds that it is non-toxic.

Cotyledon caryophyllacea Burm., Nenta bossie, has been suspected of causing *krimpsiekte*,[12] and **Cotyledon papillaris L. f.** has proved negative in a toxicity test.[4]

Cotyledon cacalioides L. f. is toxic to goats, producing the symptoms of *krimpsiekte*,[8] but there appears to be no evidence that the plant produces the disease in nature.

The Sutos use **Cotyledon flanagani Schönl.**, Suto *seredile*, in difficult confinements, and they make a remedy for barren women from the roots of this plant and **Commelina africana L.** (Phillips).

A milk decoction of the leaf of **Cotyledon sp.**, Suto *seredile*, is drunk by the Sutos for gastro-intestinal and renal troubles.

Phillips records that a decoction of **Kalanchoe thyrsiflora Harv.**, Suto *seredile*, is used as an anthelmintic enema by the Sutos, but states that it must be used with care, as it may prove harmful. A decoction of the root is drunk by pregnant Suto women who do not feel well. For colds, the Sutos either chew the fresh root of **Kalanchoe paniculata Harv.**, Suto *sehlakwahlakwane*, or snuff the dried powdered root (Beyer).

The leaf juice of **Crassula portulacea Lam.**, Beestebul, Plakkies, Kerky,

Hottentot *karckay, t'karkey, t'karkai*, Suto *thlakeni*, is used as an astringent, and the nectar as a purgative. Pappe mentions it as a diarrhoea remedy.

The Zulus use the leaf of **Crassula vaginata E. and Z.**, Zulu *uDumbukaye*, after soaking it in hot water, to foment bruises. They eat the ground-up root in their *amasi* in times of scarcity of meal.

Crassula rubicunda E. Mey., Zulu and Swazi *inTelezi*, Suto *kxatô, fekô*, Zulu *isiKhelekhehlane*, is used as a cancer cure, but we have no details. The Zulus and Swazis apply the juice of the plant, mixed with water, as a nasal douche in influenza and other fevers. Bryant records that the Zulus use a decoction of the plant as an enema in dysenteries and diarrhoeas, particularly in cases where blood is being voided.

The Zulus also use an infusion of all parts of **Crassula,** *near* **Crassula recurva N. E. Br.**, as an emetic for heartburn and in hysteria.

Crassula lycopodoides L., Little fever bush, Ketting, Skilpadkos, Slangbossie, Veterbossie, Kleinkoorsbos, is used as a dysentery remedy (Wicht).

Thunberg records that **Crassula tetragona L.** has "somewhat of an astringent nature," and that the early colonists used it as a diarrhoea remedy. Pappe states that the leaves, boiled in milk, were used as a tonic in diarrhoea.

A decoction of **Crassula subulata Harv.** (Tillaea subulata Benth. et Hook (?)) is used by natives in the Transvaal as a refreshing addition to the bath.

The Sutos use a lotion made from the roots of **Crassula galpini Schönl.**, Suto *mohata-metsi, sethsosa*, to wash the body in fatigue and in fever accompanied by pain (Phillips). They also use a decoction of **Crassula natalensis Schönl.**, Suto *bohôbê-ba-setsomi*, as an internal remedy in sore throat and as a lotion for sore eyes (Phillips). The Sutos, likewise, use a decoction, made by prolonged boiling, of **Crassula turrita Thunb.**, Suto *seredilenyana, selatsi*, for chest complaints.

Crassula transvaalensis O. K. (Crassula subulata Hook), Suto *moriti-wa-letlapa*, is smoked by the Sutos to relieve headache (Phillips).

According to Pappe, the early Cape settlers used a decoction of **Crassula ericoides Haw.** (Tetraphyle furcata E. and Z.) for diarrhoeas and dysenteries. He states that the plant is bitter and astringent, and was used with success amongst the troops in some of the Kaffir wars.

According to Ecklon,[16] the root of **Crassula arborescens Mill.**, Hottentot *t'karkai*, is astringent, but was eaten none the less by the Hottentots.

REFERENCES

1. J. Burtt-Davy: Trans. Agr. J., July 1909, vii, 653.
2. D. Kehoe: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 387.
3. P. Kamerman: So. Afr. J. Sci., 1926, xxiii, 179, 185.
4. D. G. Steyn: 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 791.
5. M. W. Henning: 11th and 12th Rpts. Dir. Vet. Educ. and Res., Union of South Africa, 1926, i, 331.
6. News and Comments, Med. J. So. Afr., 1921, xvi, 211.
7. L. H. Walsh: South African Poisonous Plants, 1909, 18, 21.
8. H. H. Curson: 13th and 14th Rpts. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 203; J. So. Afr. Vet. Med. Assoc., 1927, i, 45.
9. C. F. Juritz: Chem. News, April 1925.
10. E. P. Phillips: Bot. Survey So. Afr., Memoir IX, 1926, 13.

11. J. F. Soga : Agr. J., Cape of Good Hope, 1891, iii, 140.
12. R. Marloth : The Chemistry of South African Plants and Plant Products, 1913, 9.
13. Cattle Diseases Commission, Cape of Good Hope, 1877, 17, through ref. No. 14.
14. D. Hutcheon : Agr. J., Cape of Good Hope, 1899, xiv, 862.
15. R. W. Dixon : (1) Rpt. Colonial Vet. Surg. for 1895, Cape of Good Hope, G. 41—1896. 124 ; (2) Rpt. Colonial Vet. Surg. for 1899, Cape of Good Hope, G. 35—1900, 37.
16. C. F. Ecklon : So. Afr. Qtly. J., 1830, iv, 379.

XLV. SAXIFRAGACEAE

In the Filabusi district of Southern Rhodesia, natives use **Vahlia capensis Thunb.,** Suto *phakisanyane*, with **Wormskioldia longipedunculata Mast.** (both known under the names *masopi*, *notie*, and *cocuto*), as a remedy for sore eyes.

Thunberg records that though **Montinia acris L. f.** is very acrid, it is eaten by sheep.

XLVI. PITTOSPORACEAE

Pittosporum viridiflorum Sims., Kasuur, Xosa *umKhwenkwe*, Zulu *umFasamvu*, *uMasethole*, Suto *mosetlêla*, *mohatolle*, *mothsosa-nku*, *phukhu-e-nyenyane*, is widely used as a medicine among the Zulus and Xosas. A decoction or infusion of the bark is used by both as an emetic, and sometimes as an enema for stomach troubles generally, but more especially in biliousness, or where the bile is thought to be the original cause of the illness. Sometimes it is used for feverishness and as an enema for pains in the back, the latter by the Zulus. The Zulus also use a decoction of the root as a " blood-purifying " drink, taken usually in the morning. This preparation is said to ease pain and to produce a condition of restfulness. The bark is said to produce a powerful action if taken in excess. Suto native doctors use the plant medicinally, but we have no details. Hewat states that natives use a decoction of the plant for respiratory diseases, and according to Smith, the Xosas use a decoction of the bark in " black gall-sickness." The bark, which is bitter, is sometimes added to Kaffir beer as a substitute for hops.[1]

REFERENCE

1. R. Marloth : The Flora of South Africa, 1925, ii (1), 33.

XLVII. CUNONIACEAE

The bark of **Platylophus trifoliatus Don.,** White alder, Wit-els, contains 6·08 per cent. of tannin, and the bark of **Cunonia capensis L.,** Red alder, Rooi-els, 8·40 per cent.[1]

REFERENCE

1. C. F. Juritz : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

XLVIII. MYROTHAMNACEAE

An infusion of the leaves of **Myrothamnus flabellifolia Welw.**, Resurrection plant, Pedi *phatse-ya-thšwene*, is drunk for colds, and used as a lotion for abrasions. A strong decoction is taken for backache, kidney troubles, haemorrhoids, and for excessive menstrual pain. The Pedis burn the plant and inhale the smoke to relieve pains in the chest. Marloth states that the plant contains a balsam.[1]

REFERENCE

1. R. Marloth : The Flora of South Africa, 1925, ii (1), 35.

XLIX. ROSACEAE

The fruit of **Pyracantha coccinea Roem.** has been suspected of producing human poisoning, but in the only case brought to our notice the patient was suffering, and died, from tubercular meningitis. The fruit is often eaten by children, and is thought to produce purgation.

In the Transvaal, a mucilaginous preparation, made by boiling the crushed seeds of **Pyrus cydonia L.** (**Cydonia vulgaris Pers.**), Quince, Kweepeer, is used as a dressing for bed-sores (Pijper). The seeds contain a large amount of mucilage,[1] and yield 20·5 per cent. of fixed oil to ether.[3] For the constants of this oil, see reference No. 3.

The Zulus drink a decoction of the root of **Rubus pinnatus Willd.**, South African blackberry, Bramble, Braamwortels, Braambos, Zulu *iJingijolo*, for chest troubles. Pappe states that the roots are astringent, and were formerly used as a decoction for chronic diarrhoea, views which are also expressed by Wicht.

The Transvaal Zulus and Swazis take the powdered root of **Rubus ludwigii E. and Z.**, Wild bramble, Zulu *iTshalo*, Swazi *iMencemence*, Suto *monokotswai-wa-basadi*, in water to ease stomach-ache. The Sutos administer a decoction of this root or of the root of **Rubus rigidus Sm.**, Suto *monokotswai-wa-banna*, Zulu *iJingijolo*, when there is acute pain during an illness (Phillips). The Zulus drink a decoction of the latter root in dysenteries and diarrhoeas (Bryant).

The Sutos inhale the smoke from burning **Alchemilla woodii O. Kuntze,** Suto *molala-phoka*, *morothetsa*, to relieve headache (Phillips).

The Zulus use the finely powdered leaves of **Agrimonia eupatoria L.**, Zulu *uMakhuthula*, Suto *mosinwana*, as a tape-worm remedy in man and animals. The Hottentots use an infusion as a stomachic (Smith), and the Xosas (Smith, Hewat) and Sutos (Phillips) use the plant as a vermifuge. Smith says the plant has an aromatic odour and a bitter taste. The plant has been a widely used folk-medicine in Europe and America, and contains a *volatile oil*, and has some astringency.[1] Kroeber [2] gives some constants of the oil. (**Agrimonia eupatoria L.**, *var.* **capensis Harv.**, is known as Agrimony, Agrimonie, Akkermonie, and Xosa *i Nyinga*).

The Zulus apply a paste of the ground-up leaves of **Leucosidea sericea E. and Z.,** Oubos, Ouhout, Dwadwa, Zulu *umTshitshi*, Suto *mosinô*, to the eyeball, and inside and outside the lids, in ophthalmia. The Sutos use the plant as a vermifuge (Phillips).

A strong infusion of **Cliffortia odorata L. f.,** Wilde-wingerd, is drunk for colds and in miscarriages, and is used in cattle diseases. Sometimes the steam from a hot infusion is inhaled for colds. Wicht says the infusion is used in haemorrhoids.

Pappe records that in the Uitenhage district the early Boer settlers used **Cliffortia ilicifolia L.,** Doringtee, as an emollient and expectorant in coughs.

According to Pijper, an infusion of the leaf of the peach, **Prunus persica Siet.** (Persica vulgaris L., Prunus persica (L.) Sieb. and Zucc.), is administered in the Transvaal to girls in whom the inception of menstruation is delayed. Peach kernel *oil* is applied to impetigo. The kernel, flower, leaf, and bark have the peculiar odour and taste of bitter almonds, and yield hydrocyanic acid. A *volatile oil* can be obtained by distillation from the leaf, while the kernel yields, by expression, a *fixed oil*, which has been largely used as an adulterant of almond oil. The leaf is said to be purgative, and has been used elsewhere in whooping cough, instability of the bladder, etc. The flower is stated to be purgative and anthelmintic, and fatal cases of poisoning are said to have occurred in children from its use.[1]

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1188, 1277, 1420.
2. L. Kroeber: Pharm. Zentralh., 1927, 23, 36, 68, 163, 374, 452, 518, 605, through Chem. Abs., 1927, xxi, 4018.
3. E. Bureš and J. Šátek: Časopis Českoslov. Lékárnictva, 1928, viii, 187, through Chem. Abs., 1929, xxiii, 3364.

L. LEGUMINOSAE

The bark of **Albizzia anthelmintica Brongn.,** Monsenna, Musenna, Musana, Besana, Mesenna, Ovamba *omuama*, is used in South-West Africa as an anthelmintic, particularly against tape-worms (dose 60 grm. or more). It has for long been used in Abyssinia for a similar purpose. According to the United States Dispensatory,[1] Caventou and Legendre found no alkaloid, but isolated from the plant a " peculiar acid, acrid, resinous substance," which is considered to be the same as the *musennin* of Theil. The bark contains *saponins*; [2, 3, 4, 5] Peyer and Liebisch [4] found 8·2 per cent. total of saponins (source of bark not given), while Watt and Breyer-Brandwijk [5] isolated from South-West African bark a total of 0·6622 per cent., being 0·272 per cent. by lead acetate, 0·0746 per cent. by lead subacetate, and 0·3156 per cent. by barium hydroxide. An infusion and a decoction of the bark is toxic to earth-worms,[6] and the bark has therefore probably a moderate efficiency as an anthelmintic. The saponins isolated by Watt and Breyer-Brandwijk show a low haemolytic power, are non-toxic on intravenous injection into rabbits, and are non-toxic to earth-worms.[5]

The saponins, therefore, are not the anthelmintic principles of the bark. Pammel states that the tree is used as a fish poison. A dry, alcoholic extract of the bark in doses up to 2 grm. per kilo is non-toxic by the stomach to rabbits and cats.[5] In cats it produces symptoms of slight gastro-intestinal irritation.

In Northern Rhodesia the Lambas and other tribes make medicinal use of the bark and sap of **Albizzia antunesiana Harms.,** Lamba *umSase.* An infusion of the bark is used as a lotion for cuts to prevent suppuration, and the sap from the wood is dropped into the eyes for inflammation.

According to Bryant, **Albizzia gummifera (Gmel.) C.A. Sm.** (Albizzia fastigiata E. Mey.) Flatcrown, Zulu *uSolo, umHlandlothi,* Tonga *gowana,* Tsua *mbezwa,* Chopi *moesu, ohesu,* Chuabo *maranga,* is poisonous and is used medicinally by the Zulus. They apply a cold or hot infusion of the bark and root to scabies and other skin diseases, and use a cold infusion of the root in the local treatment of inflammatory conditions of the eyeball. In Moçambique the natives use the bark for bronchitis (de Almeida). *Sassa gum* is prepared from the tree.[1]

Albizzia lophantha Benth., Pedi *lešitsane,* is used by the Pedis as a remedy for women. A decoction is given after parturition to ease pain and abdominal discomfort. The seed, when broken up and moistened with water, develops an extremely foul and nauseating odour.

The root of **Albizzia umbalusiana Sim.,** Ronga and Swazi *nala-nyala, nala,* is taken by the Swazis and Rongas for stomach troubles (de Almeida).

The Zulus use an infusion of the bark of **Acacia caffra Willd.,** Cat thorn, Katdoring, Kaffer wag-'n-beetjie, Zulu *umTholo,* as an emetic for "blood cleansing." A milk enema of the leaf is administered for infantile abdominal disorders, and sometimes the child is made to chew and swallow the leaf. A Zulu disliked by his fellows, in order to overcome or neutralise this, uses a decoction of the bark of **Acacia gerrardi Benth.,** Rooibas, Rooidoring, Zulu *umKhamanzi,* as an emetic and enema. Sometimes the vapour from the hot decoction is inhaled in addition. A decoction of the bark of **Acacia benthami Rochbr.,** Gum acacia, Ruikpeul, Doringboom, Zulu *umNqwe,* Tonga *sehoho,* is taken by the Zulus for dry coughs. It is said to be effective in loosening the cough. The pods are used in tanning, and a decoction of them as ink.

Acacia karroo Hayne (Acacia horrida Willd.), Karroo thorn, White thorn, Sweet thorn, Gum arabic tree, Mimosa, Thorntree, Doringboom, Karodoring, Witdoring, Soetdoring, Suurdoring, Suto *leoka,* Zulu *umuNga,* Thlaping *mooka,* has been used medicinally for years. A decoction of the bark is a Zulu emetic, and Pappe states that it is astringent, and was used by the early colonists in diarrhoeas and dysenteries. The Sutos administer the crushed roots with the food of infants for colic. The bark is also used in tanning. The leaves and legumes are eaten by stock. There exudes from the tree a gum, known as *Cape gum,* which resembles gum acacia, but consists mainly of *arabo-galacton.*[7] It is very brittle, and yields a mucilage which is less adhesive than mucilago acaciae,[1] but which can be used for pharmaceutical purposes.[8] Amongst the Thlapings the gum, which is sweet, is eaten by children. In the Transvaal a plaster made from capsicum fruit, cape gum, and strong vinegar, is applied in acute osteomyelitis (Pijper), and a mucilage of Cape gum to the mouth in

thrush and sprue. A mould growing on Acacia karroo is used to draw out broken needles in the hand, and to draw abscesses.

An infusion of the bark of **Acacia lasiopetala Oliv.,** Zulu and Tonga *um Khamba,* is used by the Zulus as an enema for pains in the back and by Zulu women as a lotion for chafing in the genital region. **Acacia spirocarpa Hochst.,** Umbrella thorn, Baster-kameeldoring, Busana, Tonga *umsasane,* is used in tanning.

The large woody pods of **Acacia giraffae Willd.,** Camelthorn, Kameeldoring, Kameelboom, Thlaping *mokala,* Bushman *cwanap,* are sweetish and astringent.[9] This species has been thought to yield a *gum* superior to that of Acacia karroo. The leaves and legumes are eaten by stock.

The bark of **Acacia pycnantha Benth.,** Golden wattle, yields 18·25 to 26·04 per cent. of tannin,[10, 60] that of **Acacia saligna Wendl.,** Golden willow, Port Jackson willow, 19·12 to 22·92 per cent.,[10, 60] that of **Acacia decurrens Willd.,** Wattle bark, Black wattle, Babul bark, Neb-neb, Acacia bark, Acaciae cortex, 24 to 42 per cent.,[1] and that of **Acacia mollissima Willd.** (Acacia decurrens, *var.* mollis Willd.), Black wattle, 40·1 per cent.[11] They are all used as a source of tanning materials. A detailed and careful investigation of the tannin content of the bark of Acacia mollissima Willd. under varying conditions in Natal has been published by Williams.[64] **Acacia pycnantha Benth.** yields a gum known as *wattle gum* or *Australian gum,*[1] and **Acacia farnesiana Willd.,** ex Nyasaland, a soluble gum of the arabic type.[12] The fruit of the latter contains 11 to 16 per cent. of *tannin,*[3] and from the flowers is prepared a variety of *oil of cassia* used in perfumery.[13]

The pod of **Acacia arabica Willd.** yields 26·69 per cent. of tannin, and of **Acacia arabica Willd.,** *var.* **kraussiana Bth.,** Tonga *khawa,* 19·6 per cent.[14] The bark also contains *tannin,* and the tree exudes a *gum.* The Tongas use the root as a tuberculosis remedy (de Almeida).

The Bushmen use the sap of **Acacia detinens Burch.,** Hookthorn, Haakdoring, Hakiesdoring, Swarthaak, Chuana and Thlaping *mongana,* in mixing the powdered grub of **Diamphidia simplex** into a form suitable for application to arrows.[15] The legumes and leaves are edible.

The bark of **Acacia pallens Rolfe.,** Knobthorn, Wait-a-bit, Knoppiesdoring, Tonga *umakya,* contains *tannin* (Stevenson-Hamilton). Pammel mentions that the plant is mechanically injurious to stock. The Tongas use the wood as a timber, and the pods are eaten by wild animals. A decoction of the bark of **Acacia retinens Sim.,** Tonga *umshangwe,* is a Tonga emetic. This tribe makes a dye from a decoction of the pods. The bean is eaten by game (Stevenson-Hamilton). **Acacia xanthophloea Benth.,** Fever tree, is said to convey malaria. This idea probably arises because the tree grows in swampy surroundings. The bark of **Acacia cyclopis A. Gunn** has yielded 6·5 per cent. of *tannin.*[60]

The Hottentots use the exudate from an **Acacia sp.,** Hottentot *heyra,* as a food, and make a salve, by boiling it with fat, for application to whitlows and boils. Bantus use a hot infusion of an **Acacia sp.,** Mimosa, Bitter olive tree, isiDuli, as a gargle in Quinsy (Hewat).

Dichrostachys nutans Benth., Tonga *nthenga,* is a Tonga toothache remedy (de Almeida).

The root and bark of **Elephantorrhiza burchellii Benth.,*** Elandsboontjie, Elandswortel, Looiersbossie, Suto *mositsane*, Xosa and Zulu *inTolwane*, are tanning materials. The Zulus and Xosas use the root as a diarrhoea and dysentery remedy, and the former in any febrile condition (Bryant). The roasted seed is a Suto coffee substitute (Phillips). The root contains 5·8 to 22·3 per cent. of *tannin*.[7, 16, 17] The seed is toxic to sheep, guinea-pigs, and rabbits, causing a gastro-enteritis.[18] Steyn [19] investigated the toxicity of the bean, because it was said to have been the cause of death in a native. He finds that it is strongly irritant. Watery extract, equivalent to 0·75 grm. of bean, produces extensive subcutaneous necrosis at the point of injection, and gastro-enteritis and oedema of the lungs in guinea-pigs when injected subcutaneously. The minimum lethal dose for rabbits per os is 5 to 7·5 grm. per kilo. They show apathy, loss of appetite, and profuse foetid diarrhoea, and die within twenty-four hours in a state of complete exhaustion. In sheep, 250 grm. per os caused death within twenty-four hours, with much the same symptoms. *Post-mortem* examination reveals acute gastro-enteritis, with numerous haemorrhages and marked degeneration of the liver. The toxic principle or principles are soluble in water, but insoluble in absolute alcohol and ether. The bean yields 10 per cent. by weight of a non-toxic, yellow, tasteless, fixed oil. From the watery extract a light brown resinous substance was obtained by evaporation, which proved highly toxic when injected subcutaneously into guinea-pigs.

The root of **Elephantorrhiza burkei Benth.,** Elandsboontjie, is used by farmers and natives in Bechuanaland for tanning. An infusion of the root of **Elephantorrhiza sp.** (?), Zulu *umDabu*, is a Zulu emetic for cases of serious heart disease. Sometimes they rub the powdered root into incisions on the chest for the same condition (Bryant).

The Fingos take a strong decoction of the root of **Entada natalensis Benth.,** Fingo *umLungu-mabele*, Zulu *iPhahle*, *iBobo*, *uBobo*, for sharp pains in the chest (non-tubercular). They also use the bark as a remedy for colds in horses. In the Marienthal district the natives use the plant as a syphilis remedy by eating the ground-up cooked root and smearing the powdered leaf over the affected parts. The Zulus use an infusion of the root as an emetic and feed the dried powdered root to goats to fatten them.

Entada scandens Benth., Sea-bean, Swordbean, Mackay bean, Garbee bean, Solvent stone, Seeboon, grows in South Africa. The seed is used for infants to bite during teething and also as a remedy in cerebral haemorrhage. The seed has, on occasion, been substituted for that of Physostigma venenosum Balf. in commerce.[1] Muir states that it is oily and edible. The roasted pod and seed are a coffee substitute, and are said to be purgative. The taste of the seed is bitter and acrid.[20] In Queensland it is thought to be very poisonous,[1] and both in South Africa [20] and in the Philippine Islands [21] the plant is used as a fish poison. Moss found *saponin* in the seed,[22] while Bacon [21] isolated *saponin* which gives a crystalline *sapogenin*, $C_{25}H_{42}O_3$ (part of plant not stated). In Europe the seed is used as a snuff, tinder, and matchboxes.[20] The bark is used in South Africa as a soap.[20]

The bark and seed of **Erythrophloeum lasianthum Corb.,** Zulu *um Khwangu*,

* Now Elephantorrhiza elephantina (Burch.) Skeels.

are used medicinally by the Zulus, and they have been known to use the bark for murder.[23] They also use the ground-up bark as a snuff for headaches and internally for abdominal complaints (it is said to be purgative), and for dogs to cure abortion. For these purposes the seed may be used instead of the bark, but is said to be much more powerful in its action. If the plant is fed to sheep, they develop in a few days a severe diarrhoea, which proves fatal after a week.[23] Kamerman[24] has isolated an *alkaloid*, 0·01 to 0·03 per cent. from the bark and 0·4 per cent. (calculated) from the seed. This alkaloid is apparently identical with *erythrophleine* from **Erythrophloeum guineense G. Don.** It is toxic, approximately 2 mg. per kilogramme killing a rabbit (route of administration not given) and producing a digitalis action on the heart. The alkaloid (not its salt) resinifies, and loses in toxicity when exposed to the atmosphere. Erythrophleine has been suggested as a devitalising agent for dental use, but is said to have no advantage over arsenic.[65]

The Ilas use the pounded bark and fruit of **Burkea africana Hook.,** Wild syringa, Wilde sering, Lamba *umu Nenene,* as a fish poison by simply throwing the material into streams.

An extract of the wood of **Copaifera mopane Kirk.,** Mopane, Rhodesian ironwood, Turpentine tree, Tonga *mopani*, is used in the Eastern Transvaal as a remedy for syphilis and as an application to inflamed eyes. Marloth [7] states that the root contains a *resin*, and that the seed yields about 20 per cent. of a heavy *balsam*. The leaf is scented.

The Marozis of Northern Rhodesia make people, suffering from temporary madness, inhale the steam from a hot decoction of the root of **Copaifera sp.** (= *Galpin* 7014 *in So. Afr. National Herbarium*). Kololo *muzauli*, Wiko *mushibi*, and sip at intervals beer or water in which the root has been infused.

The Zulus take a decoction of the bark of **Schotia,** *prob.* **Schotia brachypetala Sond.,** African walnut, Hottentot's bean-tree, Boerboon, Boerboontjie, Zulu *umGxamu, i Hluze, i Hlusi*, for heartburn and after excess of beer. The preparation is apparently emetic. According to Bryant, the plant is also a Zulu diarrhoea remedy. Medley Wood[25] states that the wood contains *tannin*, and that the wood dust is irritating to the eyes. Thunberg thought that **Schotia speciosa Jacq.** (Guajacum afrum L.) was toxic but it is not.[70] The seed is edible and the bark is used in tanning.

The bark, root, and leaf of **Berlinia,** *prob.* **Berlinia globiflora Hatch. and B. Davy.,** Lamba *umu Funda-nsofu*, are said to be highly toxic. In Northern Rhodesia the tree is used for trial by ordeal among the Lambas. The leaf produces retching, and an infusion of the bark or root causes a person to roll about as if in pain, to lose the power of speech, and to foam at the mouth. Phillips[70] states that it is non-toxic but is used medicinally.

The Ilas of Northern Rhodesia chew the leaf of **Bauhinia reticulata DC.,** Camel's hoof, Picture-frame tree, Kalgo (Orient), Lamba *umu Fumbe*, Wemba *muFumbe*, Chuabo and Swahili *masikesi*, for coughs and throat troubles, and use the bark in lung diseases. The Wembas (Northern Rhodesia) apply a poultice of powdered leaves, including those of this plant, to the eyeball in conjunctivitis. Dornan states that the natives of Rhodesia use the plant as one of their remedies for malaria, blackwater fever, blood-poisoning,

anthrax, and dysenteries. The bark is rich in *tannin*, and has been used as an astringent.[26]

The seed of **Bauhinia esculenta Burch.**, Gemsbuck beans, Gemsbokboontjies (Gensbokboontjies), Herero *ombanui*, *ozombanui*, is edible, and yields 41·6 per cent. of a golden-yellow limpid *fixed oil*, with a pleasant odour and taste.[27] It resembles cotton-seed oil, and is usable for domestic purposes.[27] The kernel is rich in protein, and the whole seed contains no toxic substances.[27] The tuber is astringent, but edible.[9]

The Lambas, Lenjes, Limas, and Swakas hold a warmed-up cold infusion of the root of **Cassia abbreviata Oliv.**, Heartwood, Lamba *aKafungu*, Tonga *lumanyama*, *in Konkoni*, in the mouth to relieve toothache. The Tongas use a decoction of the bark and the root for diarrhoea. The Xosas and Fingos place **Cassia mimosoides L.**, Xosa *umNgana*, Xosa and Fingo *uNobuthongwana*, under the pillow or under the sleeping mat to induce sleep. Smith reports that a milk decoction is used in dysentery, and that the entire plant is used as a remedy for eruptions on the face.

The Zulus use an infusion of the leaf of **Cassia,** *prob.* **Cassia occidentalis L.**, Zulu *umNqanda-nyoka*, *isiNyembane*, to relieve abdominal pain, and with another plant as a snake-bite remedy. The plant is also used as a charm to throw out evil spirits. Bryant states that the Zulus use the leaves and stalks against body vermin. The seed is purgative. Maurin [28] has isolated *oxymethylanthraquinone* from the plant—traces from the leaf, 0·25 per cent. from the fruit and 0·3 per cent. from the root. This being so, the fruit and root are also purgative. Moussu [29] finds that the plant contains a *toxalbumin*, but we have no knowledge of its toxicity relative to other similar substances

The Zulus use a milk infusion of the root of **Cassia obovata Collad.**, Wild senna, Elandspea, Swartstorm (Bechuanaland), Elandsertjie, Zulu *imPengu*, in influenza and, if the phlegm is obstructive, the powdered root mixed with fat. Burtt-Davy,[9] by feeding tests, showed that the root is mildly purgative, and Phillips [30] states that feeding tests have shown that the plant is toxic to stock. Steyn [19] drenched a sheep with 500 grm. of the dry plant in the flowering stage without any effect, and reports [66] that the plant is alleged to have caused heavy mortality in goats, but that tests on rabbits and a goat proved negative. The plant is one of the sources of " senna " leaves, used in medicine.[3] Maurin [28] finds the content of *oxymethylanthraquinone* to be

Wild . . .	Leaflets,	1·10	per cent.;	pods,	1·20	per cent.
Cultivated . .	,,	1·15	,,	,,	1·10	,,

Although we are not certain that **Cassia bearensis Miq.** occurs in South Africa, the fact that it is closely related to Cassia abbreviata Oliv.,[31] and is used in East Africa as a medicine,[31] has caused us to insert a short note on it. Dr O'Sullivan Beare discovered that in East Africa a decoction of the root is used for blackwater fever and schistosomiasis (bilharziasis). He found its effects to be beneficial in the former, and was instrumental in having a commercial fluid extract of the root placed on the market. This preparation has, from time to time, been prescribed by medical men for blackwater fever

with apparent benefit.[32] The East African natives, in addition, use the powdered bark as a dressing for ulcers. Turner [33] quotes Newell as stating that the fluid extract acts as a cardiac tonic, diuretic and diaphoretic.

Cassia fistula L., the well-known source of the purgative Cassia pods and pulp, is used by natives in Rhodesia as a remedy for malaria, blackwater fever, blood-poisoning, anthrax, and dysenteries (Dornan). Maurin [28] has isolated *oxymethylanthraquinone* from it—entire fruit 0·95 per cent., fruit pulp 1·05 per cent., and bark of the twigs 1·20 per cent.

Cassia petersiana Bolle, Tonga *nembenembe*, is a Tonga remedy for gonorrhoea, haematuria, and sterility (de Almeida).

In the Kafue district of Northern Rhodesia, natives use a cold infusion of the root of **Cassia sp.,** Lamba *muPingili*, as a lotion for the sores of syphilis and yaws. The infusion is also taken for dysenteries and diarrhoeas.

Caesalpinia crista L. (Caesalpinia bonducella Flem.) is an introduced species in South Africa. The seed is known under the common names of Grey nicker seed, Ash-coloured nickar, Molucca bean, Adder stone, Bonduc seed, and Knikkertjie. Muir [20] gives an interesting account of the folk-lore of the seeds, which are often cast up on our coasts. According to him, the seed has been used overseas as an amulet and in the treatment of diarrhoea, and an infusion for cerebral haemorrhage and for infantile convulsions in South Africa. In India and elsewhere it has been used as a tonic and in the treatment of malaria.[34, 35] Flückiger and Hanbury [34] have isolated a *bitter principle* from the seed, and state that it is the only active principle which they could isolate. The presence of this principle is confirmed by Heckel and Schlagdenhauffen,[36] who named it *bonducin*. This would appear to have bitter properties only, though Isnard [37] states that in doses of 0·1 to 0·2 grm., given as a pill, it is as effective as quinine in the treatment of malaria. This statement would seem to require confirmation. Bacon [21] has isolated *bonducin resin* from the plant and Bhaduri [38] an *alkaloid* from the seed. The wood of various species of Caesalpinia, including the species under consideration, is known as Pernambuco wood, and contains two dyes, *brasilin*, $C_{16}H_{14}O_5$, and *brasilien*, $C_{16}H_{12}O_5$ (Tschirch).

We are informed by the staff of the Government Chemical Laboratory, Johannesburg, that **Caesalpinia gilliesii Wall.,** Paradise tree, is poisonous.

The Chopis administer a cold infusion of the leaf of **Caesalpinia sp.,** Chopi *ngwenya*, for the treatment of fits and convulsions, especially at the time of the full moon.

The Lambas use the dried decorticated and powdered root of **Peltophorum africanum Sond.,** African blackwood, African black wattle, Rhodesian black wattle, Transvaal black wattle, Kiaathout, Huilbos, Lamba *mbalimbali*, *iPunganombe*, Suto *mosêhla*, *mosêthla*, Karanga *muzezi*, as a local application to wounds. An infusion of the bark is taken by the mouth in abdominal disorders. The Sutos chew the fresh bark for the relief of colic (Beyer), and the Karangas apply the steam from a hot decoction locally for sore eyes.

An arrow poison is prepared by the Kung bushmen of South-West Africa from a species of **Swartzia.** The pod (Kung *!anghwa*) is roasted, the rind scraped away, and a portion of the pulp (not seed) is ground up and added to a sticky

mass prepared from a non-toxic fibrous root, Kung *!ayi!ayi*. An extract of the fruit injected subcutaneously into a cat produced slight effects.

The Wembas of Northern Rhodesia chew the leaf of a **Swartzia sp.**, Wemba *ndale*, to relieve headache, and they apply it with that of **Diplorrhinchus mossambicensis Benth.** to the head for the same purpose. The Rozis, Wikos, Nyengos, Wenyis, Chibokwes, and Lovales use the root of a **Swartzia sp.**, Kololo *mushakashela*, Wiko *munyenya*, with the root of another tree, in making a decoction, or as an addition to beer, which is administered with homicidal intent.

Calpurnia lasiogyne E. Mey., Zulu *umKhipa-mpethu*, *isiPhane*, is applied by the Zulus to maggoty sores on cattle (Bryant). The Sutos use an infusion of **Calpurnia intrusa E. Mey.,** Suto *tloèlè*, *tlolè*, in the same way (Phillips). It is bitter.

In the Transvaal, natives use the dried inner parts of the bark of **Bolusanthus speciosus Harms.,** Elephant's wood, Wild wisteria, Rhodesian wisteria, Olifantsboom, Loodhout, Vanwykshout, *kgomobane*, *nabane*, *shabane*, Thonga *nhlohlo*, for abdominal disorders.

The leaves of **Cyclopia vogelii Harv., Cyclopia longifolia Vog., Cyclopia latifolia DC.,** and **Cyclopia genistoides Vent.,** all known as Bush tea, Honey tea, Boer tea, Bostee or Bossiestee, Heuningtee, are used as tea. **Cyclopia tenuifolia Lehm.,** Bush tea, Spelten tea, Vleitee, is similarly used. It contains a *volatile oil*, some *resinous matter*, but no thein.[60] The chief source of bush tea appears to be Cyclopia vogelii Harv. An infusion or a decoction of **Cyclopia genistoides Vent.** has been used as an expectorant in chronic catarrh and in pulmonary tuberculosis (Pappe). Bowie[61] states that this species is astringent, and that a decoction was used by the early colonists as a restorative. These plants contain no alkaloid, but *cyclopia red*, $C_{25}H_{22}O_{10}$, and *cyclopia fluorescin*, $C_{14}H_{18}O_{12}$.[7] Greenish[39] isolated a glucoside, *cyclopin*, $C_{25}H_{28}O_{13}$ H_2O, from Cyclopia vogelii Harv. and Cyclopia longifolia Vog. It should be noted that none of these teas contains either caffein or tannin, though Schmiedeberg[40] states that caffein is present. It has been maintained that bush tea has an action similar to coca leaves and kola nut, but there is no evidence to support this view.[2] Bush tea apparently does increase appetite.[2] Portions of the leaves of Grubbia rosmarinifolia have been found in bush tea.[2] **Leyssera gnaphalioides L.** (Compositae) is also a bush tea.[41]

Borbonia pinifolia Marl., Red tea, Koopmans-tee, Naaldtee, Rooibostee, Speldtee, **Borbonia parviflora Lamk.,** Skagaltee, and **Borbonia cordata L.,** Stekeltee, are also used as teas (Thunberg, Marloth). Borbonia pinifolia Marl. contains no alkaloid and no appreciable amount of tannin.[7] Borbonia parviflora Lamk. has been used in asthma and hydrothorax, and a decoction as a diuretic (Pappe). Bowie[62] records that **Borbonia undulata Thunb.** (Borbonia ciliata Willd.) is astringent, and was used by the natives as a tea.

Pappe records that the root of **Rafnia amplexicaulis Thunb.** (Vascoa amplexicaulis DC.), Soethoutbossie, tastes like liquorice, and that a decoction of it was taken as a demulcent in catarrh and phthisis. The same author states that a strong decoction of the leaf of **Rafnia perfoliata E. Mey.** is powerfully diuretic, and was used with success in the treatment of dropsies.

The Sutos use **Lotononis versicolor Benth.,** Suto *senamanama-se-seholo,* **Lotononis rehmannii Dümmer** (*ex descr.*), Suto *namele,* **Lotononis ornata Dümmer** (*ex descr.*), Suto *senamanama,* and **Lotononis calycina Benth.,** Suto *namele,* as a bronchitis remedy in children, and they make a sticky preparation from the root of **Lotononis lanceolata Benth.,** Suto *kxonathi,* which is taken orally or given as an enema in diarrhoea (Phillips). In the fresh state **Lotononis involucrata Benth.** contains a large amount of *hydrocyanic acid.* Steyn [19] fed 150 grm. of the half-dried plant to a sheep, which developed marked symptoms of poisoning by this acid, and diarrhoea. He estimates thus that the fresh plant must be highly toxic.

Lebeckia psiloloba Walp. is suspected of being poisonous,[42] and, according to the report of a farmer near Beaufort West, **Dichilus gracilis E. and Z.** is toxic to small stock.[9] Similar reports have come from the Nieuweveld Mountains, but no confirmation has been forthcoming.[9]

The Sutos burn **Melolobium microphyllum E. and Z.,** Suto *sehlabane, mofahla-twêba,* in the sick-room as a fumigatory (Phillips). **Melolobium candicans E. and Z.** has been suspected of producing poisoning in small stock, but nothing definite is on record.[50] A decoction of the root of **Melolobium sp.,** Suto *mofahla-twêba,* is administered by the Sutos as an enema in the treatment of diarrhoeas.

Crotalaria burkeana Benth., Rattle bush, Klappers, Styfsiektebos or Styfsiektebossie (Walsh states that it is sometimes called Dronkgras), has for long been thought to cause *styfsiekte* in stock.[43, 44] Theiler [45] described the disease in detail in 1911 and, later,[46] distinguished the varieties of the disease, and proved by direct experiment that **Crotalaria burkeana Benth.** is the cause of the *laminitic form of crotalism* in cattle. The condition is an acute inflammatory process in the horn-forming membrane of the hoofs, due apparently to some toxic process resulting from the ingestion of the plant. This causes the animal to walk stiffly on its heels, with the fore legs well forward, the hind legs underneath the abdomen, and the back arched. The animal suffers great pain, and as a result prefers to lie about, rises with great difficulty, and rapidly goes off condition through lack of food, from inability to wander far in search of it. In the acute stage, there are local signs of inflammation in the hoof. As a result of the manner of walking, the hoofs lose touch with the ground and begin to turn up, and the digits to separate and grow outwards. Later, the pain subsides, but the animal still walks stiffly, and is impeded in its locomotion by the abnormal growth of hoof. The disease is not usually directly fatal, but affected animals may die of starvation from inability to move around in search of sufficient food.[45]

Some attempt has been made to isolate toxic principles from the plant.[47] Traces of an alkaloid were found, but it proved to be inactive. It had been suggested that the plant contained cytisine, but the alkaloid isolated from the plant differed from it. The Imperial Institute inform us [48] that further experiments have been carried out, but all proved negative. No constituent has been isolated from the plant which could account for its action in producing styfsiekte. In Rhodesia the natives use the plant as one of their remedies for malaria, blackwater fever, blood-poisoning, anthrax, and dysenteries (Dornan).

Another species, **Crotalaria dura Wood and Evans,** Jagsiektebossie, is the cause of "*jagsiekte*" (crotalariosis equorum). Theiler [49] has proved this conclusively by direct observation on farms where the disease occurs, and from feeding experiments. The disease affects only equines, and develops after continuous feeding on the plant. The minimal amount required to produce the disease is 46 lbs., consumed over twenty-three days. The disease in Theiler's experiments lasted from six to twenty-nine days. Drying or autoclaving the plant produces no change in its effects.

The condition shows itself in the early stages by slight fever, which, however, does not constantly occur in all animals affected. This fever lasts up to fourteen days, is seen during the period over which the plant is being eaten, and is succeeded by a longer or shorter period of normality. Later, the true fever of the disease develops, accompanied by respiratory symptoms. The respiration becomes progressively quicker in rate and, later, dyspnoea develops. The animal has a dry cough which may be paroxysmal. There is at first a bronchitic type of affection of the lungs, passing later into a pneumonia, and frequently associated with emphysema. The animal shows anorexia and goes off condition steadily. The toxin has a special affinity for the epithelium of the alveoli, causing desquamation and necrosis. Regenerated epithelium meets with the same fate. Inflammation and formation of granulation tissue supervenes, with resultant pneumonic changes. Some horses show parenchymatous hepatitis and cirrhosis. Death is due to the respiratory effects.

In bovines, experimental feeding of the plant produces no lung effects, but the same liver changes are seen as in equines. The animal shows anorexia and diarrhoea, the dejecta being black and liquid. The animal rapidly becomes so weak that it is unable to stand. Emaciation is marked. *Post mortem*, in addition to parenchymatous hepatitis and cirrhosis, there is hyperaemia and swelling of the mucous membrane of the abomasum and the small and large intestine.[49] Five years' storage does not affect the toxicity of the plant.[66]

According to Pole Evans,[42] **Crotalaria globifera E. Mey.** also causes *jagsiekte* in equines, though Theiler [49] does not mention this species. Phillips [30] states that the plant produces fatal poisoning in horses.

Crotalaria pechueliana Schinz., a South-West African species, contains an alkaloid,[7] but we do not know whether the plant or the alkaloid is toxic.

Crotalaria allenii Verdoorn has been suspected of causing *styfsiekte* in cattle, but Steyn obtained negative results in tests on a sheep and a bovine.[66] **Crotalaria distans Bth.** also proved negative.[66]

A decoction of the leaves of **Baptisia perfoliata R. Br.,** *formerly* **Crotalaria perfoliata L.,** was, in former times, esteemed a powerful diuretic in dropsies (Thunberg). The Zulus drink an infusion of the root of a **Crotalaria sp.,** Zulu *uMayehlezana, uSi*, for chronic cough (Bryant). The remedy sometimes produces emesis.

Cytisus proliferus L. f., Tagasaste, is said to produce intoxication in horses if it is eaten while in pod.[50] Pammel states that it contains **cytisin,** which is an alkaloid having an action like that of *nicotine* (see Nicotiana tabacum : Solanaceae).

Melilotus parviflorus Desf., Melilot, Steenklawer, Stinkklawer, has been used as a discutient and emollient, and externally as a fomentation, poultice, or plaster for swellings, etc. Powdered, it was at one time an ingredient of snuff (Pappe).

The Sutos use **Indigofera tristoides N. E. Br.,** Suto *mmusa-pelo*, as a remedy for neuralgia and snake-bite. It is also administered to anyone who has sustained a great sorrow, as is **Indigofera tristis E. Mey.,** Suto *mmusa-pelo*.

The Xosas, according to Smith, chew the root of **Indigofera zeyheri Spr.,** Leeumhout, Suto *mmusa-pelo-o-monyenyane*, to relieve flatulence. He regards the plant as being toxic, and states that it is dangerous to use it in the way mentioned above. He mentions that a native doctor was punished for accidentally causing the death of a woman by administering the plant as a remedy, and records the fact that a decoction, given as an experiment, produced stupor and paralysis in animals.

Thunberg records that a decoction of the leaf of **Indigofera arborea** (*sic*) was said to be a good remedy for gravel and stone in the bladder. A decoction of **Indigofera sp.,** *prob.* **Indigofera patens E. and Z.,** Maagbossie, is used to relieve colic. Smith says the Xosas use a decoction of the root, which is bitter and diuretic, for indigestion and loss of appetite. He regards the plant as toxic, and states it must be used in very small quantity. The Xosas also use the powdered root as a local application to hollow teeth for the relief of toothache (Smith and Hewat).

Indigofera arrecta Hochst., Zulu *umPhekambedu*, is used by natives in the Transvaal in making a blue dye. The plant was introduced into Java from Natal, and is one of the sources of indigo.

Indigofera cryptantha Benth. has been suspected of causing lamsiekte, but feeding experiments produced only a certain amount of stiffness in sheep.[9] **Indigofera sp. (Indigofera hololeuca Benth.** (?)) has been suspected of being poisonous to cattle.[9] Likewise, **Indigofera sp. (Indigofera hilaris E. and Z.** (?)) has been suspected of poisoning cattle at certain seasons. It is said to produce delirium and paralysis.[9]

A decoction of **Indigofera spinescens E. Mey.,** Suto *lehlahla-barwana*, is used by the Sutos for colic, and they inhale the smoke from burning the root of **Indigofera fastigiata E. Mey.,** Suto *phêhlêlwane*, *lêta-la-phofu*, to relieve headache (Phillips).

The Zulus use a decoction of the root-bark of **Indigofera cylindrica DC.,** Zulu *umNukambiba*, as an anthelmintic in man and animal, especially for round-worms, and they take the powdered root of **Indigofera sp.,** Zulu *isiKubabende*, in porridge as an anti-diarrhoeic (Bryant).

Psoralea decumbens Ait., Ag-dae-genees-bos, is used for brewing a tea with aromatic properties (Wicht). A cold infusion of the root of **Psoralea pinnata L.,** Bloukeur, Pinwortel, Zulu *umHlonishwa*, is used by Zulu doctors as an emetic in a form of hysteria which affects them (Bryant). The infusion froths on stirring. In the Kalahari a **Psoralea sp.** is smoked as an asthma remedy. The Sutos smoke the root of **Psoralea polysticta Benth.,** Suto *mohlonethša*, for cold in the head (Phillips).

Tephrosia macropoda E. Mey., Zulu *iHlozana*, *iLozane*, *uQwengu*, has

been used for stupefying fish and as an insect powder. Meyer states that the fish can be eaten with impunity.[67] Bryant reports that the plant is very poisonous, but is used medicinally by the Zulus. They char the roots in a fire, which is thought to reduce the toxicity. The unburnt inner portions are powdered, and taken in typhoid fever. They also use the plant as an application to sores, as a vermin killer, and as an anthelmintic in cattle. Plugge [1] isolated a toxic principle from the root, but we have no knowledge of its constitution or action.

A warm infusion of the root of **Tephrosia capensis Pers.**, Zulu *isiKhwali*, Suto *pelo-di-marôba*, is a Zulu emetic for biliousness. The Sutos use the cooked root in palpitation of the heart (Phillips), and a decoction of the plant with **Commelina africana L.** as a remedy for " weak heart " and nervousness.

The Zulus make a cold infusion of the root of **Tephrosia lucida Sond.**, Zulu *iShoba-lehashi*, and **Dianthus crenatus Thunb.**, and wash the face with the froth that rises, in order to attract the opposite sex. The infusion is sometimes, in addition, drunk as an emetic to assist this good work. They also use a decoction of the root of **Tephrosia sp.**, *prob.* **Tephrosia grandiflora Pers.**, Zulu *iHlozana*, as a parasiticide. The preparation is said to have been used for the same purpose by transport riders in the early days of Natal. **Tephrosia diffusa (E. Mey.) Harv.**, Zulu *iHlozana*, *uQwengu*, according to Bryant, is very poisonous, and is used as a parasiticide by the Zulus.

The root of **Tephrosia lupinifolia DC.**, Kololo *namiyati*, is used by the Rozis and neighbouring tribes in Barotseland for procuring abortion and for committing suicide. For the former, a decoction is drunk, and is said to kill the foetus. Uterine pains are said to come on in about ten hours. The poison is thought to be most effective during the first three months of pregnancy. In committing suicide, the pounded roots are formed into a ball and inserted into the vagina. Death is said to follow with certainty in from twelve to twenty-four hours. Within an hour or two of the application, there develops considerable local and abdominal swelling.

The Sutos use a decoction of the root of **Tephrosia semiglabra Sond.**, Suto *pelo-di-marôba-ya-thaba*, and the root of **Haplocarpha scaposa Harv.** for chest colds. The Zulus take a warm infusion of the root of **Tephrosia kraussiana Meissn.**, Zulu *inSangwana*, *isiPhunga*, for troublesome night coughs (Bryant).

Tephrosia vogelii Hook., Fish bean (Northern Rhodesia), Lamba *uwuwa*, Nyanja *ombwe*, *matuta*, is used as a fish poison. The lambas throw the pounded root into the water, while the Nyanjas use the leaf in the same way. The plant is said to be very effective as a fish poison, and the fish can be eaten with impunity. The Nyanjas actually cultivate the plant for this purpose. The leaf is said to be an efficient parasiticide against fleas, lice, and ticks, and is commonly used in Rhodesia by Europeans for this purpose. The Nyanjas also use a weak infusion internally as an anthelmintic. It has been suggested that the plant might be used as a commercial " dip " for cattle.

Hanriot [51] isolated from the leaf *tephrosin*, $C_{31}H_{26}O_{10}$, *tephrosal*, $C_{10}H_{16}O$, and a *yellow uncharacterised substance*. Tephrosin is a crystalline neutral body melting at 187° C., and is the toxic principle. Tephrosal is a volatile aromatic

liquid which reduces Fehling's solution. Tephrosin is particularly toxic to fish, and very much less so when given orally to other animals. The minimum fatal concentration for fish is 1/50,000,000. Fish, when tephrosin is added to the water, first show great excitement, but soon become quiet, change colour, become paralysed, turn over, and die. Fresh-water fish are more susceptible to the poison than salt-water fish. Rabbits eat the leaves of the plant with impunity; a gram of tephrosin has been given in its food to a dog without effect, and frogs can be kept for days in a solution of a strength which would produce immediate death in fish. Crustaceans are much less susceptible than fish. Hanriot found the minimum lethal dose of tephrosin hypodermically to be 0·01 grm. per kilo in rabbits and dogs, death being produced by paralysis of the respiration.

The Imperial Institute[52] has confirmed Hanriot's chemical work and found that the leaf yields 0·15 per cent. of tephrosin, 0·06 per cent. of tephrosal, and 0·05 per cent. of the yellow substance. The seed yields 12 per cent. of a thick brown fixed oil and 0·3 per cent. of tephrosin. Watery and alcoholic extracts of the leaf or seed are highly toxic to **Aphis rumicis L.** (the bean aphis), the toxicity being of the same order as that of nicotine.[53]

Jindwe women, who are barren, eat porridge in which the root of a **Tephrosia sp.**, Jindwe *nyakonzongo*, has been cooked. It is thought to favour the occurrence of impregnation.

The bark and root of **Mundulea suberosa Benth.** contains a very toxic *glucoside*, $C_{33}H_{30}O_{10}$ (Pammell). We can find trace of no publication on its action.

Sutherlandia frutescens R. Br. is known by the following names: Cancer bush, Cancer wort, Kankerbossie, Kankerbos, Kalkoenbos, Kalkoenbelletjie, Gansies, Gansiebos, Gansbossie, Gansieskeur, Eendjies, Hoenderbel, Jantjie-Barend, Kipkippers, Kippiebos, Bitterblaar (at Calvinia, but usually applied to Brachylaena elliptica Less.), Bitterbos (Prieska), Keurtjies (Ceres), Sandolienhout (Bovlei), Wilde-keur (Prieska), Suto *mmusa-pelo-wa-noka*. The plant is widely used throughout South Africa as a popular remedy among both Europeans and Natives.

An infusion or a decoction of the leaf (usually weak) is taken internally in more or less unlimited amounts for stomach and intestinal complaints generally, internal cancers, uterine troubles, influenza, liver diseases, rheumatism, haemorrhoids, dropsy, and backache, and as a cough remedy and a tonic. The infusion is used as a douche in prolapse of the female genitalia. The powdered leaf mixed with syrup is said to be excellent for soothing a troublesome cough. A weak infusion taken before meals seems to act as a bitter tonic, improving appetite and digestion. Both preparations are said to cause sweating and to be slightly purgative, and, if the infusion is made too strong, to be emetic. Cattle browse the plant.

An infusion of the bark has been used in treating cancers, but clinical trials have proved negative (Wicht). According to Pappe, the powdered root and leaf have been used in treating eye diseases. The Sutos use an infusion of the plant for "dropsy of the heart." The Nama Hottentots at one time used a decoction of the plant for washing wounds, and internally in fevers,

and nowadays use it in consumption, chicken-pox, and other diseases. The plant has not yet been investigated chemically or pharmacologically.

An infusion of **Lessertia argentea Harv.,** Wilde-keur, is used as an eye lotion and, mixed with an infusion of Stockholm tar, to relieve colic and flatulence. It appears to act as a carminative. **Lessertia brachystachya DC.,** as a result of feeding experiments, is known to be toxic to stock.[30] **Lessertia annularis Benth.,** Krimpsiektebos, T'nenta, has in the past been suspected of causing the stock diseases krimpsiekte [54, 55] and styfsiekte.[50] It is now definitely known that krimpsiekte is caused by Cotyledon spp., and styfsiekte by Crotalaria spp. Lessertia annularis, none the less, appears to be toxic.[7, 42] According to Thunberg, the early Cape colonists applied **Lessertia tomentosa DC.** (Cotula vesicaria Thunb., Colutea vesicaria Thunb.) to the eye in the treatment of diseases of that organ.

It is not clear whether **Swainsona coronillaefolia Salisb.** (Swainsona galegifolia R. Br.), Darling pea, Indigo, occurs in South Africa. In Australia it is a stock poison, producing a peripheral neuritis and degeneration in the nerve endings, which results in considerable loss of muscular control and even paralysis. The action takes four to six weeks to develop. Recovery takes place, provided paralysis has not developed, otherwise the condition is hopeless. Animals, once addicted to the plant, seem to develop a habit to it, and refuse other food-stuffs, but eat the Swainsona greedily when it is offered. Addicted animals become unthrifty, and are a complete loss to the farmer. They usually wander listlessly, separated from their companions. Horses develop a species of delirium under the influence of the plant.[44]

The Tebeles use an infusion of **Zornia tetraphylla Mich.,** Tebele *uNqengendlela*, as a mild laxative, and in cases of retention of urine.

The Zulus use a decoction of the root of **Alysicarpus zeyheri Harv.,** Zulu *inTwalabombo*, Pedi *thlare-sa-pelo*, for the treatment of impotency in the male, and the powdered root is taken by the Pedis in order to get rid of undesirable thoughts. An infusion of the root of **Alysicarpus wallichii W. and Arn.,** Zulu *in Konazane*, is drunk by the Zulus as an emetic in biliousness and in febrile conditions (Bryant). They also use the leaf as a drench for calves with scours.

The Zulus make the charred and finely powdered stem of **Dalbergia obovata E. Mey.,** Monkey rope, Bobbejaanstou, Zulu *uMancina*, *uManyenyane*, into a paste with water, and apply it locally to sore mouths in infants. They also use the ash in snuff.

The red sap of **Pterocarpus angolensis DC.,** Bleedwood tree, African teak, South African teak, Transvaal teak, Kiaatboom, Kiaathout (E. Transvaal), Zulu *inGozina*, Kololo *mukwa*, Wiko *mukula*, Lamba *umuLombe*, is used by the Zulus, Shangaans, low-veld Sutos, and Rhodesian natives for dysentery. Transvaal and Rhodesian natives and Europeans also use a decoction of the root for malaria and blackwater fever. It is said to be efficacious in the latter. The Lambas use the sap as a local application to a kind of ringworm, which is thought to become leprosy when untreated. They also use it for haemorrhages and as a fish poison. The Rozis and other tribes in Barotseland use an infusion of the root internally, and the smoke from the burning root externally in stomach troubles, fevers, and constipation.

Pterocarpus erinaceus (Poir.) Lam., Bloodwood, Sealing-wax tree, Teak (Transvaal), Kiaathout, Ronga *thondo*, Chicabo *imbilo*, Swahili *mogobire-bire*, Swazi *uShuyane* (?), is the source of African *kino*, which at one time took its place on the commercial markets of the world.[3] Nowadays it has almost gone out of use. Kino has a high *tannin* content.

The root of **Lonchocarpus capassa Rolfe.,** Molana, Thonga *mbhandu*, is burnt and the smoke inhaled by the Thongas to relieve colds. Steyn [19] says that the plant is used by natives as a snake-bite remedy. He dosed a rabbit with 30 grm. of the dried leaf with no effect.

The Zulus use a decoction of the root or leaf of **Abrus precatorius L.,** Lucky bean, Love bean, Jequirity, Prayer beads, Mienie-mienies, Zulu *um Khokha*, as a remedy for pain in the chest. The seed is poisonous, containing *abric acid*, $C_{21}H_{24}N_3O$, and *abrin*, a protein toxin. Abrin consists of two fractions, a *globulin* and an *albumose*, the former of which is the more toxic.[56] The root is known as Indian liquorice, and though it is said to contain *glycyrrhizin*, should not be used as a liquorice root substitute, because it probably has toxic properties similar to the seed.[1]

The whole seed may be swallowed with impunity, because the outer covering is so hard that the seed escapes disintegration and the toxin is not freed. Even if abrin itself is taken by the mouth, it does not with certainty produce toxic effects, for the protein is liable to be digested. Injected intravenously or subcutaneously, abrin is highly toxic, the minimum lethal dose for animals being minute fractions of a milligramme per kilo. There is always a latent period of at least several hours, and sometimes a day or two before symptoms appear. The symptoms are loss of appetite, diarrhoea, and vomiting. *Post mortem*, one finds inflammation of the intestinal mucosa and haemorrhagic effusions into the body cavities and organs. There are foci of necrosis in the tissues, which are thought to be caused by damage to the blood-vessel walls and consequent haemorrhages. It is possible to immunise animals against abrin and to produce an antiabrin-serum.

Abrin, when injected subcutaneously or applied to the eye, produces an intense local inflammation. This action on the eye has been used therapeutically for the treatment of various conditions, but its use is fraught with great danger. It is impossible to control the extent of the inflammation, which may be so severe as to destroy the eye. In India the seed has been used for murder. Scott [68] states that the juice of the plant is a powerful irritant to the mucosae, and that the seed is used for killing cattle in India.

The root of **Neorautanenia coriacea C. A. Sim.** is a native fish poison, but 600 grm. given to a goat by the mouth produced no effects.[66]

The Sutos use **Erythrina zeyheri Harv.,** Suto *mofumo*, *khungana* (seeds only), Zulu *umSinsi*, as an asthma remedy (Phillips). The Zulus and Swazis use the bark as an ingredient in a decoction taken by the mouth for rheumatism, boils, and " blood disorders." A fluid extract of the leaf has apparently been used for gland-tuberculosis.[57] The seed yields 28 per cent. of a bland, nutty *fixed oil* and 4 per cent. of a *volatile oil* belonging to the butyl series of alcohols. The latter contains *erythrol*. It also contains an alkaloid for which the name *erythrine* was originally suggested, but Holmes later recommended *zeyherine*,

a name which has been generally adopted. The fixed oil is purgative. Erythrol has a pungent odour like horse-radish, and is a powerful irritant. It can be used in a liniment for counter-irritation. Zeyherine, like the fluid extract, has been recommended for tuberculosis.[57]

An infusion of the bark of **Erythrina rumeana Spreng.,** Kafferboom, Zulu *umSinsi*, is applied locally by the Zulus for earache, and a hot infusion is used as a fomentation on sprains. The Xosas use a decoction of the root of **Erythrina humei E. Mey.,** Small kaffir tree, Xosa *umSintsana*, as a fomentation and by the mouth in tuberculosis (Smith, Hewat). It is sometimes used for other chest conditions, *e.g.*, bronchitis.

A leaf paste of **Erythrina caffra Thunb.,** Kaffir tree, Coral tree, Cockie doodles, Kafferboom, Zulu *umSinsi*, is one of the ingredients of a poultice applied by the Zulus over the bladder in suspected disease of that organ. The skin is greased before the application. A similar poultice is used in the local treatment of venereal sores. The Zulus also use an infusion of the leaf as ear drops in earache (Bryant). The flower is alleged to have killed chickens, but 60 grm. given to a rabbit by the mouth produced no effects.[66]

Mucuna irritans Burtt-Davy, Fire bean, Brandboontjie, produces a marked irritation of the skin when brought in contact with it. A decoction of the root is said to be an efficient remedy for biliary fever in dogs, and has been tried also in " horse-sickness." **Mucuna coriacea Bkr.,** Brandboontjie, has irritating hairs or spicula. The Senas drink an infusion of the root in large amounts for gastro-intestinal disorders. We are informed that its administration is followed by diuresis, but this may result from the quantity of water drunk.

The Transvaal Zulus and Swazis use an infusion of **Rhynchosia adenodes E. and Z.,** Transvaal Zulu and Swazi *uNgazini*, Suto *monya-madi*, in dysentery. The Sutos administer the crushed root and stem in milk to calves and cattle suffering from the same disease. The Sutos also use a decoction of the root of **Rhynchosia craibaea DC.,** Suto *monya-madi*, *morarana-wa-liphêpa*, as a lotion for rheumatic pains. They snuff the powdered root to relieve headache, and formerly used a decoction of the plant for washing garments made from sheep and goat skins (Phillips).

According to Smith, the Xosas rub the powdered leaves of **Rhynchosia gibba E. Mey.,** Xosa *iYeza-lomoya-olubomvu*, on scrofulous swellings to reduce them. The Zulus use **Rhynchosia sp.,** Zulu *uKhalimele*, as a headache cure (Bryant), possibly by snuffing.

The Zulus drink a milk decoction of the root of **Eriosema salignum E. Mey.,** Zulu *uQonsi*, Suto *lešetla*, *lesapo*, in chest troubles. The Sutos use the plant as a stimulant to bulls in spring (Phillips), and burn it in front of their huts to ward off lightning. Smith states that the Xosas rub the powdered leaves on scrofulous swellings to reduce them, and that they drink a decoction of the root as a remedy for scanty urine.

The Nyanjas of Nyasaland apply a poultice of the leaves of **Eriosema cajanoides Benth.,** Nyanja *nsonka*, *nsonka impwache*, to the skin in smallpox.

A hot milk infusion of the root of **Eriosema cordatum E. Mey.,** Zulu *uQontsi*, Suto *lešetla*, *lesapo-le-lethsehadi*, *setlodi-se-seholo*, and **Eriosema salignum E. Mey.** is taken by Zulu men for impotency (Bryant). The Sutos use **Eriosema**

cordatum E. Mey. as a stimulant for bulls in spring, usually mixed with other plants (Phillips).

The root of **Phaseolus lunatus L.,** Civet bean, Lima bean, Java bean, Burma bean, Sewejaarsboontjie, is thought to be poisonous. It has been eaten, on occasion, by boys in reformatories, the symptoms being giddiness, vomiting, and purging, colic, headache, prostration, rise of temperature, and quick pulse. These symptoms come on about half an hour after ingestion. The root has been tested by us on cats and rabbits, and no toxic effects could be elicited. Nothing is known of its composition and action. The seed contains *phaseolunatin*, $C_{10}H_{17}O_6N$, a *cyanogenetic glucoside*, and yields about one-tenth of 1 per cent. of *hydrocyanic acid* calculated on dry bean.[58] The dark purple beans are said to be the most toxic.[58] The leaf, it seems, also contains phaseolunatin.[59, 69] The Sutos rub the powdered bean of **Phaseolus mungo L.,** Suto *lehlodi*, into scarifications over tumours and abscesses to promote suppuration. They also use the bean as a food (Phillips).

Feeding experiments were done by Steyn[19] with **Vigna vexillata Benth.,** Cowpea, because the plant was suspected of having caused severe symptoms in calves. Four hundred grams of the fresh plant in the preflowering state produced no symptoms of ill-health in a sheep.

Natives, particularly those from Natal, use an infusion of the root of **Dolichos falciformis E. Mey.** as a purgative in abdominal discomfort. The preparation is also emetic.

The Nyanjas of Nyasaland use the root of **Dolichos lupiniflorus N. E. Br.,** Nyanja *nandungwe*, as a fish poison, and it is said to be toxic to human beings.

Farmers in the Knysna district consider that the herbage of **Dolichos gibbosus Thunb.,** Wilde-ertjie, Klimop, Bosklimop, is poisonous to stock (Marloth).

Bowie[62] states that **Aspalathus spp.** are astringent.

Sophora tomentosa L. contains an alkaloid, *sophorine*, which is identical with *cytisine* from Cytisus laburnum and with *ulexine* from Ulex europaeus.[63] Cytisine resembles nicotine in its action (see Nicotiana tabacum : Solanaceae).

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1, 7, 13, 23, 839, 1181, 1230, 1231, 1370, 1382.
2. R. Kobert : Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (2), 748, 1029.
3. A. Tschirch : Handbuch der Pharmakognosie, 1917-25, ii (2), 1409, 1421, 1501 ; iii (1), 26, 32, 56, 59, 62, 91 ; iii (2), 822, 921.
4. W. Peyer and W. Liebisch : Apoth. Ztg., 1928, 43, 1422.
5. J. M. Watt and M. G. Breyer-Brandwijk : Arch. Internat. Pharmacodyn. Thér., 1929, xxxvi, 233.
6. J. M. Watt : Arch. Internat. Pharmacodyn. Thér., 1927, xxxiii, 267.
7. R. Marloth : The Chemistry of South African Plants and Plant Products, 1913, 9, 17.
8. Bull. Imp. Inst., 1917, xv, 112.
9. J. Burtt-Davy : 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 192, 195, 197, 206, 208.
10. C. F. Juritz : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.
11. Bull. Imp. Inst., 1910, viii, 60-61.
12. Bull. Imp. Inst., 1909, vii, 58.
13. Chem. Zent., 1903, ii, 1063.
14. Bull. Imp. Inst., 1913, xi, 411.
15. I. Schapera : Bantu Studies, 1925, ii, 205.
16. C. F. Juritz : So. Afr. J. Indus., 1919, ii, 673.
17. Bull. Imp. Inst., 1928, xxvi, 314.
18. D. G. Steyn : Private Communication quoted by H. H. Curson, J. So. Afr. Vet. Med. Ass., 1927, i, 45.

19. D. G. Steyn : 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 780, 794, 795.
20. J. Muir : J. Med. Ass. So. Afr., 1929, iii, 457.
21. R. F. Bacon : Philipp. J. Sci., 1906, i, 1007, through Chem. Abst., 1907, i, 1162.
22. J. Moss : Pharm. J., xviii, 242, through ref. No. 1.
23. Chief Native Commissioner, Natal : File C.N.C. 2502/17.
24. P. Kamerman : So. Afr. J. Sci., 1926, xxiii, 179.
25. J. Medley Wood : Natal Plants, iv, Plate 390.
26. Bull. Imp. Inst., 1907, v, 258.
27. Bull. Imp. Inst., 1921, xix, 142.
28. E. Maurin : Bull. Sci. Pharmacol., 1922, xxix, 617 ; 1927, xxxiv, 11.
29. R. Moussu : Compt. rend. Soc. Biol., 1925, xcii, 862, through Chem. Abs., 1925, xix, 3320.
30. E. P. Phillips : Botanical Survey, South Africa, Memoir IX, 1926, 17, 18.
31. D. R. O'S. Beare and E. M. Holmes : Lancet, 1902, ii, 282.
32. L. Bostock : Transvaal Med. J., 1907, ii, 273.
33. G. A. Turner : Transvaal Med. J., 1910, v, 119.
34. F. A. Flückiger and D. Hanbury : Pharmacographia, 2nd Edition, 1879, 211.
35. Merck's Annual Report, 1899, 148.
36. E. Heckel and Fr. Schlagdenhauffen : Nouveaux remèdes, 1886, 122, quoted in ref. No. 35.
37. —. Isnard : Nouveaux remèdes, 1886, 365, quoted in ref. No. 35.
38. K. Bhaduri : Proc. Chem. Soc., xxviii, 53, through Chem. Abs., 1913, vii. 2927.
39. H. G. Greenish : Pharm. J., 1881, xi, through ref. No. 7.
40. O. Schmiedeberg : Quoted in ref. No. 2.
41. R. Marloth : Agr. J., Cape of Good Hope, June 1909.
42. I. B. Pole Evans : So. Afr. J. Sci., 1920, xvii, 15, 21, 27.
43. P. Macowan : Cape Agr. J., 1898, xiii, 862.
44. J. Burtt-Davy : So. Afr. J. Sci., 1910, vii, 269.
45. A. Theiler : Agr. J., Union of South Africa, 1911, i, 10.
46. A. Theiler : 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 34.
47. Bull. Imp. Inst., 1916, xiv, 32.
48. Letter from Imperial Institute to J. M. Watt, dated 17th October 1928.
49. A. Theiler : 7th and 8th Rpts. Dir. Vet. Res., Union of South Africa, 1920, 59, 99.
50. P. Macowan : Letter Trans. Agr. J., 1904, iii, 133.
51. M. Hanriot : Comp. rend., 1907, 144, 150, 498, 651, through ref. No. 52.
52. Bull. Imp. Inst., 1915, xiii, 61.
53. F. Tatterfield, C. T. Cunningham, and H. M. Morris : Ann. Appl. Biol., 1925, xii, 61, through Chem. Abs., 1925, xix, 1750.
54. Report of Cattle Diseases Commission, Cape of Good Hope, 1877, 17, through Henning, 11th and 12th Rpt. Dir. Vet. Res., Union of South Africa, 1926, i, 331.
55. L. H. Walsh : South African Poisonous Plants, 1909, 18.
56. C. W. Edmunds and J. A. Gunn : Cushny's Pharmacology and Therapeutics, 9th Edition, 1928, 535.
57. E. Langham and E. M. Holmes : Quoted in Pharm. J., 1910, cxxxiv, 25.
58. W. R. Dunston and T. A. Henry : Proc. Roy. Soc., 1903, cxxii, 285.
59. E. Schmidt : Pharmazeutische Chemie, 6th Edition, 1923, ii (2), 2150.
60. C. F. Juritz : Rpt. Senior Analyst for 1895, Cape of Good Hope, G. 20—1896, 8, 54.
61. James Bowie : So. Afr. Qtly. J., 1830, i, 29.
62. James Bowie : Comm. to South African Institution, 30th September 1829.
63. A. Gomes de Almeida : Bol. Agr. e Pecuário, i, 1931.
64. C. O. Williams : Union of So. Afr. Dept. Agr. Science Bull., 1928, lxiii, 68.
65. E. Merck : Annual Rpt., 1930, 200.
66. D. G. Steyn : 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, Part II, 720, 721, 722.
67. E. H. F. Meyer : Commentarium de Plantis Africae Australioris, 1835, vol. i, fasc. 1, 112.
68. H. H. Scott : The Practice of Medicine in the Tropics, edited by Byam and Archibald, London, 1921, vol. i. 764.
69. P. Guérin : Compt. rend., 1930, cxc, 512, through Qtly. J. Pharm. and Pharmacol., 1930, iii, 276.
70. J. F. V. Phillips : Private Communication.

LI. GERANIACEAE

Geranium incanum L., Mennetjie rabassa, Bergtee, Tee, Vrouebossie, Suto *ngopê-sethsoha*, *tlako*, is one of the South African tea substitutes. The Sutos use it as an anthelmintic (Phillips). An infusion is taken by Europeans as a remedy in venereal diseases.

The Sutos use **Geranium canescens l'Hérit.,** Suto *lehlwele*, *ngopê-sethsoha*, as a dysentery remedy ; and an infusion of the leaves of **Geranium ornithopodum E. and Z.,** Suto *bohila-ba-thaba*, *makôrôtswane*, as a lotion for the

MONSONIA OVATA CAV.

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nose in children with a cold in the head. The application is said to cause sneezing (Phillips).

A decoction of the leaves of **Geranium sp.,** Amara bush, Amarabos, is used to relieve colic.

Various species of **Monsonia** were at one time widely used in the treatment of dysenteries,[1, 2, 3] typhoid fever,[2, 4, 5, 6, 7, 8] intestinal haemorrhage,[4, 9] summer diarrhoea in children,[2] and perimetritic pain.[2] **Monsonia biflora DC.**, Dysentery herb, Assegaaibos, Naaldbossie, Alsbossie, Rabas, Keita, Chuana *ramarungana*, Xosa *iGqitha*, Suto *makôrôtswane*, seems to have been the most popular, but **Monsonia ovata Cav.,** Dysentery herb, Naaldbossie, Rabas, Keita, Xosa *iGqitha*, Hottentot *geita*, *nceta*, and **Monsonia burkei Planch.** have also been used.

These three plants are still used as an infusion or a decoction, though not with the former enthusiasm. **Monsonia biflora DC.** is taken in diarrhoeas and dysenteries, in indigestion and other gastric disturbances, and internally for snake-bite, and is administered to calves for scours. The Chuanas use the powdered root in frequent doses for diarrhoea and dysentery in children, and drink a decoction of the herb for varicose veins and ulcers. The Sutos likewise use the plant as a dysentery remedy and also for sore eyes (Phillips). **Monsonia ovata Cav.** is still used in diarrhoes and dysenteries, as a decoction in feverish colds (it produces sweating), as an ingredient in an anthrax remedy, and as an infusion for stomach complaints generally, and also for the same in calves and lambs. Smith mentions the use of the plant by the Xosas and Fingos for many of these conditions. Pappe states that both root and herb are very astringent, and highly successful in dysentery.

Maberley [7] considered that Monsonia spp. are constipating and depressant of the central nervous system. With the assistance of a chemist, he isolated from them (*a*) an insoluble stable body of unknown composition, which he named *entericin* ; (*b*) another insoluble body named *tericin*, which he apparently regarded as being inactive ; and (*c*) soluble *tannin* bodies. Neither glucoside nor alkaloid was found. Entericin has been used in the same way as galenical preparations of the plants.[5, 6] Marloth,[10] on the other hand, states that the Monsonias yield a green, *resinous body*, which he thinks is the active principle. We have found no information on the properties of these substances.

Sarcocaulon burmanni Sweet., Candle bush, Bushman's candle, Kersbos, Boesman-doring, Hottentot *d/nou d/nou*, is used by the Hottentots as a diarrhoea remedy (Laidler), and the powdered root as a poultice.[13] Laidler evidently regards the plant as being astringent and the root pungent.

Sarcocaulon burmanni Sweet., Sarcocaulon rigidum Schinz., Bushman's candle, Candle bush, and **Sarcocaulon patersoni DC.,** Candle bush, Kersbossie (klein), all contain considerable proportions of wax in the corky bark of the stem.[10, 11, 19] Schultz [11] has investigated the so-called fossilised resin of Namaqualand, which is derived from one or other of these plants. It is not a resin, but yields (*a*) to petroleum ether 18 per cent.—partly true *fat* and partly a body which crystallises from hot alcohol and has a melting point of 73° to 74° C. ; and (*b*) to alcohol 54 per cent., containing *wax*, *sarkokaulin*, a crystalline body, $C_{13}H_{24}O_2$, melting at 78° C., and 0·6 per cent. of a *volatile oil.*

He further isolated 0·85 per cent. of a *gum-like substance* and traces of *magnesium*.

Sarcocaulon sp., Hottentot *p/ngoona*, is used by the Hottentots as an abortifacient in man and sheep (Laidler).

The Sutos use **Erodium cicutarium l'Hérit,** Storksbill, Heronsbill, Suto *makôrôtswane*, as a dysentery remedy, sometimes mixed with **Pelargonium sp.** The plant is a common weed in the western parts of the United States of America, where the sharp-pointed fruits cause considerable trouble by becoming entangled in the wool of sheep and irritating the skin (Pammel). An extract of the plant has been used as a uterine haemostatic in Europe, and it apparently stimulates the uterus to powerful contractions.[12, 13, 14] It has also been recommended for dropsy.[15] Van Dongen [12] states that the plant is non-toxic and that the styptic action is not due to tannin. Wasicky [16] found, on combustion, 12 to 14 per cent. of ash, 40 per cent. of which is *potassium oxide*. He was unable to isolate any organic principle having an action on the uterus. He, however, confirms the fact that extracts of the plant have a powerful peripherally produced effect on the uterus, resulting in an increase in tonus and contractile activity.

Maberley[7] states that a tincture of **Erodium moschatum (L.) l'Hérit.,** Stork's bill, Heron's bill, Muskuskruie, Turknaald, acts in a similar way to tincture of **Monsonia spp.** in dysenteries, etc. Patients, he says, state that it produces an agreeable stimulating effect and slight sweating. He thinks the plant is antipyretic, and does not constipate like preparations of Monsonia spp. It has a musk-like odour (Tschirch).

The Zulus administer an infusion of the root of **Pelargonium aconitophyllum E. and Z.,** Zulu *iNyonkuku, isAndhla-sonwabu*, for diarrhoea, and an infusion of the leaf for scours in calves. They also mix the dried powdered root in porridge or other food in the treatment of dysentery.

An infusion of the root of **Pelargonium transvaalense Knuth.** is taken by Europeans in the Transvaal as a dysentery remedy. The Swazis also use it, and sometimes simply chew the root for this purpose.

The coloured people of the Cape use an infusion of **Pelargonium grossularoides Ait.** *var.*, Cape Flats Coloureds Rooistingel-houtbas, Rooirabas, Nama Hottentot *rabas*, Suto *makôrôtswane, kxwara*, as a remedy to assist expulsion of the placenta after childbirth. **Pelargonium anceps Willd.,** Cape Malay *Rooi rabassam*, seems now to be regarded as *identical* with **Pelargonium grossularioides Ait.** Pappe states that the Cape Malays used a decoction of it to procure abortion, to cure suppression of the menses, and to promote parturition. The Namas use the plant in the treatment of anaemias, fevers, and general weakness (Laidler).

Pelargonium reniforme Curt. Bot. Mag., Rabassam, Rabas, Rooirabas, Xosa *iYeza-lezikhali*, Suto *kxwara-e-nyenyane*, is used as a dysentery and diarrhoea remedy, usually as a decoction made often with milk. The Sutos use the plant as a colic remedy (Phillips). Smith says the leaf, on boiling, yields a *mucilage* which has been used to cover wounds and so prevent the deposition of insects' eggs. He says also that the root is astringent, and produces a good effect in dysentery. The Xosas tie a piece of the root in the mouth of

horses to prevent purging while on the road. Hewat mentions similar uses, and Atherstone [17] states that the plant is astringent.

A decoction of **Pelargonium fumarioides l'Hérit.,** Rooirabas, Suto *makôrôtswane-o-monyenyane,* is used to bring on the menstrual flow and, along with celery and mint, to procure abortion.

Natives chew the leaf of **Pelargonium pulverulentum Colv.** as a remedy for haemorrhoids. The plant has also been used as a " war " medicine.

The Xosas use a paste of the leaf of **Pelargonium alchemilloides Willd.,** Xosa *inKubele,* Suto *bodila-ba-thaba, makôrôtswane,* as a healing application to wounds and abscesses after the pus has been drawn out by another remedy (Smith, Hewat). A decoction of the root of **Pelargonium alchemilloides Willd., *var.* dentatum Harv.,** Suto *bodila-ba-dithswene, bodila-ba-thaba,* is used by the Sutos to wash feverish patients (Phillips).

The Nama Hottentots use the tuber of **Pelargonium antidysentericum (E. and Z.) Harv.,** Nama *t/namie, d/kanie,* boiled in milk in the treatment of dysenteries and diarrhoeas (Laidler, Hewat). Laidler regards it as astringent.

An infusion of **Pelargonium ramosissimum (Cav.) Willd.,** Sinkinsbossie, Dassieboegoe, is taken for neuralgia and similar conditions (Wicht). The Xosas use the plant as a remedy for colds and in threatened consumption (Smith). Smith states that a tincture is preferable to a watery preparation, as the latter is apt to upset the stomach.

According to Burtt-Davy,[18] a decoction of **Pelargonium sidoides DC.,** Kalwerbossie, and **Zizyphus zeyheriana Sond.** is used as a remedy for worms in calves.

Pappe states that the scarlet-coloured root of **Pelargonium triste (L.) Ait.,** Kaneelbol, is somewhat astringent, and was used formerly in diarrhoeas and dysenteries and as an anthelmintic. He records also the use of the sap of **Pelargonium scutatum Sw.,** Kaffir sorrel, Kaffersuring, in sore throat, aphthae, etc. He states that it is astringent and antiseptic. A decoction of **Pelargonium cucullatum (L.) Ait.** (Geranium cucullatum), Wilde malva, has been used in colic, nephritis, and suppression of the urine, by the mouth or as an enema (Hewat). The root has been used as a diarrhoea remedy and the leaf as a dressing for open sores (Wicht). Thunberg and Pappe say it is emollient.

The leaf of **Pelargonium bowkeri Harv.,** Suto *kxoara,* is eaten by Bushmen and Sutos. The latter also use the plant as a remedy for " flushings, colic, and diarrhoea " (Phillips).

Thunberg states that the red root of the common geranium, Pelargonium spp., is astringent, and was used in diarrhoeas and dysenteries.

Pelargonium sp., Swazi *umaDolwana,* enters into the composition of a decoction used for gonorrhoea by the Transvaal Zulus and Swazis.

Hottentots and Europeans use a decoction or infusion of the leaf of **Pelargonium sp.,** Wilde milde, as an external application to inflammations of the skin. The preparation is said to be soothing and cleansing.

The **Pelargoniums,** in general, are regarded as producing benefit in dysentery. Marloth [10] states that most species contain a considerable amount of *oxalate* and *malate of calcium.* Bowie states that the herbs are slightly

acrid and acid and astringent, that the leaf was used by the Hottentots as a tea, and that the roots of several species were taken in the treatment of syphilis.

Geranium oil from **Pelargonium spp.** cultivated in South Africa has been found to compare favourably with Algerian oil, and has been investigated in regard to possible commercial exploitation.[20, 21]

REFERENCES

1. J. Maberley: Lancet, 1897, i, 368 and 433.
2. J. Maberley: So. Afr. Med. Record, 1904, ii, 84.
3. G. Thornton: Transvaal Med. J., 1907-08, iii, 193.
4. W. Darley Hartley: So. Afr. Med. Record, 1904, ii, 27.
5. J. Maberley: Transvaal Med. J., 1908-09, iv, 175, 279.
6. J. Maberley: Transvaal Med. J., 1909-10, v, 73.
7. J. Maberley: Transvaal Med. J., 1911-12, vii, 2.
8. R. P. Mackenzie: Transvaal Med. J., 1908-09, iv., 224.
9. W. Darley Hartley: So. Afr. Med. Record, 1904, ii, 80 (editorial note).
10. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 9, 10.
11. H. Schulz: Inaugural Diss. Bern., 1906.
12. J. A. van Dongen: Chem. and Drug., 1916, lxxxviii, 41; J. Pharm. Chim., 1916, xiii, 256, both through Chem. Abs., 1916, x, 2124.
13. L. Kroeber: Pharm. Zentralh., 1922, lxiii, 437, 465, through Chem. Abs., 1922, xvi, 4297.
14. L. Komorowitsch: Wratsch, 1896, ix; Semaine medicale, 1896, xvi, both through Merck's Ber., 1896, 62.
15. W. Abbot Smith: Amer. J. Med. Sci., 1865, through United States Dispensatory, 1926, 21st Edition, 1293.
16. R. Wasicky; Wien. Klin. Wochenschr., 1919, xxxii, 1; Zent. Biochem. Biophys., xx, 511, both through Chem. Abs., 1920, xiv, 311.
17. —. Atherstone: See Flor. Cap., 1894, i, 300.
18. J. Burtt-Davy: So. Afr. J. Sci., 1909, vi, 388.
19. Agr. J., Cape of Good Hope, 1899, xiv, 183.
20. W. H. Simmons: Perfumery Essent. Oil Record, 1928, xix, 431, through Chem. Abs., 1929, xxiii, 931.
21. Bull. Imp. Inst., 1931, xxix, 38.

LII. OXALIDACEAE

According to Smith and Hewat, the Xosas and other natives use the dried powdered root of **Oxalis smithii Sond.,** Xosa *umMuncwane* (generic name for Sorrels), *uZotho*, *inKolwane*, as a tape-worm remedy. The Zulus use the bruised leaf of **Oxalis semiloba Sond.,** Zulu *isiThathe*, *isiNungu*, to rub over the mouths of infants suffering from thrush and like conditions.

The leaf of **Oxalis purpurata Jacq.,** Xosa *umMuncwane*, is said to quench thirst when chewed, and to poison sheep when eaten in large quantities.

Thunberg records that **Oxalis cernua (Thunb.) L.,** Sorrel, Wilde suring, Geel suring, Klawer suring, Pyp-suring, was used by the early Cape settlers in preparing a good and serviceable *sal acetosellae* (oxalic acid preparation) or salt of wood sorrel. Pappe confirms the fact that it contains a good deal of *oxalic acid*. He mentions that the raw bulb was used as an anthelmintic. Marloth [1] states that the root is eaten, and that the plant contains bioxalate of potash.

The Sutos use **Oxalis corniculata L.,** Suto *bodila-ba-thaba*, in making a lotion for washing snake-bites (Phillips). Pammel states that the juice is used in America as an antidote against poisoning by the seed of Datura stramonium L.

REFERENCE

1. R. Marloth: The Flora of South Africa, 1925, i, 1, 92, 93.

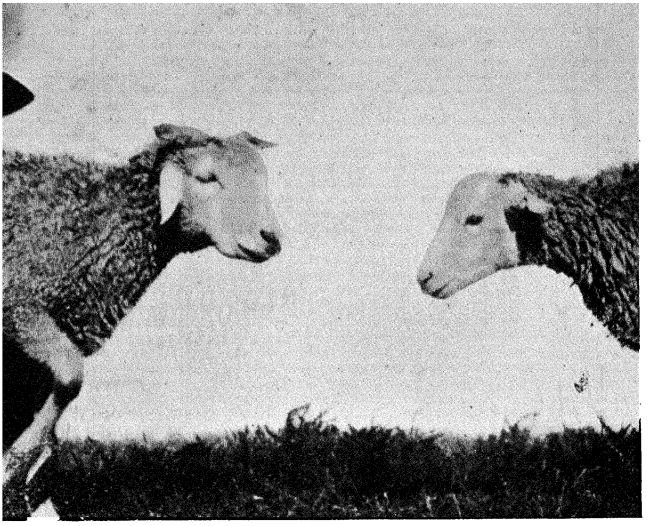

FIG. 1.

FIG. 2.

GEELDIKKOP. Poisoning by Tribulus terrestris L.

FIG. 1.—Sheep on Left suffering from Geeldikkop. Note the Swelling of the Head. Sheep on the Right, Normal.

FIG. 2.—Peculiar raising of the Head, which is sometimes a very Early Symptom of Geeldikkop.

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LIII. LINACEAE

The Sutos use **Linum africanum L.,** Wild flax, Suto *tenane, moholwa,* as a love philtre. Phillips records that **Linum thunbergii E. and Z.,** Suto *bohlokwana,* is a Suto remedy for relieving pain and for snake-bite.

LIV. ZYGOPHYLLACEAE

Thunberg mentions that **Zygophyllum herbaceum Repens.** and **Zygophyllum sessilifolium L.,** known as *nenta* by the Hottentots, are said to be poisonous to sheep.

Zygophyllum microcarpum Lichst., Ou-ooibos, Armoedsbos, Sandrepuis, is suspected of having caused heavy mortality in sheep.[1] A rabbit dosed with 25 grm. of dried flowering material developed diarrhoea, accompanied by quickening of the pulse and respiration and ending in paralysis. It died after four days. *Post-mortem* examination revealed a state of gastro-enteritis with fatty changes in the liver, kidney, and myocardium. A sheep developed a similar condition after receiving 600 grm. of the plant (Steyn [1]).

The Chuanas use a cold infusion of the root of **Tribulus terrestris L.,** Devil's thorn, Dubbeltjie-doring, Duiweltjies, Môrester, Volstruisdoring, Caltrop, Chuana, and Suto *thsêhlo,* Chuana *sekanama,* for catarrh of the stomach and as a purgative in cattle. The Zulus lay the thorny fruit, on which is smeared snake venom, at the entrances to kraals to prevent the entry of undesirables. With **Andropogon contortus,** it is a Suto rheumatism remedy (Phillips). In India the plant, under the name of *burra gookeroo,* or *burra gokhroo,* is used as a diuretic and aphrodisiac.[2] The plant is the cause of *geeldikkop* (*dikgeel*) in small stock, a condition characterised by oedema of the head, fever, and jaundice.

Geeldikkop was first described by Hutcheon,[3] who thought that it was primarily a derangement of the liver, though one of his assistants, Elley,[4] later expressed the opinion that the oedema was the primary lesion. The symptoms and *post-mortem* findings have been described in great detail by Hutcheon,[3, 6] Dixon,[5, 16] and Theiler.[7]

Fever is an early symptom, sometimes being evident before any other sign, but most commonly occurring after the onset of the head swelling. It usually follows a typical curve, which we illustrate from Theiler.[7] Sometimes the fever is more continuous in character, sometimes irregular. The sheep, meanwhile, is dull and dejected, with hanging head and drooping ears. Dixon [5] states that one of the earliest signs is catarrh of the eyes and nose and infection of the conjunctiva. The sheep refuses to eat, and seeks the shade. Sometimes an extreme degree of restlessness ushers in the disease. In Theiler's feeding experiments, these symptoms appeared in from nine to fifteen days, though farmers state that they develop within forty-eight hours. " In some cases the animals stand continuously with the head bent rigidly backwards, the eyes staring vacantly into space. In other cases the patient stands with its

head pushed against the kraal wall " (Paine [8]). Theiler [7] states that the rigid backward bending of the head is seen most commonly in cases which are restless (see illustration No. 2 from Theiler [7]). The swelling from which the disease receives its name then begins to appear about the head, affecting usually the upper lips and nostrils first, then the ears, then the dorsum nasi and forehead, infraorbital regions, cheeks, masseter region, chin, and finally the submandibular space. According to farmers, the swelling sometimes affects the legs, and Hutcheon [9] records that he has seen shedding of the fleece and inflammation of the coronary band or cushion. The infiltration is at first clear, later yellow. The swellings to begin with are warm and painful, and the sheep scratches them or taps them with the fore leg. Shaking of the head and grinding of the teeth are regular features, and catarrh of the nose and eyes is common. Often the fluid transudes from the swollen areas. The swellings last for three to five days and then begin to disappear. The skin now becomes hard and dry and the lips and ears lose their pliability. The drying-out process takes about a week, and leads to necrosis of the skin to a varying degree. The skin also cracks, and purulent sores result. The necrosis is most marked in the ears. From the fourth to the tenth day, but usually coinciding with the pinnacle of the fever curve, a lemon-yellow coloration of the mucosae, conjunctivae, and sclerae appears. The colour deepens gradually to a green-yellow. Often, in fatal cases, the icterus increases in severity, the temperature meanwhile falling by lysis till the animal collapses. Occasionally, affected sheep suffer from lameness followed by a malformation of the hoofs resembling that of styfsiekte of cattle. Death, in experimental cases, occurred in eleven to thirteen days as a rule. Affected animals show marked anorexia and emaciate rapidly. According to Dixon [5] they usually die in a comatose state.

Post mortem, the carcass is usually greatly emaciated and there is a marked yellow coloration of the visible mucosae and of the conjunctivae. In opening the carcass, all the tissues and tissue fluids are found to be yellow, especially any fat which has persisted. The intestines contain no bile, but the gall-bladder, bile ducts, and biliary ducts are distended with it. Indeed, in one of Theiler's cases, the gall-bladder had ruptured before death. The liver is normal in size, yellow to green in colour, often saffron-coloured, and soft in consistence. Dixon [5] and Hutcheon [6] state that there is catarrh of the small intestine and hepatic duct, but Theiler [7] did not find this, but mentions that the mucous membrane of the small intestine was occasionally injected in some places. The kidney and spleen are usually slightly larger than normal but show no structural change, apart from apparent necrosis of cells containing bile pigment. The heart and lungs are normal, except for pigmentation.

The disease in the early days was ascribed to various causes: malarial infection, drinking water when the animal was in a heated state, ingestion of Tribulus terrestris L., and ingestion of a grub found on this plant.[5, 6, 8] **Tribulus terrestris L.** repeatedly came under suspicion, but all experiments, aimed at producing the disease by feeding the plant, failed.[5, 8, 10, 11] It was, however, noticed that the disease usually occurred on farms where the plant was found, that it was more prevalent in those parts of the affected farms

FIG. 3.

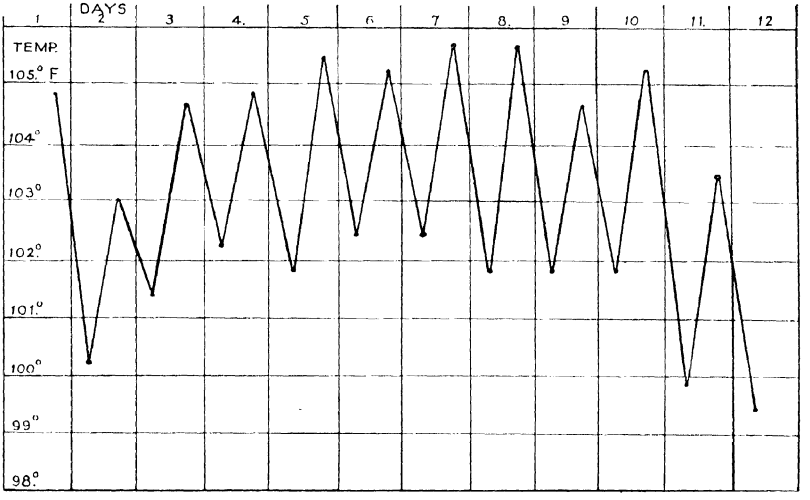

FIG. 4.

GEELDIKKOP. Poisoning by Tribulus terrestris L.

FIG. 3.—Geeldikkop Fully Developed. Shows Swelling of the Lips, Cheek, and Ear.

FIG. 4.—Temperature Chart of a Sheep which Died from Geeldikkop. The record begins eight days after the commencement of feeding of Tribulus terrestris L.

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where the plant was abundant, and usually broke out after a rain followed by a continuous hot wind.[5, 9, 11] It was also noted that if rain was continuous and the plant remained green, then geeldikkop did not appear.[11] Theiler [7] has proved that the disease results from ingestion of the plant in flower, but, from his observations, is of the opinion that it produces the intoxication only when fed on hot days. This is interesting in relation to the records of Dixon[5, 11] and Hutcheon.[9] Quin,[12] as a result of experiment, found that green, fresh Tribulus can be fed to sheep with impunity, but that when they are fed on brown wilted plants, 70 per cent. develop geeldikkop.

In a later publication,[13] Quin alters this opinion as a result of further experiments. Lambs grazed in paddocks on (*a*) young preflowering plants, (*b*) flowering plants, and (*c*) plants in mature fruiting stage, develop the disease in equal incidence, and after about the same period. He finds that the fresh plant juice and watery extracts of the dried plant are highly toxic to sheep, the symptoms of geeldikkop being noticeably absent. Sheep dosed with plant juice die within a few hours, without symptoms. *Post mortem*, the only change observed is a dark brown coloration of the blood. After the watery extract, sheep show dyspnoea, dark brown discoloration of the conjunctivae, and finally coma, with twitchings and convulsions. *Post mortem*, the striking thing again was the brown coloration of the blood, which showed an absorption band between the C and D lines. It would appear, therefore, that the toxic effect of the principle is on the haemoglobin. Direct application of the aqueous extract of the dried plant to corpuscular suspensions or to haemoglobin solutions produces the same change in the absorption spectrum.

All attempts at transmitting the disease by inoculation of the blood of affected animals, or of the fluid from the swellings, have proved negative.[4, 5, 6, 7, 9, 14] The condition is neither infectious nor contagious. There seems little doubt, therefore, that geeldikkop is an intoxication following the ingestion of Tribulus terrestris L., but the condition presents a most puzzling problem in regard to the mechanism of its production. It appears to be primarily an affection of the liver and of the cutaneous and subcutaneous tissues of the head, and sometimes other parts of the skin free from wool.[7] Theiler thinks that these two processes may be simultaneous, but that the skin condition is perceptible at an earlier stage of the intoxication than the liver lesion.

A decoction of the root of **Balanites aegyptica Delile.**, Tonga *umNulu*, is a Tonga emetic. Pammel states the plant contains *saponin*. Apparently the *oil* is used as a remedy for sleeping sickness in Uganda and as a purgative in the Sudan. Cushny has proved that the oil produces no benefit in sleeping sickness, and is only slightly aperient.[15]

REFERENCES

1. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 801.
2. United States Dispensatory, 1926, 21st Edition, 1234.
3. D. Hutcheon: Rpt. by the Colonial Vet. Surg. for the Year 1886, Cape of Good Hope, G. 14—1887, 34.
4. S. Elley: Rpt. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Year 1906, Cape of Good Hope, G. 30—1907, 41.

5. R. W. Dixon: Rpt. of the Colonial Vet. Surg. and Assist Vet. Surgeons for the Year 1899, Cape of Good Hope, G. 35—1900, 33-34, 37.
6. D. Hutcheon: Rpts. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Half-year ended 30th June 1904, Cape of Good Hope, G. 41*—1904, 35-37.
7. A. Theiler: 7th and 8th Rpts. Dir. Vet. Research, Union of South Africa, 1920, 1.
8. R. Paine: Rpts. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Half-year ended 30th June 1904, Cape of Good Hope, G. 41*—1904, 35, 36.
9. D. Hutcheon: Rpt. of the Colonial Vet. Surg. and Assist. Vet. Surgeons for the Year 1899, Cape of Good Hope, G. 35—1900, 33-34.
10. R. W. Dixon: Rpt. of the Colonial Vet. Surg. and Assist. Vet. Surgeons for the Year 1895, Cape of Good Hope, G. 41—1896, Annexure, 123.
11. R. W. Dixon: Rpts. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Half-year ended 30th June 1904, Cape of Good Hope, G. 41*—1904, 35.
12. J. I. Quin: J. So. Afr. Vet. Med. Ass., 1928, i (2), 43.
13. J. I. Quin: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 765, and 16th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1930, 417.
14. J. Spreull: Rpts. of the Colonial Vet. Surg. and Assist. Vet. Surgeons for the Year 1903, Cape of Good Hope, G. 41—1904, 75.
15. A. R. Cushny: Bull. Imp. Inst., 1908, vi, 366.
16. R. W. Dixon: Agr. J., Cape of Good Hope, 1899, xiv, 782.

LV. RUTACEAE

Fagara capensis Thunb. (Xanthoxylum capense Harv., Fagarastrum capense Don.), Wild cardamom, Knobwood, Fever tree (E. Prov.), Wilde kardemon, Kardemon, Knoppiesdoring, Knophout, Perdepram, Pramdoring, Perdeboom (E. Prov.), Perdepis (E. Prov.), Parapis (E. Prov.), Maagbossie, Bobo, Xosa and Pondo *umLumgu-mabele*, Xosa *umNika-ndiba*, *umNungu-mabele*, Zulu and Tonga *umNungwane*, Pedi *monokwane*, is and has been widely used as a medicine among both Europeans and Natives. Thunberg stated that the berry is acrid and was used for colic, particularly flatulent colic, and palsy. Pappe records similar uses. Wicht confirms this carminative action, and says that the berry is also stomachic. An infusion of the leaf is used by Zulus (Bryant) and Europeans for stomach and intestinal disorders generally, and also for intestinal parasites, the Zulus using it with **Asparagus virgatus Bkr.**, **Indigofera cylindrica DC.**, and many other plants. Hewat states that natives use a decoction of the plant against round-worms. Europeans, Zulus (Bryant) and Xosas (Smith) drink a decoction of the root for snake-bite. Natives, especially the Pondos, use a decoction of the bark for gall-sickness in cattle. A decoction and infusion of the leaf, sometimes made with **Artemisia afra Jacq.**, is much used by Europeans and Natives in febrile conditions. The treatment is said to be good for cold in the head, and was very popular during the influenza epidemic in 1918. Hewat says that a decoction of the root and bark is beneficial in cough and pleurisy, and Bryant that the Zulus use the root as one of the ingredients of a decoction used to relieve violent chronic cough. The infusion has a disagreeable odour and is said to produce sweating.

The Pondos take the powdered root by the mouth for pimples and " blood-poisoning " generally. They also use this as a dressing for hollow teeth to relieve toothache. The Zulus (Bryant) use the root-bark and the Xosas (Smith) a paste of the inner stem-bark in a similar way. Hewat mentions that the bark is sometimes chewed by natives for this purpose. The Zulus also use a decoction of the root-bark, made with a large number of other plant

remedies, for tuberculosis and paralysis. The Tongas use a decoction of the root for bronchitis (Stevenson-Hamilton), and the Pedis as a mouth wash for aphthae in children, as a lotion for acne, and also internally (Watt and van Warmelo). Together with that of **Solanum incanum**, the decoction is taken for chest troubles by the Pedis, and the powdered root is smeared over sores and like lesions (Watt and van Warmelo). The plant is widely used by natives to " disinfect " anthrax-infected meat, either by boiling it with the leaves or by drinking a leaf infusion after eating the roasted meat.

The root is apparently bitter. Pole Evans [1] says the fruit contains an *oil*, and Marloth [2, 3] a *pungent principle*, but no glucoside nor alkaloid. Juritz [4] has isolated, from the root and twig, a *resinous body*, *tannins*, and traces of a *yellow colouring matter*. He states that these products are not toxic.

Fagara thorncroftii Verdoorn, Wild cardamom, is used in much the same way as Fagara capensis Thunb.

The Pondos use the powdered bark of **Fagara davyi Verdoorn,** Knobthorn, Knobwood, Perdepram, Zulu *umNungu-mabele*, as an emetic in cases of snake-bite, and also rub the powder into the wounds. The Zulus eat the cooked powdered bark in small amounts at frequent intervals for bad coughs and colds ; they also use a decoction of the root-bark as a tonic in man and animal.

A decoction of the leaf of **Ruta graveolens L.,** Rue, Ave grace, Herb of grace, Herb of repentance, Countryman's treacle, Wynryk, Wynruit, Binnewortel, is used in fevers. The leaf juice is given to infants and children with convulsions and fits, and the bruised leaf is placed in hollow teeth and the ears to relieve toothache and earache respectively. Sometimes, when *in extremis*, children are bathed in a decoction of the plant. This is credited with producing recovery. An infusion is used by adults for respiratory and heart diseases. The Chuanas and Kwenas administer a decoction in large doses to ease childbirth. Pijper says a honey of Wynruit leaf is used in the Transvaal for cardiac asthma, and the bruised leaf in jaundice and infantile diarrhoea. The active principle of the plant is a yellow or greenish *volatile oil*, which occurs in very small proportion in the herb and root but in somewhat greater amount in the seed. This oil is acrid and irritant and has an unpleasant odour. A glucoside, *rutin*, $C_{27}H_{32}O_{16}$ $2H_2O$, or $C_{27}H_{30}O_{16}$, which consists of yellow needles melting at 190° C., and a *cumarin-like odoriferous principle*,[5, 6, 8] have also been isolated.

The herb and the volatile oil have been widely used in the past as a stomachic, an emmenagogue, an abortifacient, and an anthelmintic, as well as in hysteria and in epilepsy. The oil is frequently used to procure criminal abortion, though in ordinary doses it appears to have practically no effect on the uterus. Poisoning by the oil is characterised by gastro-enteritis.[5, 6, 8]

The seed kernel of **Calodendron capense Thunb.,** Cape chestnut, Wild chestnut, Wilde kastaiing, is bitter, and yields 59·2 per cent. of a lemon-yellow, slightly cloudy, faintly bitter *fixed oil*, which is suitable for soap-making, but is not edible on account of its bitterness.[7]

Barosma crenulata Hook. (Barosma crenata (L.) Kunze), Buchu, Short buchu, Round buchu, Long-leaf buchu, Boegoe, **Barosma betulina Bartl. and Wendl.,** Buchu, Nama Hottentot *sab*, *p/nkaou*, and **Barosma serratifolia**

Willd., Long buchu, Boegoe, Bergboegoe, Fontein-boegoe, Olifantsboegoe, are each a source of commercial Buchu leaves, though now the official source is Barosma betulina only. Buchu leaves are a very widely used household medicine in South Africa, usually as a brandy tincture or as a vinegar. These preparations have a great reputation in kidney disease and as a local application to bruises, etc., though Buchu has been used for almost every disease which afflicts mankind. We owe the introduction of Buchu into medicine to the Hottentots. According to Pappe, an infusion was formerly used to stimulate perspiration in rheumatism and gout, and the leaf as a remedy in cholera, in catarrh of the bladder, in urinary diseases, and dropsy, as a digestive tonic, and as a bath in rheumatism.

The active principle is a *volatile oil*, which occurs to the extent of 1 to 2 per cent. in the leaf. It has a peppermint-like odour. This oil is slightly antiseptic (like many other volatile oils), and contains a high percentage of *diosphenol*, $C_{10}H_{15}O_2$, known as *buchu camphor*. The oil is slightly diuretic.[5, 8] There is no reason to continue the use of buchu or its oil in medicine in view of the introduction of more efficient urinary antiseptics and diuretics.

The leaf of **Barosma venusta E. and Z.** has been suggested as a substitute for Barosma betulina.[8] It is smaller than that of the latter. Though it yields up to 4·12 per cent.[23] of *volatile oil*, this contains no diosphenol, but up to 43 per cent. of *myrcen*, a hydrocarbon.[9, 10] For further constituents of the oil, see references Nos. 9, 10, and 11.

The leaf of **Barosma pulchellum (L.) Bartl. and Wendl.** resembles closely that of true buchu. The odour, however, is like that of citronella oil.[8] The leaf yields 3 per cent. of a golden-yellow *volatile oil*, which contains a high proportion of *citronellal*.[12] According to Tschirch the plant is inferior in action to Barosma betulina.

The leaf of **Barosma eckloniana Bartl.** is shorter, wider, and rounder than the true buchu leaf, and has sometimes been marketed for buchu. It is used as a buchu substitute.[8] Another South African species of buchu is **Barosma peglerae Dummer**, but we have no information of its being used.

Agathosma microphylla Mey., Stembuck-buchu, Steenbokboegoe, has a strong, aniseed-like odour, and the leaf yields 2 to 5 per cent. of a yellow *volatile oil*, the percentage varying with the season of collecting and drying—summer less, winter more. The oil contains no diosphenol.[13]

An infusion of the leaves of **Agathosma sp.** (=*Galpin* 5025 *in So. Afr. National Herbarium*), Kanferbos or Kamferbos, is taken for kidney troubles. The plant has probably no very marked action, for sheep eat it with impunity.

An infusion of the leaf of **Diosma vulgaris Schl.,** *var.* **longifolia Sond.,** Wild buchu, Kanferbos or Kamferbos, is taken as a medicine for kidney disease and for colds. The leaf is also used as a tea substitute.

Diosma succulenta L., *var.* **bergiana H. and S.,** Karroo buchu, has been marketed under the name of buchu.[8] Sage[14] has isolated from the leaf a small amount of a semi-solid *volatile oil* with a peppermint odour.

The leaf of **Empleurum serrulatum Ait.** is often used as an adulterant of buchu. It is more acrid in taste and has not the action of true buchu.[8, 15]

The Zulus drink an infusion of the root of **Orygia decumbens Forsk.**, Zulu *iNyongwane*, for biliousness and in larger quantities as an emetic for the same condition. They also take the powdered root of **Vepris lanceolata Don.** (Toddalia lanceolata Lam.), White ironwood, Ironwood, Witysterhout, Zulu *umZane*, as a remedy for colic and influenza. It acts as an emetic. The bark contains 2·01 per cent. of *tannin*.[16] The fruit is known as "African cubebs" and sometimes occurs as an adulterant of cubebs.[17]

Clausena inaequalis Bth. (Myaris inequalis Presl.), Perdepis, Lemoenhout, Zulu and Xosa *umNukambiba*, is used by Europeans in febrile conditions (Wicht). He states that it is diaphoretic, and that it has been recommended for the treatment of rheumatic fever; he has tried it clinically in this disease and says it is useless. The Zulus (Bryant) and other natives (Hewat) use the leaf as an anthelmintic, and the Xosas (Smith) as a remedy for sick calves. Braun[17] says the plant has a pleasant smell and is used by the natives in East Africa for its odoriferous properties.

The juice of **Citrus aurantium L.** (Citrus vulgaris Risso.), Lemon, Suurlemoen, is used with salt as a ringworm remedy (Wicht). In the Transvaal a cough remedy is made by mixing lemon juice 2, salt 1, and honey 10, and a remedy for a cold is a teaspoonful of lemon juice with ginger (Pijper). Samples of South African orange oil have been investigated with a view to commercial exploitation, but though they are almost identical physically with Sicilian oil, they are inferior in aroma and strength.[24]

The round medium-sized fruit of **Citrus grandis Osbeck** (Citrus decumana L.) is known as pomelo or grape-fruit, while the large, more pyriform varieties are called shaddock, pampelmoes, or pompelmus. Hill-grown grape-fruit from Florida has been stated to cause a rapid disappearance of sugar from the urine of diabetics, an action which is thought to be due to an enzyme.[18] The results are claimed to be more lasting and fundamental than those of insulin.[18] Lowland-grown fruit is useless, or even harmful.[18] Editorial comment in the *Journal of the American Medical Association*[19] states that there is no scientific foundation for this use, an opinion with which we agree. The flower yields a *volatile oil*[20] and a glucoside *naringin*,[21] which has also been isolated from the fruit to the extent of 2 per cent.[20] Naringin, which was formerly known as *hesperidin* and *aurantiin*, gives on hydrolysis *naringenin*, 5 . 7 . 4 . trihydroxyflaranon.[20] The fruit rind yields a volatile oil known as *pompelmus oil*,[20, 22] containing 26 per cent. of *citral*.[22]

REFERENCES

1. I. B. Pole-Evans: So. Afr. J. Sci., 1920, xvii, 13.
2. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 10.
3. R. Marloth: Quoted in Report of the Senior Analyst for the Year ending 31st December 1906, Cape of Good Hope, 31.
4. C. F. Juritz: So. Afr. J. Sci., 1914, xi, 122.
5. N. Evers: The Chemistry of Drugs, 1926, 164, 176.
6. R. Kobert: Lehrbuch der Intoxikationen, 1906, ii (1), 146, 530.
7. Bull. Imp. Inst., 1922, xx, 5.
8. United States Dispensatory, 1926, 21st Edition, 240, 1455.
9. E. Goulding and O. D. Roberts, J. Chem. Soc., 1914, cv, 2613.
10. H. R. Jensen: Pharm. J., 1913, xc, 60.
11. J. C. Umney: Perf. Essent. Oil. Rec., 1914, v, 428, through Chem. Abs., 1915, **ix, 844.**
12. Anon.: Schimm. Semi-Ann. Rpt., 1909, 94, through Chem. Abs., 1909, iii, 1908.

13. J. L. B. Smith and K. A. C. Elliott: Trans. Roy. Soc. So. Afr., 1928, xvii, 23.
14. C. E. Sage: Chem. and Drug., lxv, 506, 787, through ref. No. 8.
15. M. M. Rindl: So. Afr. J. Sci., 1917, xiv, 56.
16. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.
17. K. Braun: Arch. Pharm., 1927, cclxv, 47, 60.
18. Taylor and Alter: Mich. State Med. Soc. J., October 1927, through Pharm. J., 1928, cxx, 35.
19. J. Amer. Med. Ass., 1928, xc, 696.
20. C. Wehmer: Die Pflanzenstoffe, 1911, 401.
21. Y. Asahima and M. Inubuse: Ber., 1928, lxi, 1514, through Qtly. J. Pharm., 1929, ii, 107.
22. J. Gattefosse: La Parf. moderne, 1922, xv, 89, through Chem. Abs., 1923, xvii, 1300.
23. C. F. Juritz: Rpt. Chief Chemist (Cape Province) for 1910, U.G. 16—1912, 26.
24. Bull. Imp. Inst., 1930, xxvii, 284.

LVI. BURSERACEAE

Commiphora africana Endl. (Balsamodendron africanum Arn.), African corkwood, Chuabo *naloa* (?), occurs in South Africa but is not used medicinally, though it is so used in East Africa.[1] It yields a *gum*,[2] resembling gum arabic,[3] and also a *resin*.[2] Its fruit and that of *var.* **abyssinica,** Ronga *šišengwi* (?), is taken by the Rongas for stomach troubles (de Almeida).

The natives on the coast of Moçambique apply the leaf of **Commiphora caryaefolia Oliv.,** Ronga *sumba-nkanye*, to wounds (de Almeida).

The berry of **Commiphora pyracanthoides Engl.** is said to produce a stinging sensation in the mouth, followed after some days by swelling and burning of the lips.

REFERENCES

1. K. Braun: Arch. Pharm., 1927, cclxv, 48.
2. Bull. Imp. Inst., 1910, viii, 357: 1911, ix, 180.
3. M. Labraude: Ann. Musée Colon. Marseille, 1925 (4), iii, 5, through Chem. Zent., 1928, i, 590.

LVII. MELIACEAE

The powdered wood of **Ptaeroxylon utile E. and Z.,** Sneezewood, Nieshout, Xosa *umThathi*, *umThothe*, is intensely irritating and readily produces sneezing. This effect is made use of by the Xosas to relieve headache by snuffing the powder. An infusion of the powder is used as a wash for cattle to rid them of ticks, and an alcoholic extract of the wood is used in treating "fits." According to Hewat, natives apply the resinous juice, which exudes from the heated wood, to lupus and warts. The wood contains an exceedingly *bitter principle* which is neither alkaloidal nor glucosidal.

Nymania capensis (Thunb.) Lindb., Chinese lanterns, Kiepkiepies, Klapperbos, Stuipebos, Stinkbos, is used by Europeans (Wicht) and Hottentots (Laidler) for the treatment of convulsions.

The Zulus use the root and bark of **Turraea floribunda Hochst.,** Zulu *uMadlozane*, *umVuma*, medicinally—the root as an emetic in rheumatism, dropsy, and heart diseases (Bryant), the bark by witch doctors as an emetic in preparation for dances. Bryant says that **Turraea obtusifolia Hochst.,** Zulu *umHlatholana*, is poisonous, but that the Zulus use it as a remedy for

abdominal troubles, and an infusion of the root or trunk bark, or of the leaf, as a drastic purgative.

Melia azedarach L., Bead tree, Indian lilac, Indian azadirach, Cape syringa, Pride of India, Chinese umbrella tree, China tree, China berry, Syringa, Pride of China, White cedar, Bessieboom, Sering (in India, Neem bark or Margosa bark), has been used in other countries as a cathartic, emetic, and anthelmintic.[2, 3] In India the leaf, in the form of a decoction or of a poultice, is largely used to stimulate foul and indolent ulcers, a decoction for skin diseases, and a cold poultice of the bruised leaf for weeping eczema.[4] The plant is said to be narcotic in large doses,[2] but this has been denied by Wood [2] who, with preparations made from the dried bark and fruit, was unable to poison frogs and rabbits. In Lourenço Marques a native became extremely ill from drinking a decoction of the leaf, the symptoms being marked stomatitis, great reduction in the flow of urine, and violent sanguineous vomiting. Juritz[5] records the occurrence in South Africa of a fatal case of human poisoning by the berries, but subsequent animal experiments proved negative. Lander [6] mentions that in Arizona (U.S.A.) hogs have been poisoned by feeding the seeds to them, the symptoms being " nausea, vomition, violent colic, and tympanites, followed by diarrhoea, sweating, convulsions, uncertain gait, and intense thirst. The *lesions* are those of intestinal inflammation." Poisoning in pigs from eating the fruit has been recorded from New South Wales,[7] the animals soon after the ingestion becoming very ill, unable to stand or move, with feebly beating heart, occasional spasmodic shudderings, and cold limbs. Feeding experiments by the Veterinary Research Laboratories at Onderstepoort proved negative,[8] until Steyn[9] found that the seeds produce gastro-enteritis in sheep and paralysis in pigs, rabbits, and guinea-pigs. Later work by Steyn [10] shows that pigs are most susceptible to poisoning by the berry, while goats are somewhat less susceptible than sheep. Muscovy ducks cannot be killed even by large doses, but fowls are easily poisoned. Dogs vomit after ingestion of the berry and do not develop systemic poisoning. The symptoms which are fully described for various animals by Steyn and Rindl [8] are excitement, accompanied by rapid heart action, followed by paralysis, extreme cardiac weakness, cyanosis, and great respiratory embarrassment. Death is by asphyxia. Animals which survive for some time develop a foetid diarrhoea. *Post mortem*, there is cyanosis, and signs of irritation of the gastro-intestinal tract. The symptoms and *post-mortem* findings are the same when an alcoholic extract of the fruit is injected subcutaneously. According to Steyn and Rindl [8] the bark and young flowers are less toxic than the berries, and the fresh leaves are harmless.

The toxic principle or principles, which are probably *neutral principles*, are easily extracted from the fruit by 96 per cent. alcohol, but the product is contaminated by the presence of much resin. A purer product is obtainable by percolation with chloroform preceded by hot percolation with ether.[8]

The fruit has a peculiar unpleasant odour and an intensely bitter and nauseating taste, which make it unattractive to animals as a rule.[8]

Oil of Azedarach, which is extracted from the seed, is known as *margosa oil*, *neem oil*, *veepa oil*, and *veppam fat*, and is used in the East both medicinally and for burning.[2] According to Ghosh [4] it is " a valuable local stimulant,

antiseptic, and bactericide," and alone or in combination with chaulmoogra oil is used in the treatment of leprosy. He states that it contains *margosic acid*, a mixture of fatty acids, and that the acid and the margosates of sodium and potassium are said to be more effective in leprosy than the oil. Roy and Dutt [18] extracted 44·3 per cent. of oil from the kernels, the composition being lower fatty acids (including butyric and valeric acids) 2·31 per cent., stearic acid 21·38 per cent., palmitic acid 12·62 per cent., oleic acid 52·08 per cent., linoleic acid 2·12 per cent., arachidic and lignoceric acids 0·74 per cent., and unsaturated resinous acids 2·76 per cent.

The bark is a " bitter tonic, astringent, and anti-periodic," and was used in India for the treatment of malaria before the introduction of quinine.[4] There has been isolated from it a bitter substance, which is either a neutral principle [3] or an alkaloid (Cornish).[2, 3] Cornish [3] named it *margosin* and Piddington [3] *azadarin*. Broughton,[2] on the other hand, isolated a bitter, amorphous resin and a crystalline principle melting at 175° C. Juritz [11] found from 18·26 to 26·04 of *tannin* in the bark. The root-bark is said to be anthelmintic.[4]

The bark of **Ekebergia capensis Sparrm.,** Dog plum, Cape ash, Essehout (Cape Province), Esseboom, Zulu *uManaye*, *umNyamathi*, is used as an emetic by the Zulus. It contains 7·23 per cent. of *tannin*.[11] The bark of **Ekebergia meyeri Presl.,** Wild syringa, Mountain ash, Dog plum, Essehout (Transvaal), Zulu *umNyamathi*, Suto *mmaba*, is used as an emetic and enema by Zulus, who are disliked by their fellows, in order to re-establish better relationships. The Zulus also use an infusion of the leaf as an anthelmintic, and a decoction of the bark or root for heartburn (Bryant). The Sutos take a decoction of the root by the mouth for the relief of headache (Beyer). The bark is also used for tanning and as a native dysentery remedy, though it is stated to be poisonous.

In the Transvaal the bark of **Ekebergia sp.** is said to be poisonous, but is used in small doses by natives as an emetic.

Trichilia emetica Vahl., Cape mahogany, Natal mahogany, Christmas bells (Natal), Rooi-essehout, Maba, Mawa, Maawa, Marwa, Marba, Gnanda, Mafoureira, Mafeura bean, Zulu *umKhuhlwa*, *umKhuhla*, *iXolo*, Ronga *nkuhlu*, is used medicinally, and is also said to be poisonous. The Zulus use an infusion of the bark or leaf as an enema for sore back, for hot pains in the back, and for rectal ulceration in children. The enema is purgative. The Zulus and Xosas use a watery preparation of the bark as an enema for dysentery. The Rongas use the bark as a purgative enema, which produces sweating and vomiting, the oil from the seed in rheumatism, a hot infusion of the leaf as a lotion for bruises, and the leaf in their bedding as a soporific. Miss E. Dora Earthy states that the women in Gazaland prepare a cosmetic oil from the seed kernel, an edible oil from the white pulp surrounding the kernel, and candles from the kernel remains. They also use the oil as the basis of a leprosy remedy, the active ingredient of which is **Cyathula spathulifolia Lopr.** The treatment includes the taking of a decoction of the leaf of **Bridelia schlechteri.**

Bryant says that the plant is poisonous. The oil appears to be valuable for industrial purposes. The " cake " is poor for feeding and fertilising

purposes,[12] while Marchand [13] states it is toxic to stock. This opinion is supported by Hyman,[12] who records that "cake made from the whole seed is extremely toxic, but that natives eat the decorticated seed."

Because of the supposed toxic nature of the plant, Jamieson [14] undertook an investigation of it. He found that a decoction of the bark is non-toxic, and extracted 32 per cent. of a solid fat from the seed, which is also non-toxic. He isolated a *resin* and 6·8 per cent. of *tannin* from the bark. He thinks it is purgative on account of the resin. The constants of the oil and fat are given by Daniel and M'Crae.[15]

The seed oil of **Trichilia dregei E. Mey.,** Thunder tree (Natal), is used for cosmetic purposes by natives and also in cooking.[12] The plant appears to be toxic, and is said to have caused death in human beings,[11, 16] in one case by the use of a decoction as an enema.[16] Juritz isolated slender, needle-shaped, probably glucosidal, crystals from the plant.[17]

The Zulus rub the powdered fruit and bark of a **Trichilia sp.,** Zulu *umVongoti*, into incisions on the breasts of women secreting too much milk.

REFERENCES

1. M. Rindl: Private communication to J. M. Watt.
2. United States Dispensatory, 1926, 21st Edition, 1215.
3. A. Tschirch: Handbuch der Pharmakognosie, 1926, iii (2), 796.
4. B. N. Ghosh: Materia Medica and Therapeutics, 1930, 12th Edition, 641.
5. C. F. Juritz: (1) Rpt. of the Chief Chemist (Cape Province) for the Year 1910, U.G. 16—1912, 32; (2) So. Afr. J. Sci., 1914, xi, 124.
6. G. D. Lander: Veterinary Toxicology, 1926, 2nd Edition, 203.
7. Agr. Gazz., New South Wales, 1893, iv, 853; 1896, 427, 564; 1897.
8. D. G. Steyn and M. Rindl: Trans. Roy. Soc. So. Afr., 1929, xvii, 295.
9. D. G. Steyn: Quoted by H. H. Curson in J. So. Afr. Vet. Med. Ass., 1927, i (1), 46.
10. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 796.
11. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228, 231.
12. C. F. Juritz: Chem. News, 1923, clxxvi, 67.
13. B. de C. Marchand: So. Afr. J. Indust., 1917-18, i, 1025.
14. J. S. Jamieson: So. Afr. J. Sci., 1916, xiii, 496.
15. W. R. Daniel and J. M'Crae: Analyst, 1908, xxxiii, 276.
16. C. F. Juritz: Trans. So. Afr. Phil. Soc., 1905-07, xvi, 117.
17. C. F. Juritz: So. Afr. J. Sci., 1911, viii, 98.
18. A. C. Roy and S. Dutt: J. Soc. Chem. Ind., 1929, xlviii, 333T, through Qtly. J. Pharm. and Pharmacol., 1929, ii, 618.

LVIII. MALPIGHIACEAE

Sphendamnocarpus pruriens Planch., Malpighian hair, Chopi *pupuma*, has intensely irritating hairs on the fruit. Medley Wood states that the plant is used medicinally by the Zulus. The Chopis use the plant along with **Securidaca longipedunculata Fresn.** as a medicine for people "possessed" of evil spirits.

The Tongas and Shangaans use the powdered root of **Acridocarpus natalensis Juss.,** Shangaan *mabophe*, Chopi *mabote*, Hlengui or Hlengwe *nyameluru*, as a purgative in colic and constipation, and as an ointment in treating pemphigus. In Moçambique the natives employ the plant as a "war" medicine, and in the purification rites after a death (de Almeida).

LIX. POLYGALACEAE

The Manganjas of Nyasaland apply to the skin in smallpox a poultice of the crushed leaf of **Polygala arenaria Willd.,** Manganja *nsonka, nsonka mpwache.*

The root of **Polygala tenuifolia Link.** is a native indigestion remedy. A senega, variously supposed to be derived from **Polygala japonica** or **Polygala tenuifolia,** contains 0·8 per cent. of *resin*, a trace of *methyl salicylate*, and 8·8 per cent. of an *oil* with a *patchouli* odour.[1] The root of Polygala tenuifolia ex Japan contains 0·65 per cent. of a saponin *senegin*, and no salicylic acid.[2]

The Zulus use the powdered root of **Polygala serpentaria E. and Z.,** Kafferslangwortel, as a purgative in children. It is given in milk as an enema, and is stated to be mild and slow in action. On the other hand, if the main stem is used, or if too much of the root is given, the action may be so severe as to cause death. In former times it was a native snake-bite remedy (Pappe).

A decoction of the root of **Polygala oppositifolia L.,** Zulu *iThethe*, is a Zulu remedy for dropsy. Bryant states that the plant is bitter, and that the root decoction enters into a Zulu remedy for tuberculosis. He mentions also that the Zulus use a **Polygala sp.,** Zulu *iThethe*, apparently not Polygala oppositifolia, as a medicine for tuberculosis.

An infusion of the root of **Polygala hottentotta Presl.,** Suto *lenano, lehlokwa-la-tsela*, is administered by the Sutos to children suffering from mumps, and the root is a Suto anthrax remedy. The leaf of **Polygala myrtifolia L.,** Langelier, Langeleden, Septemberbossie, is used by Europeans as a poultice in gout.

Securidaca longipedunculata Fresn., Fibre tree, Wild wisteria, Wilde-wisteria, Kololo and Rotse *mwinda*, Lovale *lunda, mutata*, Lamba and Lenji *ulupapi*, Chuana *maba*, Port. East Afr. *pupuma, mudla-ndlopfu, giladi*, is widely used as a medicine. The Sutos take a decoction of the root for cough and chew the root for the relief of toothache. The Chuanas use the root decoction for all chest complaints—the preparation being said to produce sweating. The Rotses pound the root in hot water and apply the mixture as a poultice in rheumatism. They also use the steam from the cooking roots as a steam bath in colds. We are informed that at Lealui a Rotse woman died after inserting the crushed roots into the vagina. Death may have resulted from causes other than the toxicity of the root. Our informant in this case distilled an *oil* from the root which, on analysis, was found to consist of 99·5 per cent. *of methyl salicylate*. The Lambas use the powdered leaf and bark as a local application to wounds and sores. They tie strips of bark around the leg in rheumatism, and for headache insert the powdered root into incisions on the forehead. A strip of the inner bark is tied tightly round the chest in diseases of that part.

Various tribes in Barotseland use a cold infusion of the wood as a general remedy for almost any illness. Scrapings from the wood are rubbed into incisions on the forehead to relieve headache. It is generally held among the Rotses that the insertion of the contused wood of the plant into the vagina will cause death. In West Africa the plant is sometimes an ingredient of arrow-poison. In Zambesi the bark of the root is used as a soap, and the leaf as a

snake-bite remedy. At Nuanetsi the natives take the root for fevers. In South-West Africa an infusion of the bark is used by the natives in treating syphilis. In Portuguese East Africa a cold-water infusion of the powdered root is drunk by persons who are believed to be possessed of an evil spirit, and is taken, together with an infusion of a plant which is probably **Heeria abyssinica,** as a purifying medicine after ceremonial defilement. The infusion causes vomiting and diarrhoea. The root contains 0·1 per cent. of *methyl salicylate* and 4 per cent. of *saponins.*[3] Lenz [4] found 1·342 per cent. of *acid saponin* and 0·940 per cent. of *neutral saponin* in the root-bark. Fabrègue [5] isolated *securidaca-saponin* from the stem-bark, the sapogenin being insoluble in water but very soluble in ether. According to Pammel the plant is poisonous. We find that a cold infusion produces irritation of gastro-intestinal tract in cats which may be fatal.

According to Phillips, **Polygala amatymbica E. and Z.,** Suto *mohlohlêllo, molelabeho-o-monyenyane,* is stimulant, and is used by the Sutos as a cattle medicine.

Pappe states that a decoction of the tops of the branches of **Mundia spinosa DC.,** Skilpadbessie, Bokbessie, Duinebessie, was formerly used in atrophy, phthisis, and other conditions. The fruit, though astringent, is eaten by children.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1434.
2. A. Tschirch: Handbuch der Pharmakognosie, 1917, ii (2), 1534.
3. Bull. Imp. Inst., 1915, xiii, 50.
4. W. Lenz: Arb. a. d. Pharm. Inst. d. Univ. Berlin, 1913, x, 177, through Arch. Pharm., 1927, cclxv, 58.
5. —. Fabrèguo: Bull. Sci. Pharmacol., 1923, xxx, 16, through Chem. Abs., 1923, 17, 2167.

LX. DICHAPETALACEAE

The leaf of **Dichapetalum cymosum (Hook) Engl.** (Chailletia cymosa Hook), Poison leaf, Gifblaar, Gifblad, Maakgou, Makou, Makaon, Suto *moyao* (?), is very poisonous to stock and causes annually great loss to farmers.[1, 2, 3, 4] The plant seems to cause most loss in the spring before grass has grown, and when it is one of the few green plants available [1] (*cf.* Urginea burkei). This fact may be connected with the observation that young leaves are most toxic and old leaves scarcely toxic at all.[4] In addition, all other parts of the plant show some degree of toxicity.[4] Steyn [4] and Mogg [9] have found that there are two periods of marked toxicity, both of which coincide with the throwing out of fresh leaves. Under natural conditions, only cattle, donkeys, sheep, and goats eat the plant, but it has been proved experimentally to be toxic to other domesticated animals.[4] The plant is comparatively tasteless and odourless, and so stock habituated to Gifblaar veld still eat it.

The symptoms, which are similar in cattle, sheep, and goats, have been described by Dunphy [5] and Steyn.[4] They are as follows: the animal stops feeding and rumination and becomes very uneasy, constantly getting up and lying down. Symptoms come on in a few hours but are delayed in their onset by withholding water from the animal. When walking, it is unsteady on its

legs, staggers, and lifts the feet abnormally high. The heart is accelerated, and the pulse soft and often imperceptible. The respiration is quick and shallow. There is hyperaesthesia, quivering of the muscles, and exaggerated reflexes. Vision is impaired. Salivation is present, and there is diuresis and marked frequency of micturition. Diarrhoea is seldom seen. In from six hours to two or three days after the commencement of symptoms the animal becomes comatose and death supervenes. Cases which recover may show anorexia, sluggish intestinal activity, staggering gait, disinclination to move, rapid loss of condition, and thirst. These symptoms commence within eight days of ingestion of the plant, and may last as long as a week.[4]

Post mortem, the striking features are serous effusion into the sacs, subepicardial and subendocardial haemorrhages, hyperaemia and oedema of the lungs, hyperaemia, and sometimes degenerative changes in the liver, kidneys, and myocardium, and catarrhal gastro-enteritis. In cattle, the gastro-enteritis may occasionally be haemorrhagic, and in dogs this symptom seems to be the most marked one.[4]

The poisonous properties of the plant were at one time thought to be due to the presence of a cyanogenetic glucoside,[2, 6] indeed the Imperial Institute isolated *hydrocyanic acid* from the leaf, the percentage being, according to Marloth,[3] 0·0014. Later, however, working with material of varying degrees of maturity, the Imperial Institute [7] was unable to find either glucosides (including cyanogenetic glucoside) or alkaloids, but isolated two *resins*, one easily soluble, the other soluble with difficulty in alcohol. These are both toxic. Green,[4] on the other hand, isolated a clear, pale yellow thermostabile, syrupy substance, soluble in water and aqueous alcohol but insoluble in absolute alcohol. A rabbit which received 0·1 grm. per kilo subcutaneously of this principle died in half an hour. Green found that all parts of the plant, including the fruit, are toxic. Stephen [10] has isolated from the leaf phytosterols, organic acids, *tannins*, three *resins*, and a *toxic principle* which was obtained in two forms, a *yellow syrup* and a *brown powder*. The resins are without action. The yellow syrup, given to a cat by the mouth, produced death, with symptoms of gastro-intestinal irritation and convulsions. The brown powder given to a rabbit subcutaneously resulted in death without apparent symptoms. Both the yellow syrup and the brown powder, injected subcutaneously into frogs (*Xenopis*), produced death, with a peculiar yellow coloration of the skin.

Dichapetalum venenatum Engl. and Gilg., Blaargif, Makou (Ovamboland and Damaraland), contains a *cyanogenetic glucoside*.[3] Marloth,[8] elsewhere, states that the effects are similar to those of Dichapetalum cymosum, and that the fruit is edible.

REFERENCES

1. J. Burtt-Davy: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, iii, 537.
2. L. H. Walsh: South African Poisonous Plants, 1909, 50.
3 R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 6, 10, 11.
4 D. G. Steyn: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 187.
5. J. T. Dunphy: Transvaal Agr. J., 1906, iv, 315.
6. Bull. Imp. Inst., 1903, i, 14.
7. Bull. Imp. Inst., 1916, xiv, 32.
8. R. Marloth: The Flora of South Africa, 1925, ii (1), 120.
9 A. O. D. Mogg: So. Afrriva J. Sci., 1930, xxvii, 368.
10. Florence V. Stephen: Private Communication.

LXI. EUPHORBIACEAE

The powdered root-bark of **Andrachne ovalis Mull. Arg.,** Zulu *umBeza*, mixed with milk is used as a fly exterminator by the Zulus. Flies are said to die rapidly after drinking the milk. The Zulus also wash the head with an infusion of the root to disinfest it, and use the plant as a snake-bite remedy. A decoction of the root is administered by the Swazis as an anthelmintic in man and animal.

The Marozis and neighbouring tribes use **Pseudolachnostylis sp.,** *probably* **Pseudolachnostylis maprounaefolia Pax.,** Kololo *mukungu*, Wiko *mukunyambambe*, in the treatment of pneumonia, by inhaling the smoke from burning the root and taking a preparation of the root internally. The treatment is said to produce sweating, which may, however, be due to the method of application.

The Rongas and Europeans use the powdered leaf of **Phyllanthus reticulatus Poir.,** Ronga *tetenya*, as a local application to sores, burns, and suppurations, and chafing of the skin. The Rongas also apply it to venereal sores.

The root-bark of **Phyllanthus engleri Pax.,** Ila *muFweba-bachazi*, *muLia-balishina*, *muLia-walishina*, is used in Northern Rhodesia, especially by the Ilas, as a suicidal agent. The bark is placed in a pipe with hot ashes on top. One long inhalation is said to produce instantaneous death. Natives maintain that if the bark is smoked slowly, inhaling only a little of the smoke, the result is not fatal. Indeed, such slow smoking is said to be used medicinally, but we do not know for what it is used. A cold infusion of the root-bark, made into a gruel with meal, is used by the Ilas as a cough remedy. They also chew the leaf as a tonic for indigestion and constipation. They think that the root-bark may be taken by the mouth with impunity, and that extracts of it are also non-toxic by the mouth. The fruit and bark of the above-ground parts of the tree are said to be non-toxic, and the former is used by the Ilas as a toothbrush.

Experiments do not confirm the Ila ideas of the toxicity of the tree.[1] The fumes and smoke from burning the root-bark are non-toxic on inhalation by the guinea-pig and the rat. The root-bark is negative to tests for tannin and for free hydrocyanic acid or cyanogenetic glucosides. A dry alcoholic extract made with 70 per cent. alcohol is highly toxic to rabbits, the minimum lethal doses being : intravenously, 0·00032 grm. per kilo (death in 1½ minutes) ; subcutaneously, 0·0009 grm. per kilo (death in about 50 hours); orally, 0·070 grm. per kilo (death in about 40 hours). Intravenous injection of this extract produces immediate collapse and rapid stoppage of the heart and respiration. After subcutaneous or oral administration, the animal shows little effect to begin with, but later, slowing and irregularity of the heart, and convulsions. The active principle has not yet been isolated, but the above results are suggestive of the presence of a toxalbumin, though they do not exclude the possibility of an alkaloid.

The Zulus use the leaf of **Antidesma venosum E. Mey.,** Zulu *isiBanga-*

mlotha, Tonga *shonga*, as one of the ingredients of an infusion for abdominal complaints (Bryant). Medley Wood states that the berry is poisonous.

The seed of **Hyaenanche globosa Lamb** (Toxicodendron capense Thunb.; Hyaenanche capensis Pers.), Hyena poison, Boesmansgif, Gifboom, Wolwegif, Wolweboontjie, is commonly used for treating carcasses to kill hyenas, jackals, and like vermin. It has also been used as an ingredient in Bushman arrow-poisons. Mountains near van Rhynsdorp are known as the Gifbergen on account of the prevalence of the plant. Henkel [2] first isolated a toxic principle from the seed and the seed-coat, which was later isolated in a crystalline state by von Engelhardt.[3] This was named *hyaenanchin*, $C_{15}H_{18}O_7$, and is neither an alkaloid nor a glucoside. It resembles strychnine in its action, but has a more powerful effect on the cerebrum.[3] Strychnine stimulates the central nervous system, especially the spinal cord, and is a convulsant poison. Marloth [4] states that Schuchardt of Görlitz found the toxic principle to be an alkaloid, but this statement is not confirmed by other work. Marloth [5] quotes Peckoldt [6] as isolating a bitter toxic principle, but on reading through the Peckoldt reference we find no mention of the plant.

Henry [7] isolated from the fruit 0·19 per cent. of a toxic crystalline principle. The leaf and stem contain traces only of this substance. He split it into two crystalline isomeric bodies, *hyaenanchin* and *isohyaenanchin*. These have the same formula as von Engelhardt's hyaenanchin, and Henry's hyaenanchin is identical with it. Hyaenanchin decomposes at 234° C., is soluble in water and several organic solvents, contains no nitrogen, reduces Fehling's solution, and is probably a dilactone. Isohyaenanchin decomposes at 299° C., is soluble in water and several organic solvents, and reduces Fehling's solution. Hyaenanchin has an action almost identical with picrotoxin; isohyaenanchin is non-toxic in doses which are possible intravenously. Both are isomeric with picrotin (picrotin is associated with picrotoxin in the molecule), and in many ways picrotin is similar to isohyaenanchin, but not identical. Henry also isolated some *tannin* and a dark green *wax* from the leaf and stem, the wax containing an alcohol, a phytosterol, and a yellow colouring matter.

The bark of **Croton gubouga S. Moore,** Transvaal croton bark, is used by natives in the Transvaal and Portuguese East Africa, and was at one time popular among Europeans as a malaria remedy. For this purpose the powdered bark is made into pills. It is said to produce benefit. In Gazaland the bark is used as a fish poison (Flora capensis). Goodson and Clewer [8] isolated from it a crystalline proline derivative *4-hydroxyhygric acid*, $C_6H_{11}O_3N \cdot H_2O$. This appears to be an irritant, and to cause numbness on tasting, though these results were obtained with an impure principle.[9]

Croton gratissimus Burch., Bergboegoe, Zulu *uMahlab'-ekufeni*, Pedi *bori*, Kxatla *molôxa*, is used as a remedy for fevers. The Transvaal Sutos treat bleeding gums by brushing them with the charred and powdered bark (Watt and van Warmelo). Bryant says that the plant is very toxic, and that the Zulus use it as a cathartic and as an eruptive irritant. The bark is applied for its irritant action to the chest wall in painful respiratory conditions, intercostal neuralgia, etc. The Zulus also used the powdered bark as one of the ingredients of a remedy inserted into the uterus for disorders of that organ.

The leaf is used among other ingredients by the Transvaal Sutos for smoking rheumatic patients. The Kxatlas make an eye lotion for animals from a cold infusion of the leaf and use the root as a charm medicine (Schapera). There seems some doubt about its toxicity, for in South-West Africa the plant is held to be a valuable food-stuff for stock.[10] Marloth [11] states that the leaves and stems yield an aromatic oil.

The powdered bark of **Croton sylvaticus Hochst.**, Zulu *umZila-nyoni*, *uMahlab'-ekufeni*, is a Swazi remedy for gall-sickness in cattle. Bryant states that the plant is toxic, and that the Zulus use it in the same way as Croton gratissimus. The bark is used in Gazaland as a fish poison.

The Transvaal Shangaans use the nut of a **Croton sp.**, Shongo strong bean, as a fish poison. The ground-up material is mixed with porridge and placed in the water. The fish are alleged to float to the surface paralysed. The bark and root of a **Croton sp.** are used as a purgative in Sekukuniland.

The Zulus use an infusion of the root of **Acalypha peduncularis Meissn.**, Zulu *uSununundu*, as an expectorant (Bryant). The preparation is apparently emetic. They also use an infusion of the decorticated root of **Acalypha punctata Meissn.**, Zulu *uSununundu*, as an emetic in chest complaints. Eighty grams of the dried plant given to a sheep produced no symptoms.[31] In the Filabusi district of Southern Rhodesia the natives use **Acalypha sp.**, *prob.* **Acalypha petiolaris Hochst.**, in the treatment of wounds.

The Zulus drink a decoction of the root of **Tragia meyeriana Mull. Arg.**, Zulu *umBabazane*, for pains in the bladder region. The preparation must be taken in the evening only. The Shangaans of Portuguese East Africa use a cold infusion of **Tragia sp.** as one of the ingredients in an antisyphilitic remedy.

An infusion of the leaf of **Ricinus communis L.** (Ricinus lividus Jacq.), Castor-oil plant, Castor bean, Palma Christi, Kasteroliebom, Zulu *umHlakuva*, Xosa *umHlavuthwa*, Pedi and Suto *mokhura*, is a Zulu remedy for stomach-ache. It is administered orally or as an enema. The powdered seed is placed on the tongues of calves which refuse to suck, the result being purgation. The Zulus also apply a paste of the root in toothache (Bryant). In Southern Rhodesia the bark is used by natives for stitching up wounds, and as a dressing for wounds and sores (Dornan). The Chewas boil the root in water which has been previously boiled with the ashes of maize stalks. The sediment from the second boiling is smeared on the teeth and gums to relieve toothache, the material not being swallowed. The Transvaal Sutos apply the powdered roasted seeds to sores, boils, etc., in children (Watt and van Warmelo). The leaf has been applied to the head to relieve headache (Thunberg), and is commonly used as a poultice for boils. The local application of the leaf to the mammae is said to produce a powerful galactogogic action.[12, 13] Burtt-Davy [12] mentions that the foliage is emmenagogue, the root-bark purgative, and the leaf useful as a local application in rheumatism.

The seed of the plant is the source of castor oil, of which it yields about 50 per cent. The entire seed is a very active poison on account of the presence of a toxalbumin, *ricin*. This principle, which is not present in castor oil, is non-poisonous by the mouth. On subcutaneous injection it is highly toxic,

producing, after a latent period (often several days) with no symptoms, loss of appetite, diarrhoea, and vomiting. *Post mortem*, gastro-enteritis and haemorrhagic effusions into cavities and organs are found. Ricin is said to depress the medullary centres, particularly the vasomotor and respiratory centres. An alkaloid, *ricinine*, has also been isolated from the seed, but appears to be non-toxic.[14]

The seed of **Jatropha curcas L.** (Curcas purgans Endl.), Physic nut tree, Purging nut tree, *Seeds*, Cuban physic nut, Black-vomit nut, Big-purge nut, Barbados nut, Semen ricini majoris, has produced poisoning in children in South Africa,[15] and is used by Indians in Natal as a purgative. Poisoning by the seed has also been recorded in England (Kobert). The poisoning is irritant in type. Three to five of the seeds slightly roasted and deprived of their envelopes is an active purgative dose.[14] The seed contains from 29 to 40 per cent. of a yellow fixed oil (sp. gr. 0·929),[32] known variously as *Hell oil*, *Pinhoen oil*, *Oleum infernale*, and *Oleum ricini majoris*. It consists of the glyceride of a characteristic acid, belonging to the same group as ricinoleic and crotonoleic acids, but is not identical with either. The activity is greater than that of castor oil and less than that of croton oil. The purgative dose is 0·3 to 0·6 c.c. The oil is much used in commerce for illuminating purposes, soap-making, adulteration of olive oil and the making of Turkey red oil. It is used as a lubricant on account of its low acidity. The Bantu use it to anoint the skin. In addition to the oil, the seed contains *curcin*, a toxalbumin which, besides being highly irritant, produces deleterious effects on the blood. These latter have not been clearly elucidated. Curcin resembles crotin (*q.v.*). Pammel states that the plant is used as a fish poison, and Kobert, that all parts contain an irritating and acrid latex. The juice gives a *kino* which is astringent.[14] The bark yields a *wax* which is a mixture of *melissyl alcohol* and its *melissinic acid ester*.[16]

The Zulus use a decoction of the root of **Jatropha zeyheri Sond.**, Zulu *uGogide*, as a "blood purifier." According to Bryant, they also apply the powdered root of **Jatropha hirsuta Hoch.**, Zulu *uGogide*, as a dressing for fresh wounds. The sap of **Jatropha capensis Sond.** has been used as an internal remedy for tuberculosis of the lungs and other respiratory conditions (Flora capensis). It is also applied to ringworm.

The root of **Manihot aipi Pohl.**, Cassava, Sweet cassava, Tapioca, Broodboom, is used as a food by the Bantu, but they advise removing the core, especially of young roots, because gastric disturbance and headache may follow its ingestion. On the other hand, the United States Dispensatory [14] states that the root may be eaten with impunity, but that the fresh root of bitter cassava (**Manihot utilissima Pohl.**) is highly poisonous from the presence of an acrid latex. It has been stated that the toxic effects of bitter cassava are due to *hydrocyanic acid* or to *manihotoxine*.[14]

In Northern Rhodesia the bark of **Cluytia pulchella L.**, Lightning shrub, Zulu *uNgwaleni*, Suto *mohlatswa-mafi*, Xosa *umFiyo*, Ila *muFweba-bachasi*, is suspected of being poisonous, and we have a report in which it is stated that a dead native was found with the bark beside him, under circumstances pointing to suicide. The Zulus use a milk infusion of the leaf, stem, and root

for griping pains in children (enema) and for similar symptoms in calves (drench). Bryant states that they use a hot infusion of the leaf for stomach-ache, and as a dysentery and diarrhoea remedy, and rub the powdered herb into incisions over fractures and sprains to hasten healing. The plant is used by the Xosas to ward off lightning and by the Sutos as a fuel.

Natives use a decoction of the leaf and stalk of **Cluytia heterophylla Willd.**, Xosa *ubuHlungu-bedila*, with **Aloe sp.** and sneezewood (**Ptaeroxylon utile E. and Z.**) as a remedy for anthrax in cattle.

The leaf of **Cluytia hirsuta Mull. Arg.**, Xosa *ubuHlungu-bedila*, is used by the Xosas in making an infusion with **Blepharis capensis** and **Monsonia ovata**, which is taken internally for anthrax. A paste of these three plants is also applied round the pustule. This treatment for anthrax is used by Europeans, and has been adopted by a hospital, which strongly recommends it. A 1 in 8 tincture of the leaf is given several times a day in 20-minim doses, along with tincture of Monsonia ovata and tincture of Blepharis capensis. We doubt its efficacy. The Xosas use the plant as a tonic, and boil anthrax-infected meat with the leaf to disinfect it (Smith). For gall-sickness in stock they administer an infusion of the leaf of Cluytia hirsuta and Leonotis ovata. Smith states that the plant contains a quinine-like substance and a volatile oil, but no experimental confirmation has been forthcoming.

Cluytia similis Mull. Arg. is used as an anthrax and snake-bite remedy. The above-ground part of the plant has been analysed.[17] An alcoholic extract contains no alkaloid, but yields a small amount of a *volatile oil* with a strong, rank odour, *chrysophanol*, various organic acids including, apparently, a trace of *salicylic acid*, a large amount of a sugar, and a dark green *resin*, consisting of various alcohols, esters, and phytosterolins. It also contains some inorganic matter. None of these constituents is likely to be active except the volatile oil, which may be mildly antiseptic and carminative.

The Transvaal Zulus and the Swazis drink the powdered root-bark of **Cluytia platyphylla Pax. and Hoffm.**, Zulu *iNgwaleni*, *umLuma*, in water for abdominal troubles generally. The preparation is said to have no purgative action.

The Sutos take a milk infusion of the leaf of **Cluytia natalensis Bernh.**, Suto *mosadi-mofubedu*, for indigestion.

According to Smith, the Xosas use a **Cluytia sp.** as a glanders remedy. The Zulus and Xosas take minute doses of the root of **Cluytia sp.**, Zulu *umBeza*, as a remedy for snake-bite. The powder is also rubbed into the punctures. The root is thought to be highly toxic, and overdosage results in a burning sensation in the epigastrium, and vomiting. The Fingos apply a paste of the leaf of **Cluytia sp.**, Fingo *umBethe*, to white marks which develop on the skin after a particular rheumatism treatment. The marks disappear temporarily. They also use the leaf as a purgative in horses, and sometimes take the root as a substitute for willow root in rheumatism.

The Rongas use an infusion of the stem- or root-bark of **Spirostachys africanus Sond.** (Excoecaria africana Muell. Arg.), Tambootie, Ronga *shilati*, Tonga *umTomboti*, Suto *morekuri* (?), as a purgative in constipation and kidney disease. The Tongas use the powdered bark itself, in a very small dose,

as a purgative, and the Sutos take a decoction of the bark as an emetic (Beyer). Stevenson-Hamilton states that the tree is highly poisonous, the sap being acrid, and causing serious inflammation if applied to the eye or to skin abrasions. A decoction of a **Spirostachys sp.** is an ingredient of a Ronga leprosy remedy.

The latex of **Euphorbia ingens E. Mey.,** Candelabra-euphorbia, Kankerbos (Rustenburg), Zulu *umHlondlo*, is said to be highly toxic, producing blistering and irritation of the skin. None the less, it is used in very small doses by the Zulus as a drastic purgative. This use is said to cause, not infrequently, death from overdosage. The Sutos administer the latex for the cure of dipsomania and use the plant as a cancer remedy.

The Sutos use the powdered root of **Euphorbia striata Thunb.,** Spurge, Milkweed, Melkgras, Suto *mohlatsisa*, *matswane*, as an emetic in stomach disorders. Phillips states that the Sutos put the plant into sour milk to give it a pleasant taste. The natives of Rhodesia are said to use among their arrow poisons a **Euphorbia sp.,** *prob.* **Euphorbia striata** (Dornan). The plant has been fed to young sheep without deleterious effects.[18]

Euphorbia inaequilatera Sond., Lamba *iciMamba*, dried and powdered, is used by the Sutos as a dusting powder for infants. The root is a Lamba fish poison, while they eat the flower as a relish and the green pods as a vegetable. They also tie strips of the inner root-bark round the loins of infants to relieve constipation.

The Xosas, Fingos, Pondos, and Bacas use the latex of **Euphorbia pugniformis Boiss.,** Slanggif, Xosa *inTsema*, *inKamamasane*, as an application to all sorts of sores, eruptions, and cancers on the skin. In deep-seated ulceration of the skin, a slice of the plant is applied as a plaster. A drop of the latex is placed in aching teeth to relieve the pain. The latex is stated to be a violent emetic and purgative (Smith), and is used by natives for these actions in dyspepsia and constipation (Hewat). The latex appears undoubtedly to be highly irritant. A case of death from drinking a decoction of the plant is on record.[19] Hahn isolated a yellow, resinous substance, *euphorbin*, which is a powerful vesicant.[19]

In the Eastern Transvaal, natives apply the latex of **Euphorbia sp.,** *prob. near* **Euphorbia clavaroides Boiss.,** Vingerpol, to cancerous sores and to warts.

Thunberg states that the juice of **Euphorbia genistoides Berg.,** Piss grass, Pisgoed, Pisgras, produces strangury in horses and cattle, and Walsh, that poisoning results in a severe urethritis which produces strangury. Crowhurst [20] described experimental "pisgoed" poisoning, but unfortunately omitted to mention the names of the plants used. Steyn [29] has shown that the disease in sheep is an infective urethritis. The plant is non-toxic to sheep.[35]

The Cape farmers in older times were of the opinion that **Euphorbia tuberosa L.** was toxic to oxen when eaten, causing strangury. The latex is acrid (Burchell).

The latex of **Euphorbia virosa Willd.,** Noorsdoring, was formerly used by the Namaqualand Bushmen as an arrow poison.[5] Marloth states it contains *euphorbin* [5] and is irritant.[11]

Euphorbia esculenta Marl., Vingerpol, a drought-resisting plant of the Karroo; must not be confused with **Euphorbia caput medusae,** also known as

Vingerpol. The former is a valuable fodder, the latter poisonous. **Euphorbia caput medusae L.,** Vingerpol, Hondebos, apparently owes its toxicity to a resin.[21] Armstrong [22] records that during a prolonged drought in the Cape Midlands, milch cows fed almost exclusively on this plant were unable to give birth to calves on account of the marked deformity of the latter, and many died during parturition. They showed tenderness and stiffness, particularly in the fore legs. Hutcheon [22] thought that the condition resulted from defective and irregular nourishment, and states that the plant has high value as a fodder. An analysis by Muller is given in detail.[22]

Burchell states that the inspissated juice of **Euphorbia mauritanica L.,** Geel melkbos, was used by the Bushmen in making arrow poison. There is no record of its being toxic, and it may be that it was used purely for its cohesive properties.

According to Wicht the latex of **Euphorbia helioscopia L.,** Spurge, Milkweed, Melkgras, Melkbos, Wolfsemelk, is successfully used for the removal of warts. He thinks the action is due to an irritant resin, *euphorbon* (*sic*). Smith [23] says that the toxic principle is *euphorbin*. Kobert states that the plant is toxic because the latex is highly irritant, when applied externally or taken internally. Robertson [30] records that the plant is toxic to stock, but Steyn [31] fed large amounts of the plant to a sheep without effect.

The latex of **Euphorbia candelabrum Tremant.,** Candelabra tree, Gifboom, has been used by the Bushmen in making poison arrows. Stow and Stevenson-Hamilton say it is poisonous. Schapera [24] states that the Namib Bushmen use it as solvent for other ingredients, though he quotes Trenk [25] as stating that the Namibs use it as the sole ingredient. Schapera also mentions that the Bushmen use the plant as a game poison by placing branches of the plant in drinking pools.

Euphorbia gregaria Marl. is a source of poor-quality rubber, some of the material exported from Natal showing moisture 27·9 per cent., and containing 11·2 parts *caoutchouc* and 51·5 parts *resin*.[5] The seed contains 40 per cent. of *oil*, and the stem 2·44 per cent. of a crude *wax-like substance*.[26]

Euphorbia tirucalli L., Tirucalli, and **Euphorbia dregeana E. Mey.** are also sources of low-grade rubber.[5, 33, 34] They also contain *resin*. Pammel states that the former is used as a fish poison and is irritant.

Euphorbia restituta N. E. Br., Klip-melkbos, is used by the Hottentots as a medicine to hasten tedious childbirth. It is said that if the treatment is continued for two or three days, it " helps and strengthens " (Laidler).

Marloth [5] states that **Euphorbia enopla Boiss.,** Norsdoring, Boknors, **Euphorbia cervicornis Boiss.,** Olifantsmelkbos, **Euphorbia inermis Mill.,** and **Euphorbia racemosa E. Mey.** are all harmless and valuable as stock food. Steyn [27] finds that **Euphorbia sp.,** *prob.* **Euphorbia muricata Thunb., Euphorbia pulvinata Marl.,** Pincushion, Voetangel, and **Euphorbia pubescens Vahl.** are non-toxic in feeding experiments, though the last named has been stated to cause constipation and narcosis when eaten by stock unaccustomed to it.

The Xosas use the latex of **Euphorbia bupleurifolia Jacq.,** Xosa *inTsema*, *inKamamasane*, as an application to cancerous sores, for cracked skin on the feet, and for various skin diseases.

Euphorbia basutica Marl., Suto *sehloko*, is used by the Sutos in making a lotion for bathing swollen feet (Phillips), and with **Berkheya (Stobaea onopordifolia DC.)** as a leprosy remedy. A Suto remedy for application to sore nipples in suckling mothers is made from **Euphorbia sanguinea Hochst. and Steud.,** Spurge (Pretoria District), Suto *selwe, kxama-maswana, tatampoi-e-nyenyane.*

According to Steyn,[27] **Euphorbia elliptica Thunb., Euphorbia rhombifolia Boiss.,** and **Euphorbia truncata N. E. Br.,** Kwena and Chuana *letšao-la-tau*, are suspected of being toxic to sheep and goats. The last named, burnt and powdered, is applied as an ointment to sores by the Kwenas and Chuanas. Marloth states that **Euphorbia hedienii Berger,** Suur-norsdoring, is poisonous, and that the root of **Euphorbia decussata E. Mey.,** Kierie moer, Siekkierie, is used in brewing native beer.

Natives in Southern Rhodesia apply **Euphorbia abyssinica J. F. Gmel.** (Euphorbia angularis Klotzsch.) to wounds and sores (Dornan), and they have also used it for homicidal purposes.[28] It has been regarded as poisonous, but Facer [28] finds that neither the latex nor a watery extract is toxic to guinea-pigs when given by the mouth.

The Sutos of the Eastern Transvaal apply the latex of **Synadenium arborescens Boiss.,** Transvaal Suto *moilanone*, Zulu *umDlebe, umBulele*, Swazi *umDletshana*, to painful hollow teeth. The plant is apparently highly dangerous, for the application of the latex to the eye causes considerable destruction, and its application to the mouth great swelling, and a rash followed by desquamation. Medley Wood and Bryant both state that it is very poisonous. The Swazis apply the plant externally as an embrocation, but never take it internally. The Zulus inhale the pungent vapour from a broken leaf to relieve headache (Bryant). The latex gives off a highly irritant vapour. The Sutos chew the dried leaf for asthma (Beyer).

The natives in Barotseland use **Synadenium grantii Hook.** as a remedy for leprosy (de Almeida).

REFERENCES

1. J. M. Watt and M. G. Breyer-Brandwijk : Bantu Studies, 1929, iii, 395.
2. —. Henkel : Arch. Pharm., 1858, 16, 114, through Kobert's Toxicology.
3. A. V. Engelhardt : Dorpat. Arb., 1892, 1, 8, through Kobert's Toxicology.
4. R. Marloth : Agr. J., Cape of Good Hope, June 1909.
5. R. Marloth : The Chemistry of South African Plants and Plant Products, 1913, 11, 18.
6. —. Peckoldt : Ber. pharm. Gesellsch., 1905, 15, 183, 225.
7. T. A. Henry : J. Chem. Soc., 1920, cxvii, 1619.
8. J. A. Goodson and H. W. B. Clewer : Trans. Chem. Soc., 1919, 115, 923.
9. H. S. Greenish : Pharm. J., 1918, 101, 289.
10. W. Heering u. C. Grimme : Arb. d. deutsch. Landw. Gesellsch., 1911, 194, through ref. No. 5.
11. R. Marloth : The Flora of South Africa, 1925, ii (2), 130, 132.
12. J. Burtt-Davy : Transvaal Agr. J., 1905, iii, 277.
13. B. N. Ghosh : Materia Medica and Therapeutics, 1930, 12th Edition, 162, 472.
14. United States Dispensatory, 1926, 21st Edition, 608, 778, 1217, 1452, 1498.
15. J. M. Watt and M. G. Brandwijk : J. Med. Ass. So. Afr., 1927, i, 370.
16. J. Sack : See Chem. Zent., 1906, i, 1106.
17. F. Tutin and H. W. B. Clewer : J. Chem. Soc. Trans., 1912, ci, 2221.
18. D. G. Steyn : J. So. Afr. Vet. Med. Ass., 1928, i (2), 50.
19. —. Hahn : Quoted by C. F. Juritz, So. Afr. J. Sci., 1914, xi, 124.
20. J. W. Crowhurst : Rpt. Colonial Vet. Surg. and Assist. Vet. Surgeons for the Year 1895, Cape of Good Hope, G. 41—1896, 67.
21. C. F. Juritz : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 226.

22. H. F. Armstrong: Rpt. Colonial Vet. Surg. and Assist. Vet. Surgeons for the Year 1899, Cape of Good Hope, G. 35—1900, 4.
23. A. Bernhard Smith: Poisonous Plants of all Countries, 1923, 2nd Edition, 47.
24. I. Schapera: Bantu Studies, 1925, ii, 200.
25. —. Trenk: Mitt. a. d. Deutsch. Schutzgeb., 1910, xxiii, 166.
26. W. Lenz: Arb. Pharm. Inst. Univ., Berlin, 1911-12, ix, 227.
27. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 792.
28. A. W. Facer: Govt. Analyst So. Rhod. Memo., 17th July 1929.
29. D. G. Steyn: 16th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, 417.
30. W. Robertson: Rpt. Bacteriologist Agr. Dept. for 1904 in Rpt. Chief Vet. Surg., 30th June 1904. Cape of Good Hope, G. 41*—1904, 49.
31. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, Part II, 718, 719.
32. F. W. Freise: Apoth. Ztg., 1929, xliv, 1480, through Qtly. J. Pharm. and Pharmacol., 1930, iii, 123.
33. W. Spoon and M. van Royen: Ber. Afdeel. Handelsmuseum. Ver. Koloniaal Inst., 1928, xxxiv, 3, through Chem. Abs., 1929, xxiii, 3374.
34. E. de'Conno, S. Capalbi, and L. Fruitier: Ann. chim. applicata, 1929, xviii, 540, through Chem. Abs., 1929, xxiii, 4846.
35. F. J. Dunning: J. So. Afr. Vet. Med. Ass., 1931, ii, 43.

LXII. ANCARDIACEAE

The seed kernel of **Anacardium occidentale L.,** Cashew, is edible (Kobert). The pericarp contains internally a dark brown, acrid, *oily juice* which is a powerful vesicant.[1, 2] In India it is used medicinally and for preserving floors, woods, books, etc., from white ants.[2] The Andaman Islanders use it for preserving fishing nets.[2] It contains *cardole* and *anacardic acid*, the irritant action being due to the former. Both the swollen fruit-stem and the true fruit are edible. The fruit juice is acid and astringent, and has been recommended overseas in uterine troubles and in dropsy.[3] A spirit, distilled from the fermented juice, is said to be diuretic.[3] A gum exudes from the bark and is known as *cashew gum*. It is a mixture of true gum and bassorin, and is not wholly soluble in water.[3] In Europe, dock workers unloading vanilla are subject to a skin condition, known as vanilla-itch. It is thought to be due to cardole from the fact that an extract of Anacardium occidentale is painted on the pods to give them a bright brown shiny appearance (Kobert).

A decoction of the bark of **Sclerocarya caffra Sond.,** Morula, Zulu and Tonga *umGanu*, Ronga *nkanye*, Hlengui, Chopi, Tsua, and Tonga *tsula*, Chuabo *motula-e-ntula*, Katanga *morula*, is taken in half-pint doses in dysenteries and diarrhoeas. The decoction has also been used for the treatment of malaria, and is said to act clinically like quinine. It is thought that, for this purpose, the bark is most active if gathered just before leaves appear on the trees. In the North-Eastern Transvaal a brandy tincture of the bark is taken in small doses as a prophylactic against malaria, and the powdered bark in teaspoonful doses in its treatment. The fruit is used by natives in the Eastern Transvaal and Portuguese East Africa for the brewing of beer, and in some districts of the latter a potent spirit is distilled from it. The fruit kernel is rich in oil. Bryant states that the Zulus use a decoction of the bark, externally and internally, as a prophylactic against gangrenous rectitis. He states also that in Zululand the fruit is used for the destruction of ticks, and regards it as definitely insecticide. Pijper says that it is commonly held in the Transvaal that the eating of the fruit causes fever (enteric or malarial), but he mentions that he cannot understand this, because the fruit does not ripen until after the fever season. In the extreme North-Eastern Transvaal it does, however,

ripen during the malarial season, viz., in March. Madagascar bark contains 3·5 per cent. of *tannin*.[4] Transvaal bark, collected in October before the appearance of the leaves, contains 20·5 per cent. and a trace of alkaloids.[5] The bark is therefore certainly astringent in diarrhoeas, but is extremely unlikely to produce benefit in malaria. According to Marloth[6] the fruit yields a slimy pulp containing a sugar, and citric and malic acids. The dried fruit kernels yield 60 per cent. of a non-drying oil.[7]

The Zulus use a decoction of the bark of **Harpephyllum caffrum Bernh.**, Kaffir plum, Cape ash, Essehout, Zulu *umGwenya*, as an emetic and "blood purifier." The fruit contains citric and malic acids,[6] and is edible (Harvey).[8]

A cold infusion of the root of **Lannea** (=**Odina edulis Sond.**), Wild grape, Wilde-druiwe, Lamba *umuLambalamba*, Venda *muporotso*, is used by the Lambas for treating diarrhoea. In the Northern Zoutspansberg the natives take a decoction of the root, particularly of its bark, in frequent large doses for blackwater fever. **Lannea discolor Engl.**, Bemba *kayimbe*, Bizalola *babumba*, is used medicinally by the Bembas and Bizalolas.

Schinus molle L., Pepper tree, Californian pepper tree, Peruvian mastic tree, commonly grown as a shade tree in the drier parts of South Africa, is a potent cause of hay fever.[9] The leaf contains a *volatile oil*, which has been used in place of cubebs in the treatment of gonorrhoea.[3] The leaf, bark, and gum resin have also been used medicinally.[3] The fruit yields from 3[10] to 5·2[11] per cent. of a volatile oil, containing *phellandrene*,[12] *carvacrol*, and *pinene*. It also contains traces of a sugar and of a crystalline bitter principle.[10] The drupes have been used as an adulterant of pepper.[20] The effect of the plant has been investigated on the isolated uterus of the guinea-pig with no result.[21]

The powdered bark of **Heeria paniculosa Engl.** (Anaphrenium paniculosum Engl.), Zulu *umFuco*, Xosa *isiFuku*, is a Zulu remedy for acute inflammatory conditions in the chest. It is used as an enema and by the mouth. For adults, it is preferably used with **Rhamnus zeyheri Sond.** The gum has a pleasant odour of incense, and is used by the Zulus for closing holes and cracks in domestic utensils. They also use the bark in abdominal derangements in animals, but it seems to produce little benefit. The pericarp yields a *volatile oil*, and the crushed fruits, after extraction of this, a *fixed oil*.[13] The former represents 5·5 per cent. and the latter 30 per cent. of the entire fruit weight. The volatile oil is useless for commercial purposes on account of the absence of odour. The fixed oil is clear, dark brown, and viscous, with a pleasant aromatic odour.

The bark and leaves of **Heeria argentea (E. Mey.) O. K.** (Anaphrenium argenteum E. Mey., or Rhus thunbergii Hook.), Kliphout, are used for tanning. The bark contains 33 per cent. of *tannin* and the leaves and twigs 4·8 per cent.[14]

Rhus natalensis Bernh. is probably used medicinally by natives, but we have no details. The Nyanjas of Nyasaland take a decoction of the root of **Rhus insignis Del.** (Anaphrenium insignis Del.), Nyanja *nyamazua*, for indigestion. The Zulus use a milk infusion of the leaf of **Rhus viminalis Vahl.**, Rosyntjiebos (Little Namaqualand), Zulu *isiHlakothi*, Suto *mosilabele* (*var.* gerrardi Engl.), as an enema for abdominal derangements in children (Phillips).

The bark of **Rhus longifolia Sond.,** Zulu *isiFuce, isiFuco,* yields a *gum* which is used by the Zulus to fix assegai blades in the handles. The gum is also used as a depilatory by smearing the fingers with the gum and grasping the hair firmly and pulling it out by the roots. The bark contains about 7 per cent. of *tannin.*[15]

The Sutos regard the fruit of **Rhus discolor E. Mey.,** Suto *kopšane, kopšwane, mohlohlwane,* Xosa *umNunga-mabele, umGumabela,* as constipating. The death of a native from taking **Tephrosia sp.** and **Rhus discolor** is recorded.[16] *Post mortem,* there was found gastro-intestinal inflammation and haemorrhages in the gastro-intestinal mucosae, kidney, bladder, and lungs. The Tephrosia sp. is the more likely toxic agent of the two.

The wood of **Rhus cotinus L.,** Hungarian fustic, Young fustic, Venice sumach, Smoke tree, is the source of a yellow dye, fisetin,[3, 17] which is said to occur as a *tannin glucoside.* The leaf contains a high percentage of *tannin,* and was formerly used for tanning.[17]

The Sutos use **Rhus divaricata E. and Z.,** Suto *koditsane,* as a colic remedy, mixed with **Scabiosa columbaria L., Cussonia paniculata E. and Z.,** and **Rhus erosa Thunb.,** Bessingbos, Soettaaibos, Suto *tsilabelo,* for diarrhoea in man and cattle (Phillips). The Sutos also take a decoction of the root for colds and influenza. A decoction of the leaf of **Rhus undulata Jacq.,** Taaibos, Garra, Hottentot *l|guara, p|guara,* is a Hottentot remedy for post-parturient troubles (Laidler). The Kwenas and Chuanas use an infusion of **Rhus pyroides Burch.,** *var.* **gracilis (Engl.) Burtt-Davy,** Kwena and Chuana *moxalire,* as an eye lotion in diseases of the eye.

The wood of **Rhus lancea L. f.,** Karee, Kareeboom, Thlaping *mosilabele,* and the root of **Rhus tridactyla Burch.,** Kareebos, Suurkaree, Thlaping *mokhidi,* are used for tanning by the Thlapings (Ferreira). According to Bowie,[19] **Rhus lucida L.,** Taaibos, was used formerly in tanning.

An infusion of the decorticated root of **Rhus gueinzii Sond.,** Rooibos, is used in bilharziasis by the Sutos. It is said to check the haematuria, and is astringent.

A **Rhus sp.,** Taaibos, contains tannin—bark 10·15 per cent., twigs and leaves 7·98 per cent.[18]

REFERENCES

1. G. A. Turner: Transvaal Med. J., 1908-9, iv, 202, 204.
2. Bull. Imp. Inst., 1916, xiv, 115, 116, 117.
3. United States Dispensatory, 1926, 21st Edition, 1200, 1310, 1465.
4. A. Deforge, J. Maheu, and F. H. de Balsac: Halle aux Cuirs, 1929, 238, through Chem. Abs., 1929, xxiii, 5607.
5. Marie G. Brandwijk: Pharmaceut. J., 1928, cxx, 172, 192, 212.
6. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 11.
7. Bull. Imp. Inst., 1920, xviii, 129, 481, 1923.
8. W. H. Harvey: Thesaurus Capensis, 1863, ii, 16.
9. G. Potts: So. Afr. J. Sci., 1922, xix, 146.
10. A. Cremonini: Chim. App., 1928, xviii, 361, through Qtly. J. Pharm. and Pharmacol., 1929, ii, 127.
11. E. Gildemeister und K. Stephan: through Chem. Zent., 1898, i, 513.
12. O. Wallach: Nachr. Ges. Wiss. Götting, 1905, 2, through Chem. Zent., 1905, ii, 674.
13. Bull. Imp. Inst., 1921, xix, 24.
14. Bull. Imp. Inst., 1928, xxvi, 312.
15. J. Medley Wood: Natal Plants, i, 56, Plate 69.
16. C. F. Juritz: Rpt. of the Senior Analyst for the Year ending 31st December 1905, Cape of Good Hope, G. 43—1906, 42-43.

17. A. Tschirch : Handbuch der Pharmakognosie, iii (1), 114 ; iii (2), 930.
18. C. F. Juritz : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.
19. James Bowie : Comm. to So. Afr. Institution, 30th September 1829.
20. A. Cremonini : Ann. chim. appl. Roma, 1930, xx, 309, through Qtly. J. Pharm. and Pharmacol., 1931, iv, 124.
21. S. F. Maldonado Morena : Compt. rend. Soc. Biol., 1922, lxxxvii, 563, through Chem. Abs., 1922, xvi, 3707.

LXIII. AQUIFOLIACEAE

Ilex capensis Sond. and Harv., Suto *molo-wa-phofu*, *phukhu*, is used by the Sutos as an enema for colic in children (Phillips). Marloth states that the plant is the same as Ilex mitis (L.) Radlk. The lather, from pounding in water the bark and fresh leaf of **Ilex mitis Radlk.,** Water tree, Water wood, Cape holly, Waterboom, Waterhout. Without, Zulu *isiDumu*, is used by the Zulus for washing the patient's body in influenza.

LXIV. CELASTRACEAE

Gymnosporia buxifolia Szysz. (Celastrus buxifolius L.), Lemoendoring, Pendoring, Gifdoring, Zulu *umKhokhozo*, *inGwavuma*, Chuana *motono*, Thlaping *motlhonu*, Suto *sefea-maeba*, *sefea-maeba-se-senyenyane*, is used medicinally. An infusion of the bark is a Zulu remedy for diarrhoea, given as an emetic or as an enema. They use the bark and the leaf for diarrhoea in stock. The Chuanas, Kobas, and Subjas of the Caprivi Strip take a decoction of the root and thorns for chest colds and cough. A Suto snake-bite remedy is made from the plant mixed with parts of snakes (Phillips). The Thlapings use the thorns for extracting other thorns from the feet and ritualistically in heart disease (Ferreira).

Gymnosporia deflexa Sprague, Transvaal saffraan, yields a *manna*, which consists of *dulcitol*.[1]

The Karangas use a **Gymnosporia sp.,** Karanga *chizuzu*, as a remedy for epilepsy and madness.

The Zulus drink a decoction of the root of **Celastrus sp.** (?), Zulu *i Hlinzanyoka*, for pains in the chest (Bryant).

The leaf of **Catha edulis Forsk.** (Methyscophyllum glaucum E. and Z.), Bushman's tea, Boesmanstee, Spelonketee, has been used as a stimulant here, and particularly in North Africa. It is found to be excellent for this purpose. The Bushmen make a stimulating beverage from the leaf and also chew the young shoots as a stimulant. The plant is inebriant. Pappe states that an infusion of the leaf is pleasant to the taste, and was used in cough, asthma, and other diseases of the chest. Stow [2] mentions that the Bushmen use the shoots as a specially nourishing food, and that they are slightly bitter, yet pleasant, and have a strong sweet taste of liquorice.

Mosso [3] isolated from the leaf an alkaloid, *celastrin*, and Flückiger and Gerock [4] an alkaloid, *katine*. Tschirch thinks that these two alkaloids are identical. Beitter,[5] later, isolated a *katine*, a strongly odorous *volatile*

oil and *tannin* from the leaf, and 50·78 per cent. of *fixed oil* from the seed. Stockman [6] isolated three alkaloids, which he named *cathine*, *cathinine*, and *cathidine*.

Chevalier [7] finds that *cathine* has a stimulant-narcotic action on the central nervous system, similar to that of *cocaine*, but no analgesic or anaesthetic properties. It has also cardio-toxic effects similar to caffein. Stockman [8] records that *cathine*, *cathinine*, and *cathidine*, though they differ in detail, all produce a stimulant-narcotic action, resembling somewhat that of *cocaine* and *caffeine*. Wolfes [13] finds that cathine is *d-nor-iso-ephedrine*, $C_9H_{13}ON$, a crystalline alkaloid melting at 77° C. and easily soluble in water. It is odourless, is strongly alkaline, and has an ephedrine-like action. Flückiger and Gerock [4] and Beitter [5] found no caffein in the plant, though Henry [9] states that the flower contains a *purin* derivative.

The bark of **Pterocelastrus variabilis Sond.,** Cherry wood, Candle wood, Kershout, contains 5·11 to 6·13 per cent. of *tannin*, and that of **Pterocelastrus rostratus Walp.,** White pear, 2·09 per cent.[10]

The Zulus use a milk or whey infusion of the bark of **Cassine aethiopicum Thunb.** (Elaeodendron aethiopicum Oliv.), Zulu *inQayi*, as a drench for calves with worms.

The root of **Cassine croceum DC.** (Elaeodendron croceum DC.), Saffron wood, Saffraanhout, Xosa *um Bomvane*, is an Xosa emetic, and is used by their witch-doctors for trial by ordeal (Smith). Smith states that all who partake of a decoction die. Juritz [11, 12] states that, on two occasions, the plant has come under the notice of the Department of Chemistry as a suspected cause of human death. He isolated a coloured glucoside from the wood and could find no other product.[12] The bark yields 1·02 to 14·2 per cent. of *tannin*, and the twigs and leaves 3·25 per cent.[10]

As a dysentery and diarrhoea remedy, the Zulus take an infusion of the root bark of **Elaeodendron velutinum Harv.,** Zulu *inQayi*, or inject a decoction as an enema (Bryant).

Dornan states that in Rhodesia the natives use an **Elaeodendron sp.** for trial by ordeal. If the accused becomes rapidly unconscious, without vomiting, he is guilty. The administration is frequently followed by vomiting and purging, when the accused recovers.

REFERENCES

1. Bull. Imp. Inst., 1913, xi, 332.
2. R. B. Young: The Life and Work of Geo. Wm. Stow, 1908, 29-30.
3. —. Mosso: Arch. ital. de Klin. Med., 1891, 64, through Tschirch.
4. Flückiger and Gerock, through Tschirch.
5. A. Beitter: Arch. der Pharm., 1901, ccxxxix, 17.
6. R. Stockman: Pharm. J., 1912, lxxxix, 676.
7. J. Chevalier: Bull. Gen. Thérap., clxi, 572, through Chem. Abs., 1912, vi, 254.
8. R. Stockman: J. Pharm. Exp. Therap., 1913, iv, 251.
9. T. A. Henry: The Plant Alkaloids, 1924, 2nd Edition, 340.
10. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.
11. C. F. Juritz: So. Afr. J. Sci., 1914, xi, 117.
12. C. F. Juritz: Chem. News, 10th April 1925.
13. O. Wolfes: Arch. der Pharm., 1930, cclxviii, 81.

LXV. ICACINACEAE

The Zulus use an infusion of the root-bark of **Apodytes dimidiata E. Mey.**, White pear, Witpeer, Zulu *umDakane*, and other plants, as an enema for intestinal parasites (Bryant).

As a prophylactic against miscarriage and premature birth, they administer an infusion of the root of **Pyrenacantha scandens Planch.** in large doses (Bryant).

LXVI. SAPINDACEAE

According to Bryant the Zulus use **Cardiospermum helicacabum L.**, Balloon vine, Zulu *uZiphu*, *iKhambi-leziduli*, for a variety of purposes. An infusion of the leaf and stalk is given as an enema for dysenteries and diarrhoeas. The pungent vapour from the crushed leaf is inhaled to relieve headache. In bladder troubles, a poultice of the leaf and other plants is applied over the bladder, after anointing the skin. This leaf paste is also applied to syphilitic sores. For a general outbreak of sores over the body, an infusion of the leaf is drunk. From what Bryant says, the leaf appears to be irritant. Pammel states that the plant contains a *saponin*.

An infusion of the root of **Deinbollia oblongifolia Radlk.** (Sapindus oblongifolius Sond.), Zulu *iGolo-lenkawu*, Tonga *masibele*, Chuabo *ntalala*, and other plants is taken by the Zulus for dysentery and diarrhoea (Bryant). The fruit is edible (Medley Wood), and the seed is covered with a material which froths in water (de Almeida).

The kernels of **Pappea capensis E. and Z.**, Bergpruim, Wilde-pruim, Kaambessie, Oliepitte, are rich in oil.[1] Pappe states that though the oil is edible it is somewhat purgative, and is used as an external application in tinea capitis, alopecia, and similar diseases.

Dodonaea viscosa L., Gansies, Kankerbos, Chopi and Lenge *tsekatseki*, is used for many diseases, but particularly for stomach disorders. In Peru the leaves are chewed, like coca leaves, as a stimulant. They contain an *alkaloid*, and sometimes occur as an adulterant of coca leaves (Tschirch). Pammel states that the plant is a fish poison.

An infusion of **Dodonaea thunbergiana E. and Z.** (Dodonaea angustifolia Thunb.), Ysterhoutbos, Ysterhouttoppe, Sandolyf, Sandolien, is used in pneumonia and other pulmonary conditions, including tuberculosis. Thunberg and Pappe mention that a decoction of either the plant or the wood (it is not clear which) was used as a purgative in fevers, and Marloth, that the young twigs are used as a tonic and purgative. Du Plessis [2] states that an infusion of the flowering tops is "bitterish," but has no marked effects. He isolated *saponins* and a *trace* of *alkaloids* from the leaf.

Hippobromus alatus E. and Z. (Hippobromus parviflorus (L.) Radlk.), Horsewood, Basterperdepis, Zulu *uQume*, *uQhume*, Xosa *uLwathile*, is widely used by natives. The Xosas use the leaf juice as a local application for eye inflammations in man and beast. This use may have spread to other tribes.

The Zulus use the root as a love charm, but it is interesting to note that the swallowing of the froth, which forms when it is mixed with water, results in vomiting. They also give an infusion of the leaf and root to stock for cough, and put a decoction into the nose of sheep and goats to make them sneeze, so as to clear the nose of mucus. Bryant states that the plant is poisonous and that the Zulus inhale the vapour from the crushed leaf to relieve headache.

REFERENCES

1. Bull. Imp. Inst., 1919, xvii, 488.
2. I. P. J. du Plessis: So. Afr. J. Sci., 1923, xx, 258.

LXVII. MELIANTHACEAE

According to Bryant, **Bersama lucens Szysz.,** Zulu *isi Ndiyandiya,* is poisonous, and the bark is used by the Zulus to relieve menstrual pain. The bark of **Bersama swinnyi Phill.,** Pondo *isiNdiyandiya,* is a Pondo medicine, but we do not know how it is used. The bark of **Bersama tysoniana Oliv.,** Bitter bark, Bastard sneezewood, is said to be used medicinally by natives. It is apparently bitter.[1]

Melianthus comosus Vahl., Kruidjie-roer-my-nie, Truitjie-roer-my-nie, Xosa *ubuHlungu-bemamba, ubuTyayi* (Queenstown), Transvaal Zulu and Swazi *i Bonya,* is widely used as a medicine. A decoction of the plant is applied to wounds which are healing slowly, and a leaf paste as a dressing for sores and to reduce the swelling of bruises. The Xosas use the plant as a snake-bite remedy by applying a paste of the leaf or a tincture of the root-bark or of the leaf to the wounds. According to Smith, the Xosas sometimes administer a small amount of the root-bark in water, in addition to the local treatment. The Xosas regard the root-bark as very poisonous, but, none the less, take it in very small doses as a general tonic, especially in dyspepsia. It is said to be strongly emetic, the vomit being foamy. The Transvaal Zulus and Swazis drink a decoction of the leaf, made with the addition of the bulb of another plant, night and morning, " to clean the system and keep the blood clean." A bath containing the plant is used to promote sweating and a hot decoction to bathe rheumatic limbs. In the Queenstown district, natives use the decoction to relieve foot troubles. The leaf and root have apparently, on one occasion, caused the death of a man.[2] There was isolated, at this time, 0·065 per cent. of an active principle. Experimentally, in animals, a 5 per cent. decoction of the leaf and stem produces vomiting and other symptoms of gastro-intestinal irritation. Subcutaneous injection of an aqueous infusion of the root into animals caused lassitude, loss of appetite, vomiting, and death. *Post mortem,* there was local necrosis at the point of injection, and congestion of the internal organs.[2] Steyn [3] drenched a sheep with 80 grm. of the dried leaf, flower, and young fruit. In three hours it showed dyspnoea, cyanosis, hoven, and feeble accelerated pulse, death occurring four and a half hours after administration. *Post mortem,* haemorrhagic inflammation of the duodenum, jejunum, and various organs was found. It appears from these two sets of observations that the plant is irritant.

A decoction of **Melianthus major L.**, Kruidjie-roer-my-nie, Truitjie-roer-my-nie, Kruidjiebos, Kriekiebos, Xosa *ubuHlungu-bemamba*, is used as a lotion for sores. The root is regarded as a dangerous poison. The Xosas use it as an emetic, the vomit being foamy, and as a snake-bite remedy. Pappe records that a decoction of the leaf is excellent in the treatment of tinea capitis, "crusta serpiginosa," necroses, and foul ulcers, and as a gargle in sore throat and in diseases of the gums. The bruised leaf, he states, promotes granulation in ulcers. In the Transvaal, Europeans apply to boils a poultice of flour and the plant, boiled in water (Pijper). Eaten by stock, the plant causes an irritant poisoning,[4] which may prove fatal. Steyn [3] has confirmed its toxicity in animals, the symptoms and *post-mortem* findings suggesting an irritant poisoning.

According to Marloth, if **Melianthus minor L.**, Kruidjie-roer-my-nie, is taken by the mouth it produces emesis.

REFERENCES

1. Bull. Imp. Inst., 1916, xiv, 37.
2. C. F. Juritz: So. Afr. J. Sci., 1914, xi, 125.
3. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 798, 799.
4. H. H. Curson: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 216.

LXVIII. RHAMNACEAE

Zizyphus mucronata Willd., Buffalo thorn, Wag-'n-beetjie, Wag-'n-beetjie-doring, Blinkblaar, Blinkblaar-wag-'n-beetjie, Buffelsdoring, Xosa and Zulu *umPhafa*, *umHlahla-nkosi*, Chuana and Pedi *mokxalo*, Thlaping *bokxalo*, Swazi or Zulu *umlahl-abantu*, is much used as a medicine. The Zulus take the powdered leaf and bark in water as an emetic in chest troubles. According to Bryant, they also use liberally a hot infusion of the bark for cough. Natives, in general, apply a poultice of the leaf to boils, carbuncles, and other septic swellings of the skin. The Thlapings of Bechuanaland take an infusion of the root in dysenteries, and the Tongas chew the root and swallow the juice for the same purpose. In the Transvaal, a decoction of the root is taken internally and a paste of the leaf is applied to tubercular glandular swellings. Smith mentions that the Xosas used this treatment, and also the decoction, for lumbago. For pain of any sort, natives frequently apply a poultice of meal made with the decoction or of powdered baked root, the poultice being eaten thereafter. Hewat records that natives inhale the vapour and gargle with a decoction of the leaf and shoots for measles and scarlet fever. The berries are edible (Watt and van Warmelo), and are used by natives in making porridge or as a poor coffee substitute (Burtt-Davy). The root is glutinous (Medley Wood).

The Sutos use a decoction of the root of **Zizyphus zeyheri Sond.**, Haakdoring, Klein-wag-'n-beetjie, Suto *sekxalo*, Filabusi District (Northern Rhodesia) *mpafa*, for diarrhoeas and dysenteries. A tincture of the root is said to be equally effective. Natives also use the root, with **Pelargonium sidoides DC.**, in decoction, for worms in calves. The berries are edible, and are sometimes used by natives in the same ways as those of Zizyphus mucronata.

A decoction of the root of **Zizyphus helvola Sond.,** Pedi *sekxalwane*, Chuana and Kwena *sekxalo*, is taken by Chuana and Kwena women for menstrual troubles. A **Zizyphus sp.,** Toon-wag-'n-beetjie, is powdered, mixed with flour, and applied as a hot paste to sores and bruises.

A decoction of the decorticated root of **Rhamnus prinoides l'Hérit.,** Blinkblaar, Zulu *uNyenya*, Suto *mofifi*, is used by the Zulus as a " blood purifier " and by the Sutos for pneumonia. Bryant states that the Zulus make from the plant a liniment for simple sprains.

The Zulus use an infusion of the bark of **Rhamnus zeyheri Sond.,** Red ivory wood, Zulu *um Ncaka*, by the mouth and as an enema for pains and soreness in the back and for rectal ulceration in children. The fruit is pleasant, and is eaten by the Zulus.

Noltia africana (L.) Reichb., Soap bush, Xosa *iPhalode*, *iYeza-lesidiya*, is an Xosa remedy for " quarter-evil " (sponssiekte) in stock. A decoction of the leaf or root is used both prophylactically and therapeutically (Smith).

According to Bryant, the root of **Helinus ovata E. Mey.,** Soap-plant, Zulu *u Bububu*, *u Bubupu*, is used by Zulu doctors in treating an hysteria which affects them. The treatment consists of drinking, as an emetic, a cold infusion when it froths on stirring. The leaf contains *scyllitol*, $C_6H_6(OH)_6$ (an isomer of *inositol*), *tannin*, *aconitic acid*, a trace of *saponin*, and a considerable amount of inorganic matter.[1]

REFERENCE

1. J. A. Goodson : J. Chem. Soc., 1920, cxvii, 140.

LXIX. HETEROPYXIDACEAE

The Zulus administer, as a drench for diarrhoea in goats, donkeys, and cattle, the powdered leaf of **Heteropyxis natalensis Harv.,** Wild lavender, Lemon verbena (?), Zulu *um Khuzwa*.

LXX. VITACEAE

In the Transvaal a syrup made by boiling sugar and the juice of **Vitis sp.,** Vine, Grape, Druif, is applied locally in diphtheria (Pijper). Bender [1] records that Professor Monti of Turin prepares a concentrated grape juice by cooling. On treatment *in vacuo* a very stable grape honey is obtained, of which 1 kilo contains the nutritive value of 6 kilos of grapes. This grape honey makes a pleasant beverage with or without water, and it dissolves albumin, casein, fibrin, and resins. It should therefore be of considerable dietetic and pharmaceutical value.

The Rongas apply **Vitis quadrangularis L.** to wounds (de Almeida).

Zulu women take a decoction of the decorticated root (not the tuber) of **Rhoicissus cuneifolia (E. and Z.) Planch.,** Zulu *isiNwazi*, Suto *morara*, as an enema for painful menstruation. Bryant mentions a similar use, and that the

Zulus use it also as a remedy to facilitate the birth of the child or to initiate the birth if it is delayed in onset. Sterile Suto women drink a decoction to aid fecundation (Phillips). Suto children eat the fruit.

Natives in the Bikita district of Southern Rhodesia use **Rhoicissus,** *cf.* **Rhoicissus digitata (L. f.) Gilg. and Brandt.,** Karanga *gwidzi*, as an ophthalmic remedy.

It has been reported to us that a child which is thought to have eaten the ripe fruit of a **Rhoicissus sp.** developed pyrexia and generalised convulsions. The symptoms cleared up after emptying the bowel by means of calomel. We feel that the symptoms are not a specific result of eating the fruit, but due rather to dietetic upset.

Cissus hypoleuca Szysz., Wemba *mwangashi*, is used medicinally by the Wembas. The Mapulanas use the juice of the bulbous root of **Cissus cirrhosa (Thunb.) Willd.,** Droog-my-keel, with water as a gargle, as an internal remedy, and as an application to glandular swellings and to creeping sores. According to Marloth, the fruit is strongly irritant and astringent.

Marloth states that **Cissus crameriana Schinz.,** Botterboom (Damaraland), is poisonous.

The Zulus administer **Cissus (=Vitis succulenta Galpin),** Zulu *uMabululwane*, as a drench to horses suffering from " horse-sickness."

According to Harvey,[2] the Zulus rub the root of a wild vine, **Cissus lanigera Harv.,** Zulu *umThambiso*, on the gums to relieve toothache. He thinks it may be strongly astringent.

REFERENCES

1. G. Bender: Münch. Med. Wochenschr., lxi, 424, through Chem. Abs., 1914, viii, 2217.
2. W. H. Harvey: Thesaurus Capensis, 1859, i, 41.

LXXI. TILIACEAE

De Almeida reports that the juice of the stem and leaf of **Carpodiptera minor Sim.** is used by the natives at Lourenço Marques as a soap substitute.

Natives use the root of **Corchorus asplenifolius Burch.,** Zulu *uBangalala*, as a remedy for sexual weakness in men.

A decoction of **Corchorus serraefolius Burch.,** Besembos, is used internally and as a mouth-wash by Europeans for stomach disorders in children.

The Zulus soak the bruised bark of **Grewia occidentalis L.,** Four corners, Button wood, Assegai wood, Bow wood, Kruisbessie, Knoppie-hout, Zulu *iKlolo* (iRrolo), *iLalanyathi*, Xosa *umNqabaza*, Suto *lesika*, in hot water and apply it as a dressing to wounds. Bryant says that they use the plant as a remedy to facilitate the birth of the child, or to hasten the onset of labour when it is retarded. Both the Zulus and the Xosas eat the berries, and the latter use the wood for assegai handles. Medley Wood states that the bark is mucilaginous. Burchell records that the Klaarwater Hottentots (mixed race) distilled a spirit from the berries of **Grewia flava DC.,** Brandy bush, Brandewynbos, Kafferbessie, Rosyntjiebos. The bush is eaten by cattle.

Bryant states that Zulu women take a hot infusion of the root of **Triumfetta rhomboidea Jacq.**, Zulu *iNothwane, inDola-encane,* to facilitate childbirth or to hasten the inception of parturition when it is delayed.

LXXII. MALVACEAE

Europeans drink an infusion of the leaf of **Malva parviflora L.**, Mallow, Kiesieblaar, Kasieblaar, Suto *mosala-suping, qena, tika-motse, thiba-pitsa*, Xosa *uNomolwana*, as a " nerve tonic " (Wicht), and apply the leaf as a hot poultice to wounds and swellings. The Xosas have a similar use to the latter, and often use a decoction as a lotion (Smith). The Sutos use the decoction as a remedy for tape-worm and for profuse menstruation. Phillips mentions that they also make a lotion for bruised limbs from the plant.

Walsh states that **Malva parviflora L.** is said to produce symptoms similar to " Dronkgras " intoxication (*cf.* Equisetum ramosissimum Desf.), and Burtt-Davy [1] regards the plant as too dangerous for use as a stock food. In Australia it causes in sheep the disease known as " staggers " or " shivers," which has been confirmed by feeding tests.[2] The symptoms resemble those of krimpsiekte (Cotyledon poisoning).[2]

Pyper records that, in the Transvaal, Europeans apply a poultice of the leaf of **Malva rotundifolia L.**, Mallow, Dwarf mallow, Kiesieblaar, in inflammations of the breast, and Pappe, that the leaf, as decoction, fomentation, or poultice, was formerly used in sore throat and ophthalmia, or for maturing abscesses. He mentions also that the whole plant is mucilaginous and emollient. The leaf has been used in Europe and America, in the form of an infusion or a decoction, for catarrh, dysenteries, and nephritis.

The Fingos apply a paste of the dried leaf of **Sida longipes E. Mey.** (Sida capensis E. and Z.), Spider leg, Fingo *umDiza-wethafa*, to sores.

Sida rhombifolia L., Queensland hemp, Pretoria-bossie, Taaiman, *iVavane,* though it occurs in South Africa, is apparently not used medicinally. In Europe and other parts, however, it has been regarded as a valuable remedy in pulmonary tuberculosis and rheumatism, and has been used as a snake-bite remedy. The root is mucilaginous, and has been used as a substitute for that of **Malva rotundifolia L.** An extract of the plant, *mesebé*, attracted a great deal of attention as a tuberculosis remedy.[3] Conflicting reports of its efficacy were published.[3] It is probably useless. Pammel states that the ripe capsules cause death in fowls which feed on them. Steyn [4] records that the plant has been suspected of causing *dronkgalsiekte* in cattle, but a feeding test in a sheep proved negative.

Sida cordifolia L., Thonga *šitjhesinyana ša ntlhaba*, is used by the Thongas as a children's remedy (de Almeida).

The root of **Hibiscus pusillus Thunb.**, Zulu *uGugukile, uVuma*, is used by the Zulus as an emetic in the treatment of " bad dreams " and by men as part of the preparation for courting. **Hibiscus trionum L.**, Black-eyed Susan, Suto *solwane, lereletsane, lereletsane-le-leholo*, Xosa *iYeza-lentshulube*, is used medicinally by the Sutos. Hewat states that it is a native round-worm

remedy. **Hibiscus sabdariffa L.,** Natal sorrel, Jamaica sorrel, is not used medicinally in South Africa but is used by natives in East Africa. The leaf is apparently acid, like those of **Rumex acetosella L.,** and makes a good anti-scorbutic. The fruits are edible. Pammel states that the root contains *saponin*. The seed is said to be an aphrodisiac (de Almeida).

The Zulus use a lotion of the leaf and stem of **Hibiscus surattensis L.,** Zulu *uCathucathu*, for the treatment of penile irritation of any sort, including venereal sores and urethritis. It is sometimes applied as an ointment for the same purposes. An infusion is also used as an injection into the urethra and vagina for gonorrhoea and other inflammations (Bryant). A leaf paste of **Hibiscus aethiopicus L.** is applied by the Xosas to septic wounds (Smith). The Manganjas of Nyasaland use the leaf of an **Hibiscus sp.,** Manganja *kweranyoka, insache*, as an application to wounds.

The Sutos use **Hibiscus leiospermus Harv.,** Suto *sefala-bohoho*, as a colic remedy, **Hibiscus malacospermus E. Mey.,** Suto *sekutle, seputle, bohoyana*, as a remedy for headache and other ailments, and **Abutilon sonneratianum Sweet.,** Suto *lethšeane*, as a stimulant for bulls in spring (Phillips).

REFERENCES

1. J. Burtt-Davy : 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1913, 213.
2. M. W. Henning : 11th and 12th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1926, i, 333.
3. E. Merck : Annual Report, 1912, xxvi, 405.
4. D. G. Steyn : 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, ii, 723.

LXXIII. BOMBACACEAE

The seeds of **Adansonia digitata L.,** Baobab, Monkey bread tree, Cream-of-tartar tree, Lemonade tree, Krimmetatboom, are embedded in a yellowish acidulous pulp, which, when dried, has been regarded as a " cream of tartar." There is some difference of opinion regarding the composition, for Heckel and Schlagdenhauffen [1] found 2 per cent. of free *tartaric acid* and 12 per cent. of *potassium bitartrate* in the fruit, while Pelly [1] found free *citric acid*, a trace of *malic acid*, an *acid* or acids of the *pectic* type (possibly acid potassium salts), and no tartaric acid. The Imperial Institute [2] isolated free *tartaric acid*, *potassium acid tartrate*, and a large proportion of *mucilaginous matter* from the fruit pulp. The leaf and bark abound in *mucilage* [1] and the leaf contains *sodium chloride, potassium acid tartrate*, and *tannin*.[2] The fruit has been used in making a pleasant acidulous drink for fever cases (Stow), and in Central Africa is used as a dysentery remedy,[1, 2] and for fevers.[2] The leaf is used as a diaphoretic in Central Africa,[1] and as a prophylactic against fevers, to check useless perspiration, and as an astringent.[2] Braun [3] states that the bark has occurred in European commerce since 1848 under the name of **Cortex cael cedra,** and was used in fevers, and as a substitute for cinchona bark.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1186.
2. Bull. Imp. Inst., 1906, iv, 252 ; 1907, v, 329.
3. K. Braun : Faserforschung, viii, 2, 90.

LXXIV. STERCULIACEAE

The Zulus use an infusion of the bark or wood of **Dombeya rotundifolia Planch.,** Vaalbos, Dikbas, Dralpeer, Zulu *inHliziyo-enkulu*, Shangaan *šiluvari*, Kxatla *mokxoba*, orally or per rectum for intestinal ulceration. Instead, they sometimes chew the bark hurriedly, and swallow the spittle while rejecting the particles of bark. Kxatla and Shangaan women drink a decoction of the bark when the menses are irregular, or to hasten the onset of labour when this is delayed. The preparation is thought to be used for procuring abortion. Along with **Euclea undulata,** it is used as a Suto headache remedy (Beyer).

Europeans apply an infusion or a decoction of **Hermannia cuneifolia Jacq.,** Geneesbossie, Ag-dae-genees-bossie, to sores, and take the preparation internally. An infusion of the root or leaf of **Hermannia botanicaefolia E. and Z.,** Asmabossie, Chuana and Kwena *lesokolla*, is drunk by Europeans for respiratory diseases, especially asthma. The Chuanas and Kwenas use a decoction for a like purpose. The root of **Hermannia depressa N. E. Br.,** Zulu *iTshesizwe*, Suto *phate-ea-ngaka*, *seletjane*, Pedi *moleko*, is a Zulu emetic. The Sutos use the leaf juice in water for stomach-ache, and it is said to be purgative and diaphoretic.

The Sutos use the crushed root of **Hermannia coccocarpa E. and Z.,** Suto *leilane-bolougo*, *boloulwana*, *seletjane*, *sehlare-sa-mollo*, *qena-e-nyenyane*, as a plaster for wounds, and administer a decoction of the root to horses for cough. Phillips records that the Sutos use the plant in the treatment of burns.

Hermannia paucifolia Turcz., Skitterybossie, Goewermentsbossie, is purgative, and causes severe purging when eaten by stock.[1, 2] MacOwan [2] states that animals often die from the effects, but that if animals are habituated to eating the plant, it makes an excellent fodder.

Feeding tests with **Hermannia brachypetala Harv.** show it to be toxic to stock, though not necessarily fatal.[1]

Hermannia hyssopifolia L., Ag-dae-genees-bos, Pokkiesblom, is used in making a tea with aromatic properties (Wicht). The Xosas use a decoction of the root of **Hermannia candicans Ait.,** Suto *lethšeane-la-thaba*, for dysuria (Smith).

An infusion of a **Hermannia sp.,** Bitterbos, is taken by Europeans for piles and erysipelas, and a decoction of a **Hermannia sp.,** Pedi *molla-madi*, in large doses by natives for " impure blood " (syphilis (?)).

The Chuanas use **Hermannia** (=**Mahernia veronicaefolia E. and Z.**), Rooiopslag, Chuana *sethlare-sa-dišo-tsa-banyana*, for eczema, a decoction as a lotion, and the powdered root as a dusting powder. Europeans apply the powdered leaf to suppurating wounds. The Sutos use **Mahernia chrysantha Turcz.,** Suto *kxwakxwa*, as a remedy for heartburn and other ailments, and hold it in high esteem for relieving flatulence in pregnant women (Phillips). They give **Mahernia cordata E. Mey.,** Suto *lethšeane*, *seletjane-se-seholo*, to bulls as a stimulant (Phillips).

Shangaan women take a decoction of the root of **Waltheria indica L.,** Shangaan *šimbongana*, Suto *lexutasela*, for barrenness. According to Beyer,

the Sutos either chew the raw root or drink a decoction of it for internal haemorrhages.

REFERENCES

1. E. P. Phillips: Botanical Survey of South Africa, Memoir IX, 1926, 26.
2. P. MacOwan: Agr. J. Dept. Agr. Cape Colony, 1893, vi, 452.

LXXV. OCHNACEAE

The Zulus use a decoction of the root of **Ochna atropurpurea DC.**, Zulu *umBomvane*, and other roots, as a remedy for gangrenous rectitis in children (Bryant). **Ochna,** *prob.* **Ochna o'connorii Phillips,** Lamba *umuNyano*, is a Lamba medicine. For headache they rub the powdered leaf into scarifications on the forehead, and drink an infusion of the root for pneumonia and other respiratory diseases.

The bark of **Ochna arborea Burch.,** Cape plane, Cape redwood, Rooihout, contains 8·21 per cent. of *tannin*.[1]

Steyn [2] reports that repeated daily feeding of the leaf and flower of **Ochna pulchra Hook.** to a sheep resulted in death on the sixth day. On the fifth day the animal developed an acute diarrhoea, with tympanites and respiratory symptoms. *Post mortem*, there was found general cyanosis, pronounced hyperaemia of the lungs, ruminal contents in the respiratory tract, and acute catarrhal duodenitis and jejunitis.

REFERENCES

1. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.
2. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, ii, 724.

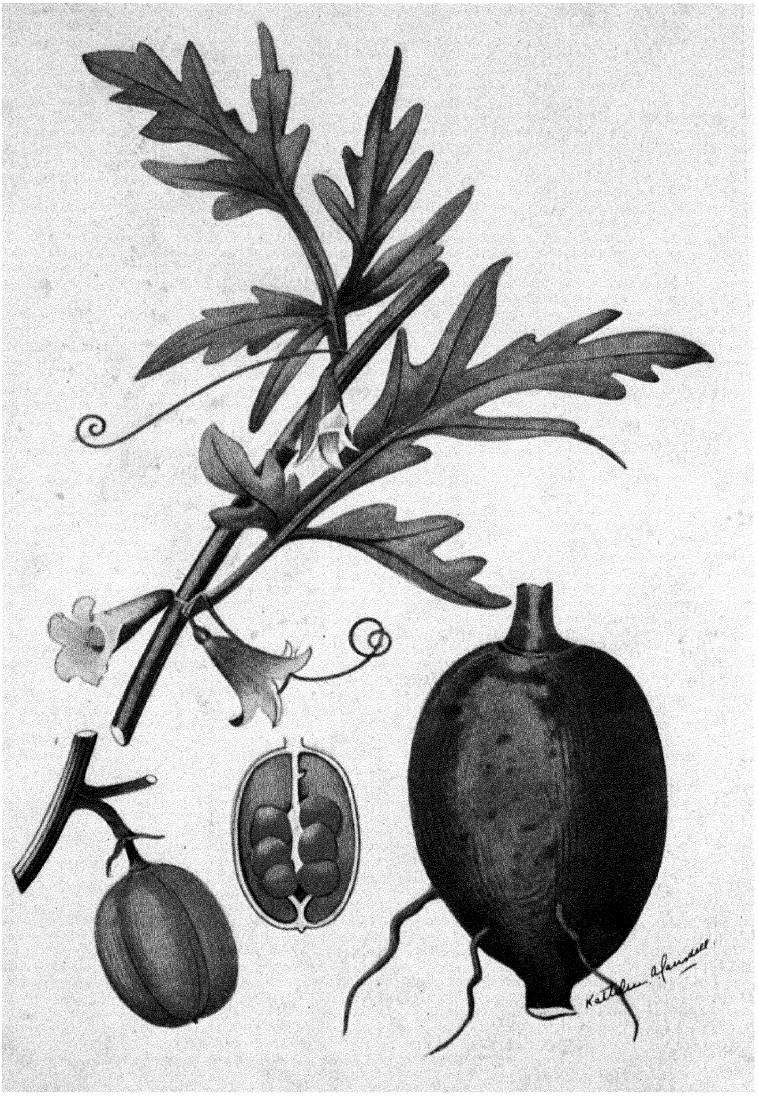
LXXVI. GUTTIFERAE

Phillips states that **Hypericum aethiopicum L.,** Suto *leilane*, *leilane-la-bale*, *bohohwana*, *tabane*, Zulu *uSukumbili*, is largely used by Suto women for administration to girls at the time of puberty. Bryant says that the plant is poisonous, and that the Zulus use the root pulp, in the form of an enema, for backache and fixed pains in the loins. **Hypericum lalandii Chois.,** Suto *bohlokwanyane*, is used medicinally by the Sutos.

Garcinia livingstonii T. And., Wild plum, Eshirma *motsauri*, *mokononga*, Hlengwe *imbe*, Ronga *mphimbi*, yields a gum. In Portuguese East Africa, natives eat the fruit and prepare from it a fermented beverage (de Almeida).

LXXVII. ELATINACEAE

A hot infusion of the fresh root of **Bergia decumbens Planch.,** Chuana *seatla-semadi*, is used by the Chuanas, Subias, and Kobas for easing "kidney disease pains" and to soothe stomach-ache.



ADENIA DIGITATA BURTT-DAVY.

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LXXVIII. TAMARICACEAE

Tamarix articulata Vahl., Tamarisk, Abiekwas-geelhout, Dawée, yields *tannin*, bark 10 per cent., wood 1 per cent., and galls 42 to 56 per cent.[1]

REFERENCE

1. F. Heim de Balsac, M. Heim de Balsac, and A. Deforge, through Chem. Zent., 1928, ii, 1412.

LXXIX. FLACOURTIACEAE

The fruit kernel of **Oncoba spinosa Forsk.,** Tonga and Zulu *umThumgwa*, Thonga, Ronga, and Chopi *tongwane*, *nchowana*, yields from 35·2 to 37·6 per cent. of a brownish-yellow fixed oil, similar to that obtained from **Oncoba echinata Oliv.,** but containing no chaulmoogric acid.[1] The oil has, therefore, no medicinal value.[1] Oil of gorli, from **Oncoba echinata,** resembles oil of chaulmoogra.[2]

Scolopia mundtii W. Arn., Red pear, Rooipeer, Klipdoring, Bergsaffraan (?) is thought to be poisonous. It is said to have caused the death of a native in Zululand, the symptoms being abdominal pain and vomiting. Another native recovered after being unconscious for twenty-four hours.

The powdered bark of **Homalium subsuperium Sraqre.,** Zulu *iDlebe-lendlovu-enkulu*, is a Zulu colic remedy.

The Zulus take an infusion of the leaf of **Trimeria alnifolia Planch.,** Wild mulberry, Wilde-moerbei, Grootblaar-ysterhout, Zulu *iDlebe-lendlovu*, and those of other plants, for abdominal troubles in general (Bryant).

REFERENCES

1. Bull. Imp. Inst., 1923, xxi, 585.
2. E. Perrot and M. T. François: Bull. Sci. Pharmacol., 1929, xxxvi, 551.

LXXX. TURNERACEAE

Wormskioldia longipedunculata Mast. is used by natives in the Filabusi district of Southern Rhodesia as a remedy for sore eyes.

LXXXI. PASSIFLORACEAE

The Zulus take an infusion of the root of **Tryphostemma sandersoni Harv.** to prevent violent abdominal pains after sexual intercourse when they think that their amours may have been "doctored."

The fruit of **Adenia digitata Burtt-Davy** (Modecca digitata Harv.), Chuana *mojaja*, is poisonous, death after eating it taking place within a few hours in human beings. The Chuanas apparently use the fruit for homicidal purposes.

Sheep and goats are also said to be susceptible to the poison. The symptoms are severe abdominal pain and purging. In other cases, the poisoning took place in children, three to four years old, the symptoms being those of a severe gastro-enteritis, vomiting, and purging. The children recovered under treatment by gastric lavage and bismuth chalk. Fatal cases of human poisoning by the fruit and root have previously been recorded.[1, 2] Eating of the root also causes gastro-enteritis.[1] The root contains a *cyanogenetic glucoside*, which is rapidly and almost completely destroyed by desiccation,[1] so that if the fresh root is eaten, hydrocyanic-acid poisoning may develop. The hydrocyanic-acid content of the root varies greatly in different samples,[3] Green and Andrews [1] obtaining 0·04 per cent. in fresh material. The root also contains a toxalbumin *modeccin*. The gastro-enteritis, resulting from ingestion of the root, is due to this principle, which is enormously toxic, 0·00001 grm. per kilo intravenously being the minimum lethal dose in the rabbit.[1] The lethal amount of fresh root in man, taken by the mouth, is estimated to be about 1 oz.[1] It should be noted that the turnip-like root of **Adenia digitata Burtt-Davy** is often mistaken for edible roots, particularly those of **Coccinia spp.**, which are non-toxic. The human cases of poisoning by the root result from this confusion ; those by the fruit are usually seen in children, who eat it casually.

The leaf of **Adenia glauca Schinz** contains *hydrocyanic acid*.[4] None the less, 100 grm. of minced-up fresh leaf has no effect on a rabbit, which is ascribed to the free escape of the hydrocyanic acid during the process of mincing.[4] The bulb of an **Adenia sp.** (*So. Afr. Nat. Herb. No.* 7611) proved rapidly fatal to an animal (species not specified), the symptoms being dyspnoea and paralysis.[4] *Post mortem*, there was cyanosis and marked hyperaemia of the organs.[4] These effects are suggestive of hydrocyanic-acid poisoning.

The boiled root or a root decoction of **Adenia senensis (Klotzsch.) Engl.**, Nyanja *tawawawa*, *lawawa*, is used by the Nyanjas in the local treatment of leprosy, ulcers, and other skin affections.

According to Harvey, the fruit of **Adenia hastata Harv.** (Modecca hastata Harv.) resembles the granadilla, and is edible. **Adenia kirkii (Mast.) Engl.** (Modecca kirkii Mast.), Thonga *menyomamba*, is used by the Thongas in Portuguese East Africa in the treatment of bronchitis (de Almeida).

The Zulus use the powdered leaf and stem of **Ophiocaulon gummifera Harv.**, Zulu *umPhinda*, *imFulwa*, *inTelezi*, as an emetic for biliousness. In Portuguese East Africa the Zulus and Rongas use a decoction of the root for malaria and leprosy, and the leaf boiled in water for a steam bath in malaria. The ingestion of the decoction is said to produce vomiting and perspiration. Bryant states that the plant is poisonous, and that an infusion is used by the Zulus as a tonic in convalescence from febrile attacks. Medley Wood mentions the tonic use among the Zulus, but states that it is administered particularly to children and cattle.

REFERENCES

1. H. H. Green and W. A. Andrews : 9th and 10th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1924, 381.
2. I. B. Pole Evans : The Flowering Plants of South Africa, 1923, iii, Plate 113.
3. H. H. Green and P. Kamerman : J. So. Afr. Chem. Inst., 1924, vii, 3.
4. D. G. Steyn : 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 799.

LXXXII. CARICACEAE

Wicht states that **Carica papaya L.,** Melon tree, Papaw, Paupau, is beneficial in dysenteries. The latex, which is most readily collected by scarification of the unripe fruit, is acid in reaction, has an astringent, bitterish taste, and a specific gravity of 1·023. On allowing it to stand, it separates into an aqueous liquid and a white, somewhat coagulated pulpy mass. The liquid contains an albuminous enzyme, *papain* or *papayotin*, which has much the same effect on proteins as *trypsin* and *pepsin*.[1] This action is widely used, in countries where papaw grows, to render tough meat tender, by smearing it with the latex or an infusion. The juice also contains a milk-curdling ferment.[1] Hofstede[5] has studied certain aspects of the action of papain. The seed contains a glucoside, *caricin*, and a ferment, *myrosin*. Caricin resembles *sinigrin*, and on hydrolysis it yields a volatile pungent body with an odour like oil of mustard.[1] An alkaloid, *carpine*, $C_{14}H_{25}O_2N$, has been isolated from the leaf; it has a digitalis-like action.[1, 2] The leaf has been recommended for the treatment of bots in horses, but Steyn [3] found that it produced no benefit. He found also that it is harmless when fed to rabbits and horses. Bischoff, Long, and Sahyum [4] find that the fruit has no hypoglycaemic action when given to a rabbit by the mouth. Their investigation was undertaken because a diabetic patient found apparent clinical benefit from eating the fruit.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1417.
2. A. Tschirch: Handbuch der Pharmakognosie, 1917, ii (2), 1549.
3. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 781.
4. F. Bischoff, M. L. Long, and M. Sahyum: J. Pharm. Exp. Therap., 1929, xxxvi, 311.
5. H. W. Hofstede: Pharm. Tijdschr. Ned. Ind., 1929, through Qtly. J. Pharm. and Pharmacol., 1930, iii, 103.

LXXXIII. BEGONIACEAE

An infusion of the leaf and stem of **Begonia sutherlandii Hook.,** Zulu *uQamamawene*, is a Zulu emetic used in heartburn and haematemesis. The Zulus also use an infusion of the root of *Begonia sp.* as an emetic for diseases of the chest, and as a purgative enema.

LXXXIV. CACTACEAE

The Oorlams apply slices of **Echinocactus oxygonus Link. and Otto.,** Cactus, Vingerhoedbolle, from which the skin and thorns have been removed, to burns, scalds, and ulcers. It is said to have a soothing effect and to draw the lymph from blisters.

Prickly pear, which may be **Opuntia decumana Haw.,** Kaalblad, Turksvy, **Opuntia tuna Mill.** or **Opuntia vulgaris Mill.,** Barberry fig, Indian fig, is used

medicinally. Europeans and Natives very commonly apply a poultice of the " leaf " to various painful conditions, to ulcers, and to sores and boils. In the Transvaal, a European remedy for whooping-cough is made by boiling the leaf pulp with water for half an hour, straining off the resulting liquid, which is then boiled with sugar. The dose is a teaspoonful to a dessertspoonful according to age. The fruit is thought to be astringent,[1] which may be the case, for they are constipating. When eaten to excess, the fruit seeds have caused obstruction of the bowel from impaction. The " leaves " are used as a stock food in dry parts of the country, and are fed by removing the spines and chopping up. They are of considerable value during drought, on account of the high percentage of water which they contain. In Australia the " leaves " are minced, covered with sodium bicarbonate, and allowed to stand overnight. A black treacly liquid exudes, which is given as a diabetes remedy. It is said to be of some value in mild cases, but is neither a cure nor can the patient take dietetic liberties. The species of Opuntia used for this purpose is not known, and may differ from the South African species. The " leaf " of **Opuntia tuna Mill.** contains *calcium oxalate* and *malate*,[2] and the fruit of **Opuntia vulgaris Mill.** has been analysed.[3] The " leaf " slime of **Opuntia vulgaris Mill.** contains *arabin* and *galactin*, and resembles *acacia* and *tragacanth gums* in its properties.[4] Natives make a beer from prickly pear fruit.

The Tongas use the latex of a small **Cactus sp.,** Tonga *mudleve*, as a dressing to extract thorns from the feet, and in the treatment of dysenteries (Stevenson-Hamilton).

REFERENCES

1. G. A. Turner: Transvaal Med. J., 1908-09, iv, 202.
2. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 12.
3. Amer. J. Pharm., 1884, 3, and 1896, 170, through United States Dispensatory.
4. V. Horlay: J. Pharm. Chim. [6], xvi, 193, through Chem. Cent., 1902, ii, 1264.

LXXXV. THYMELAEACEAE

Peddiea africana Harv., Sterkbas, Sterkbos, Gashuana, *isiFufufu*, is said to be used medicinally and homicidally by natives. A feeding experiment with a bovine and drenching a sheep with 100 grm. of the dried plant in the flowering stage produced no effects.[1]

The Lambas, Lenges, and Limas apply the chewed leaf of **Gnidia (=Lasiosiphon kraussii Meisn.)**, Suto *thopa*, Lamba *kaLunga-mbewa*, to burns. The Sutos regard the plant as very poisonous, and use a decoction to bathe wounds and bruises (Phillips). Medley Wood states that the Zulus use it as a snake-bite remedy and in sore throats—in the latter case, because it has mild blistering properties. The plant is exceedingly poisonous and rapidly fatal to stock.[2]

The Sutos inhale the smoke from burning **Gnidia (=Lasiosiphon anthylloides Meisn.)**, Suto *moomang*, Zulu *inDolo*, in fever and for " bad dreams." They also drink a decoction of the root for coughs and influenza. The Zulus formerly used the root as a snake-bite remedy.[3] Smith states that the Xosas used the

root medicinally, and that when chewed it produces a burning sensation in the mouth and throat. Pammel quotes Greshoff as stating that the plant is poisonous. Alexander,[4] by feeding experiments, found that the plant in the flowering stage is highly toxic to sheep, cattle, and horses. Ingestion of 4 oz. by sheep and 12 oz. by cattle and horses produces death so rapidly that no symptoms, apart from acute abdominal pain, are observed. Smaller amounts kill more slowly, with the symptoms and *post-mortem* signs of acute gastro-enteritis, frequently haemorrhagic. These animals sometimes have pyrexia, resembling an acute bacterial infection, which is ascribed to general intoxication as a result of the inflammatory changes in the intestine. The assistants who prepared the material for Alexander's experiments suffered from marked irritation in the mouth, nose, and pharynx, with persistent coughing and sneezing, and subsequent headache and nausea.

The Sutos use **Gnidia (=Lasiosiphon linifolius Dcne.),** Koorsbossie, Suto *mofubetswana, thopana, thopa-e-nyenyane, setele,* Kxatla *mathloxole,* in a variety of ways. They poultice the jaw with the plant to relieve toothache, and use it as one of their remedies for fractures and sprains. They take a decoction of the root as an emetic in anthrax and as an enema to relieve backache. They also use the plant as a snuff to relieve headache (Phillips). The Gaikas and Xosas use the root for sore throat, either by chewing it or as a decoction (Smith). The Kxatlas drink a root decoction for burns, and the Shangaans smoke the dried leaves to relieve headache. The Sutos regard the plant as non-poisonous, but Smith states that the root is hot when chewed. Steyn [1] states that the plant has been suspected of causing deaths among cattle, but that a rabbit drenched with 30 grm. of fresh flowering material showed no untoward effects. He records this under the name **Gnidia capitata L. f.**

The Kxatlas and Kwenas inhale the smoke from burning a **Gnidia sp.,** Kxatla and Kwena *sesweu,* for diseases of the eyes. They also drink an infusion for the same purpose.

Lasiosiphon meisnerianus Endl., Xosa *isiDikili,* is used by the Xosas as a " blood purifier " for skin eruptions and sores. Smith states that the root is hot when chewed, and is used by the Xosas as a snake-bite remedy, usually in the form of an infusion of the leaf or root. They also use the plant in treating " Karroo fever," and either a paste of the leaf or an ointment of the powdered root as a dressing for sores. For toothache they insert the powdered root into the tooth cavity. The plant is sometimes simply chewed for the same purpose. According to Hewat, natives use an infusion of the root in the treatment of malaria and a decoction of the plant for respiratory diseases, and apply the juice to indolent and callous ulcers. A decoction of the root and a tincture have been used as a remedy for disease in sheep.[5] Marloth states that the plant contains a pungent principle. Rogerson [6] has isolated from the bark 12·3 per cent. of a brown irritant *resin, tannin,* and *sugars.* No alkaloids or glucosides were found.

The Sutos chew a small piece of the root of **Gnidia (=Arthrosolen polycephalus C. A. Mey.),** Januariebossie, to relieve asthma. Rindl [7] states that a decoction is used as a remedy for lamsiekte, and that the root is exceedingly bitter. He isolated from the root *daphnin,*[7] which is a glucoside.[8]

Robertson [9] records that an **Arthrosolen sp.**, January bush (which is probably **Arthrosolen polycephalus C. A. Mey.**), proved toxic to oxen, causing death from acute gastritis. Curson [10] makes a similar note. Steyn,[1] on the other hand, found feeding tests in rabbits and sheep negative. He states that farmers believe the plant to be poisonous.

Hutchence [11] reports that **Gnidia ovalifolia Meisn.** was suspected of causing loss of cattle in East Griqualand in 1904. He, however, could not prevail on them to eat the plant even after forty hours' starvation. Feeding experiments proved the plant to be toxic. One pound weight of leaf daily for three days resulted in frothing at the mouth, dullness, absence of rumination, and pyrexia. Persistence with the feeding caused the development of a diarrhoea, which became progressively worse, until the beast was weak in the hind-quarters and had complete anorexia. Ultimately, the animal was unable to rise, and developed a mucous discharge from the eyes, nostrils, and vagina. One pound daily for thirteen days and 5 lbs. of leaf and bark on the fourteenth day caused the animal to die on the fifteenth day. *Post mortem*, there was found acute gastro-enteritis, acute hyperaemia of the fourth stomach and intestines, no ulceration, and congestion of the kidneys.

The Sutos smoke the leaf of **Arthrosolen gymnostachys C. A. Mey.**, Suto *thopananyana*, *tsika-mangotswana*, to relieve headache.

The Kwenas and Chuanas take teaspoonful doses of the powdered root of a **Gnidia sp.**, Kwena and Chuana *maxorule*, as a drastic purgative. The Zulus and Swazis drink a decoction made from the root-bark of a **Gnidia sp.**, Zulu and Swazi *isiLengo*, as a " blood purifier " and for boils. A species of **Gnidia,** Asmabossie, is used by Europeans and Fingos as an asthma and phthisis remedy. An infusion is drunk in large quantities on an empty stomach in the morning, and produces emesis. A **Gnidia sp.** is used by the Sutos: the woody part of the root as a local application to painful hollow teeth, the same material smoked to relieve cough and general pains, and inhalation of the smoke from burning root to relieve headache. According to Bryant, the Zulus apply a root-paste of a **Lasiosiphon sp.**, Zulu *isiDikili*, over the body in eruptive fevers. They apply the powdered burnt root in ophthalmia and use a decoction of the root of several **spp. Lasiosiphon** as a snake-bite remedy. Bryant states that the root is hot to the taste.

The Karangas of Southern Rhodesia administer an infusion of the root of **Synaptolepis sp.**, *cf.* **Synaptolepis kirkii Oliv.**, Karanga *mutsuri*, for epilepsy. It produces emesis.

The Hottentots drink a decoction of **Passerina filiformis L.**, Bakbos, Bruinganna, Gannabas, Kannabos, Fyne-taaibos, Kaalgaar (Kabelgaren), Windmakerbos, Hottentot *p/tou*, for shooting pains (Laidler). **Passerina ericoides L.**, Suto *lehapu*, *lekxapu*, is probably used medicinally by the Sutos (Phillips).

REFERENCES

1. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 800, 801.
2. Bull. Imp. Inst., 1910, viii, 385.
3. J. Medley Wood: Pharm. J., 1894, 275.
4. R. Alexander: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 233.

5. J. F. Soga: Rpt. of the Colonial Vet. Surg. for the Year ending 31st December 1895, Cape of Good Hope, G. 41—1896, 31.
6. H. Rogerson: Amer. J. Pharm., 1911, lxxxiii, 49, through Chem. Abs., 1911, v, 1157.
7. M. Rindl: Trans. Roy. Soc. So. Afr., 1917, vi, 295.
8. M. Rindl: Private communication to J. M. Watt.
9. W. Robertson: Rpts. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Year ending 31st December 1905, Cape of Good Hope, G. 47—1906, 63.
10. H. H. Curson: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 207.
11. M. A. Hutchence: Rpts. of the Chief Vet. Surg. and Assist. Vet. Surgeons for the Six Months ended 31st December 1904, Cape of Good Hope, G. 60—1905, 7-8.

LXXXVI. LYTRACEAE

A decoction of **Nesea sagittaefolia Kochne,** Suto *kxamane,* is taken by natives for blackwater fever and other haematurias.

LXXXVII. PUNICACEAE

Europeans use the rind of the fruit and the root of **Punica granatum L.,** Pomegranate, Iralnate, Granaat, Granaatappel, medicinally. A decoction of the dried rind of the fruit is drunk for the relief of stomach-ache and in dysentery, while an infusion of the same material is taken for colitis. These preparations are said to be intensely bitter. Wicht states that an infusion of the powdered fruit rind and rice flour is used in diarrhoeas and dysenteries, and as an anthelmintic. Pijper mentions the use of the powdered fruit rind for the treatment of dysenteries in the Transvaal, and the use of a decoction of same as an anthelmintic. A decoction of the root is used for tape-worm in children. Pappe, in addition to mentioning the use of a decoction of the rind and root in diarrhoea, states that an infusion was used by the early colonists as an injection for leucorrhoea. The fruit rind contains a large amount of *tannin.*[1] The flowers also contain tannin, and were used by the ancients in dyeing.[1] They have a bitterish astringent taste and, when eaten, impart a violet-red colour to the saliva.[1] The bark of the stem and root contains a large amount of tannin and a series of related alkaloids, of which the most important is *pelletierine.* These alkaloids are anthelmintic.

REFERENCE

1. United States Dispensatory, 1926, 21st Edition, 534.

LXXXVIII. RHIZOPHORACEAE

The bark of **Ceriops candolleana Arn.,** known by natives in Tanganyika as *mkandaa, mkoko mkandaa, mkoko,* and *mkandala,* yields from 13·23 to 42·3 per cent. of *tannin,*[1, 2, 3] and a red dye.[1]

All parts of the trees **Rhizophora mucronata Lam.** and **Bruguiera gymnorrhiza Lam.,** both known as Red mangrove, contain *tannin.* The bark of Rhizophora mucronata yields from 4 to 47·99 per cent., and that of Bruguiera

gymnorrhiza from 12·77 to 53·12 per cent.[1, 2, 3, 4] The percentage of tannin varies according to the district in which the tree grows. Both barks are used in tanning.[1, 4] The former contains a red dye, the latter red-brown.

Anisophyllea sp., *majunji* (Northern Rhodesia), is suspected of having caused the death of a native in Northern Rhodesia.

REFERENCES

1. W. Busse: Arb. Kais. Ges.-A. xv, 177, through Chem. Cent., 1899, i, 315.
2. Imperial Institute: Tech. Rpts. and Scient. Papers, 1899, Part I, 186.
3. Bull. Imp. Inst., 1905, iii, 346.
4. Bull. Imp. Inst., 1927, xxv, 270.

LXXXIX. COMBRETACEAE

The Lambas use the fresh leaf or moistened dry leaf of **Combretum guenzii Sond.,** Lamba *umuLama*, as a dressing for wounds. The powdered decorticated root is used for the same purpose.

The Zulus regard **Combretum erythrophyllum Sond.,** Bush willow, Rooiblaar, Rooibos, Vaderlanswilge, Zulu *umDubu*, Thlaping *mokhukhu*, as poisonous, but give small doses of the root to dogs as a fattening tonic. The root is purgative. Pammel quotes Greshoff as stating that the plant is poisonous.

For abdominal disorders the Zulus use the leaf of **Combretum apiculatum Sond.,** Bush willow, Zulu *umBondo*, as a steam bath by boiling it in water or as an enema in the form of a decoction. **Combretum bracteosum (Hochst.) Brandis,** Hiccup-nut, is used medicinally, apparently for the relief of hiccough. Pammel quotes Greshoff as stating that it is toxic and contains *saponin*. **Combretum phaneropetalum Bak.** is also said to be toxic (Pammel).

The root of **Combretum glomeruliflorum Sond.,** Venda *mugwiti*, is used by the Vendas as an aphrodisiac. They also apply the root of **Combretum microphyllum Klotzsch.,** Venda *gopokopo*, in cases of retained placenta, which it is said to rot.

The Xosas use a decoction of the wood of a **Combretum sp.,** Xosa *umDubi*, as a purgative.

A decoction of the root of **Terminalia sericea Burch.,** Yellow wood, Geelhout, Vaalboom, Chuana *mohonono*, Tonga *mugosi*, Kxatla *moxônônô*, Thonga *nkonono*, is bitter, and is drunk by the Chuanas, Subias, and Kobas to stop purging. The Kxatlas of Bechuanaland administer a decoction of the root to cows suffering from protracted parturition or retained placenta (Schapera). The Thongas use the plant in the treatment of dysenteries and hydrocele (de Almeida).

XC. MYRTACEAE

An infusion of the bark of **Eugenia gerrardi Sim** *ex deser.*, Zulu *umDoni*, is drunk by the Zulus in the treatment of tuberculosis of the lungs and other chronic chest complaints. The preparation is said to ease pain and cough. The fruit is edible.

An infusion of the leaf of **Eucalyptus globulus Labil.,** Blue gum, Blougom, Bloekom, is used as a spray for vermin-infested places, and is said to dislodge them effectively (Wicht). Steam from water, in which the leaves are boiling, is inhaled as a respiratory antiseptic (Wicht). Smith recommends a lightly boiled decoction or an infusion of the bruised leaves for the treatment of influenza, and also mentions the inhalation treatment. In the Transvaal, Europeans apply a poultice of the bruised leaves to draw abscesses to a head (Pijper). Frequently the leaves are worn in the hat and placed about residences as a prophylactic against influenza. The fresh leaf contains 2·75 per cent. of a volatile oil, *oil of eucalyptus.*[1] This is rich in *eucalyptol (cineol),*[1, 2] the percentage being sometimes as high as 83·7.[2] The volatile oil also contains *pinene, eudesmol, globulol,* and *aldehydes* of *butyric, capronic,* and *isovaleric acids.*[1] Leaf preparations appear to be slightly astringent, but the action is due to the volatile oil, which has the usual carminative effects of this group of oils, but has probably a greater degree of antiseptic action than most of them.[1] An infusion of the leaf has been used in diabetes, but careful tests on twenty patients proved negative.[1] Among the very poor of South Africa, both European and Native, the finely powdered bark is employed as a dusting powder. In the Argentine a variety of *kino* is obtained from the tree. This contains 28·67 per cent. of *kino-tannin* and 47·89 per cent. of *catechin.*[2] We are informed by a native herbalist that the root is purgative.

Eucalyptus maideni F. v. M., and **Eucalyptus sideroxylon A. Gunn,** like **Eucalyptus globulus Labil.,** have been introduced into South Africa. Eucalyptus oil from all three species produced in South Africa has been found to satisfy the standards of the British Pharmacopoeia and to compare well with similar oil from other countries. The *cineol* content is as follows: Oil of Eucalyptus globulus, 69 per cent.; oil of Eucalyptus maideni, 83 per cent.; and oil of Eucalyptus sideroxylon, 78 per cent.[3] Constants of South African eucalyptus oil are given in reference No. 3.

Melaleuca leucadendron L., Cajuput tree, Punk tree, Swamp tea tree, is the source of the well-known *oil of cajuput.* Wicht says that the oil is used as ear-drops to relieve earache. He says the action is irritant, and ultimately anaesthetic. The oil has the usual actions of a volatile oil, and is an excellent mosquito repellent. It has the advantage over oil of citronella of volatilising more slowly.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 444.
2. A. Tschirch: Handbuch der Pharmakognosie, 1917-25, ii, 2, 1037; iii, 1, 65.
3. Bull. Imp. Inst., 1931, xxix, 126.

XCI. MELASTOMATACEAE

The Zulus take an infusion of the root, stem, and leaf of **Dissotis incana Naud.,** Zulu *imFe-yesele, imFe-yenkala,* to prevent the development of certain unpleasant symptoms which sometimes arise from drinking beer made from new season's mealies. According to Bryant, they use an infusion of the leaf as an enema in diarrhoeas and dysenteries.

XCII. ONAGRACEAE

According to Phillips, the Sutos dip a thread in the sap of **Epilobium hirsutum L.,** Willow herb, Suto *nôha, letswai-la-badisana, mosika-nokana,* and pass it through warts to cause them to disappear. Pappe states that **Epilobium villosum Thunb.,** Willow herb, was renowned as a remedy for cleansing foul ulcers.[1]

REFERENCE

1. James Bowie: So. Afr. Qtly. J., 1830, i, 29.

XCIII. HALORRHAGIDACEAE

A decoction of the root of **Gunnera perpensa L.,** River pumpkin, Wilde-ramenas, Suto *qobo,* Xosa *iPhuzi-lomlambo,* Zulu *uGobo,* is given by Europeans and Zulus to animals to assist in the expulsion of the placenta. It is sometimes given to women for the same purpose. According to Bryant, the Zulus also administer the herb, along with the bulb of a **Crinum sp.,** to facilitate delivery of the child or to initiate labour when it is retarded, in dysuria, and to relieve the pains of rheumatism. The Sutos use the plant for the expulsion of the placenta and, according to Phillips, a root decoction as a colic remedy, especially in pregnant women. The Xosas use a root decoction, with the leaf of **Clematis brachiata Thunb.,** as a drench for bots in horses (Smith). Hewat states that an infusion of the root is used, externally and internally, by natives for psoriasis. Pappe records that the Cape farmers formerly took a decoction of the root as a tonic in dyspepsia and a tincture for gravel, and Ecklon,[1] that they used the root as a stomachic. A sheep drenched with 700 grm. of fresh root showed no symptoms.[2]

REFERENCES

1. C. F. Ecklon: So. Afr. Qtly. J., 1830, iv, 368.
2. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 793.

XCIV. ARALIACEAE

According to Wicht, Europeans in South Africa apply the leaf of Ivy, **Hedera helix L.,** steeped in vinegar, to corns and cancerous growths. In Europe it has been used as a dressing for ulcers and other skin conditions.[2] Ivy gum, which is a *resinous exudate* from the stems of old ivy plants, has been used in medicine as a stimulant and emmenagogue, and is stated to relieve toothache if placed in hollow teeth.[2] Its chief constituent is *resin* and some *bassorin.*[2] The berry has an acidulous, resinous, and somewhat pungent taste, and is said to be purgative and emetic.[2] The fresh leaf has a balsamic odour and a bitterish, harsh, unpleasant taste. This apparently precludes stock from eating it.

Moore [3] isolated from the leaf a sapo-glucoside, *hederin,* $C_{32}H_{52}O_{10}$, which

is intensely haemolytic. It produces little effect when given by the mouth, but is irritant to mucous surfaces. Intravenously, hederin is toxic in small doses, causing death by respiratory paralysis. Low dilutions produce vasodilatation, high vasoconstriction. Hederin slows the heart and increases its tonus.

The Zulus use, as an emetic in biliousness, an infusion of the decorticated bulbous thickening at the base of the fruit stem of **Cussonia spicata Thunb.**, Cabbage tree, Kiepersol, Sambreelboom, Samareelboom, Waaiboom, Nooiensboom, Noiensboom, Xosa and Zulu *umSenge*. An infusion of the root may be used in the same way. The Xosas chew underground portions of the root like sweet cane, but we are informed that the above-ground root is bitter. A sheep drenched with 200 grm. of the leaf showed no symptoms, the test being made because the plant was suspected of causing toxic effects in cattle.[1]

The Sutos administer a decoction of the leaf of **Cussonia paniculata E. and Z.**, Cabbage tree, Suto *mothsêthsê*, Pedi *mothšôthšê*, and other plants in the treatment of incipient and early nervous and mental diseases. Phillips states that they use the plant as an enema to rid the intestine of parasites, and with other plants as a remedy for colic and painful menstruation. The Pedis use the stem alone or with other materials by throwing it on live coals and smoking rheumatic patients under a blanket (Stevenson-Hamilton).

The Kxatlas and Kwenas drink a decoction of the stem and root of a **Cussonia sp.**, Kxatla and Kwena *mosethse*, for painful menstruation.

REFERENCES

1. D. G. Steyn: (1) 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 778; (2) 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, ii, 712.
2. United States Dispensatory, 1926, 21st Edition, 1327.
3. B. Moore: J. Pharm. Exp. Therap., 1912-13, iv, 263.

XCV. UMBELLIFERAE

The juice of **Hydrocotyle bonariensis Lam.**, Perdekloutjies, is used as a gargle for sore throat and thrush.

According to Pappe, **Hydrocotyle asiatica L.**, Pennywort, Varkoortjies, Waternavel, Suto *bodila-ba-dinku*, was used during last century in India in the treatment of leprosy. Pammel states that the plant is narcotic.

Pappe states that the root and stem of **Centella glabrata L.** (Hydrocotyle centella Cham.), Persgras, were used as a decoction by the Cape farmers for violent diarrhoea and in chronic dysentery.

The Xosas and Fingos eat the leaf of a **Hydrocotyle sp.**, Xosa and Fingo *iNyonqwana*, as a vegetable to " purify the blood."

Wicht states that the leaf of **Hermas gigantea L. f.**, Tondelblaar, is applied as a dressing to wounds. He is of the opinion that it acts like oiled silk by preventing evaporation.

The Zulus use an infusion of the root of **Alepidea amatymbica E. and Z.**, Kalmoes, Xosa *iQwila*, *iQwili*, Suto *lesooko*, *lesoko*, Zulu and Swazi *iKhathaza*, as an enema for children with coryza or cough. The powdered root is used

as a snuff and the fumes from burning it inhaled for the same purpose. The stem is hollow, and the steam which issues from one end when the other is burnt is likewise inhaled. The Transvaal Zulus and Swazis drink a decoction of the root in influenza. The Sutos chew the root for chest diseases and, according to Phillips, sometimes take a decoction instead. The Xosas at one time used the plant in abdominal disorders. Smith states that the root is resinous and bitter, and has a peculiar, strong odour. He states the Xosas used it, powdered, as an infusion or as a tincture, for pains in the stomach and abdomen—large doses as a purgative; small, as a tonic. In the Transvaal, Europeans apply the bruised plant to wounds as a styptic.

The Sutos take a decoction of the root of **Alepidea ciliaris la Roche.,** Bergkalmoes, Suto *lesokwana*, Xosa *umHlaba*, for cough, colds, and chest complaints. The raw root is sometimes chewed for the same purpose (Phillips). The Xosas use the plant as a remedy for abdominal disorders, and Smith records that they use it as a cattle medicine. Natives all over the country use the root decoction for stomach complaints and rheumatism. It is said to cause purging.

The Sutos either chew the raw root of **Alepidea setifera N. E. Br.,** Suto *lesokwana*, or drink a decoction of it for chest complaints (Phillips).

A decoction of the root of **Alepidea longifolia E. Mey.,** Zulu *i Khokhane*, is taken by the Zulus for cough. They use the boiled leaves as a vegetable.

A decoction of the root of **Arctopus echinatus L.,** Pox thorn, Pokkiesdoring, Platdoring, Sieketroos, is used by Europeans with saltpetre as a remedy for epilepsy. It is said to cause sleepiness. Natives use an infusion of the plant, internally and locally, in the treatment of venereal diseases, and the Hottentots, Xosas, and Europeans the root, in decoction, infusion, or tincture, as a " blood purifier " (venereal disease (?)). The plant seems to have been used since very early times by the European settlers for both syphilis and gonorrhoea. Pappe considers that the remedy was taken from the Hottentots, and states that it is demulcent and diuretic, usually given as a decoction of the root. Thunberg notes that it contains a " very white pure *gum*," and mentions the use of the decoction for venereal diseases. Wicht records that it is greatly used in gonorrhoea, and contains an aromatic *balsam*. Pappe, on the other hand, states that it contains " a sort of *resin* " and an *alkaloid*, the sulphate of which consists of small scaly white crystals which are astringent. The root yields *sucrose*, a *resin*, and a *glucoside*.[1]

The Sutos make a lotion from **Anthriscus sylvestris Hoffm.,** Suto *lefokodi-le-leholo, lefokodi-la-dinoka*, which is used as a refreshing bath when feeling tired or unwell (Phillips). They also use a lotion made from **Conium chaerophylloides Thunb.,** Suto *lefokodi*, to wash feverish patients.

Pijper states that, in the Transvaal, Europeans apply bruised **Lichtensteinia lacera Cham. and Schlecht.,** Kalmoes, as a styptic to wounds.

Smith states that **Lichtensteinia pyrethifolia Cham. and Schltr.** (Lichtensteinia interrupta E. Mey.), Xosa *umBungashe*, Suto *tloro-ya-ngwale*, Zulu *inTlashane*, had a considerable reputation among the Xosas and Sutos as a remedy for colds. A milk decoction of the root was the form usually taken. He mentions that it causes headache. Smith, elsewhere, mentions that the

plant is used in fevers (probably malarial) and in catarrh. The Zulus take a decoction of the root for chronic cough of any kind (Bryant). According to Hewat, the plant is a favourite native remedy for bronchitis, consumption, and other respiratory diseases.

Marloth records that the root of **Ruthea gummifera (L.) Bolle,** Gli, Moerwortel, was employed by the Hottentots in preparing an intoxicating beverage.

Heteromorpha arborescens Cham. and Schlecht., Zulu and Xosa *um Bangandhlala,* Suto *monkxwane, maka-tlala,* is widely used among natives. The Zulus employ an infusion of the leaf as an enema for abdominal disorders generally. The Sutos administer a decoction of the leaf in incipient and early nervous and mental diseases, and, according to Phillips, a preparation of the leaf to children with intestinal worms. They inhale the smoke from burning the plant to relieve headache, and give a decoction of the root or of the bark to infants who have the fontanelle depressed as a result of disease. The Xosas use a decoction of the decorticated root for shortness of breath, cough, dysenteries, and scrofula, and for thread-worms in horses. Smith mentions that they employ a tincture or an infusion of the inner bark of the tree or of the root-bark in colic. He states that the plant is a " blood purifier."

A decoction of the seed of **Apium graveolens L.,** Celery, Seldery, Selery, is said to relieve lumbago and rheumatism when taken by the mouth, and the raw seed is sometimes eaten for the same purpose. Its utility is doubtful. Pammel states that, in the wild state, the plant is somewhat poisonous, and is irritant. The seed yields a *volatile oil,* with the characteristic odour of the plant. It consists chiefly of *terpenes,* but the odour seems to be due to *sedanolid,* $C_{12}H_{18}O_2$, the lactone of *sedanolic acid,* and *sedanonic anhydride,* $C_{12}H_{18}O_3$.[2]

Wicht states that **Carum capense Sond.,** Vinkelwortel, is heated and applied externally to relieve pain. It is not used internally as a medicine but is eaten as a food.

The Zulus take an infusion of **Pimpinella sp.,** Zulu *i Beka,* as an emetic before going out courting.

Pappe mentions that the root of **Sium thunbergii DC.,** Water parsnip, Tandpynwortel, Suto *lekxapi, lehlatso, qaqawe,* was renowned among the early Cape colonists as a toothache remedy, the root being either held in the mouth or chewed. The Sutos wash the body with a decoction of the plant for the relief of headache.

Sium thunbergii is suspected of being one of the factors in producing vlei-poisoning in cattle, a condition affecting the nervous system.[3] In acute cases there is loss of appetite and marked nervous symptoms, varying from mania to coma. Death occurs within a few hours. Ordinarily the animal, after a period of dullness, becomes hyperaesthetic, the pupils are dilated, and there is paresis of the tongue and cheeks, which is progressive, so that the animal ultimately is unable to prehend, masticate, and even sometimes to drink. There is marked salivation. The animal has difficulty in walking, seems to lack intelligence, and shows muscular twitchings and exaggerated reflexes. Other animals show complete anorexia, extreme dullness, and uncertain gait

when forced to move. Later, convulsions or rhythmic contractions of the muscles are seen. As before, paresis of the lips, cheeks, and tongue prevents normal eating and drinking. The pupils are dilated, and finally the animal becomes hyperaesthetic. As in the previous group, salivation is prominent. In very mild cases there is anorexia, loss of milk, and definite nervous symptoms (Neser [3]).

Although it seems likely that this disease arises from the ingestion of a toxic plant or plants, there is no proof, so far, that Sium thunbergii is one of the causative agents. The plant, though not always toxic, has been shown to be poisonous to cattle, particularly in the spring and on certain soils.[3, 4, 5]

Bowie [10] states that **Oenanthe sp.,** Gli, is intoxicating, and that the whole genus is acrid and poisonous but possesses useful medicinal properties.

Peucedanum galbanum Bth. and Hook (Bubon galbanum L.), Wild celery, Blistering bush, Selery, Wilde-selery, Berg-selery, is taken as an abortifacient, and blisters the skin on contact. An infusion is used among Europeans by the mouth, as a douche and by local steaming, as a remedy for miscarriages, and to aid in the expulsion of retained placenta. It is also given to cows for the latter condition. In some parts of the country the infusion is used along with **Mentha longifolia Huds.** and **Pelargonium grossularioides Ait.** for suppression of the menses, and with **Diosma vulgaris Schlecht.** as a diuretic in dropsy and renal diseases. The infusion of Peucedanum galbanum may be used alone for the latter. Guillemard [6] states that the infusion is certainly diuretic, and particularly efficient in hepatic dropsy. Wicht mentions that the infusion is diaphoretic, and that the plant produces dermatitis, and blisters forty to fifty hours after coming in contact with the bare skin. The leaf yields a light brown *volatile oil* with a strong aromatic, characteristic odour.[7] It was thought that the blistering property of the leaf was due to this oil, but Gunn and Geiling [8] state that though it has a nauseating taste, it is not particularly irritating to the mucosae of the mouth and stomach, and produces no irritation when rubbed on to the skin. They think, therefore, that the irritant property of the plant is not due to the volatile oil but to some non-volatile constituent. The oil produces the usual inhibitory effects of volatile oils on the movements of unstriped muscle. A fairly high concentration, perfused through the isolated mammalian heart, depresses its activity. Like most volatile oils, it is somewhat diuretic. The leaf and stem of the plant contains an alkaloid, *hesperidine*,[9] but we do not know the significance, if any, of this.

Wicht states that **Peucedanum tenuifolium Thunb.,** Wild parsley, Wilde-piterselie, is used medicinally, and apparently blisters like Peucedanum galbanum. According to Marloth, **Peucedanum capense (Thunb.) Sond.,** Lidbossie, is used medicinally. The Fingos add a decoction of the root of **Peucedanum magaliesmontanum Harv.** to baths for refreshing the body.

Europeans use a decoction of the common carrot, **Daucus carota L.,** for infantile diarrhoea. In Europe it is used as an anthelmintic, and scrapings as a local application to ulcers. The fruit has an aromatic odour and a warm, pungent, and bitterish taste, and yields by distillation 1·26 per cent. of a *volatile oil.*[2] The seed is slightly aromatic, moderately excitant and diuretic,

and has been used as a diuretic in dropsy and renal disease.[2] As much as an ounce, in infusion, may be given in twenty-four hours.[2] The flower may be substituted for the seed.[2] The leaf yields two liquid alkaloids, *pyrrolidine*, $(CH_2)_4NH$, and *daucine*, $C_{11}H_{18}N_2$.[2] Pammel states that the leaf is vesicant and that persons handling the plant are often poisoned, especially when it is wet with dew.

REFERENCES

1. M. Rindl: Private communication to J. M. Watt.
2. United States Dispensatory, 1926, 21st Edition, 153, 1244.
3. C. P. Neser: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 805.
4. A. O. D. Mogg: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 815.
5. A. O. D. Mogg: So. Afr. J. Sci., 1927, xxiv, 269.
6. R. J. Guillemard: So. Afr. Med. Record, 1912, x, 428.
7. W. J. Copenhagen: Quoted by Juritz, Chem. News, 1923, cxxvi, 67.
8. J. W. C. Gunn and E. M. K. Geiling: So. Afr. Med. Record, 1920, xviii, 288.
9. H. Nilsson: Svensk. Farm. Tid., 1921, xxv, 233, through Chem. Abs., 1921, xv, 2694.
10. James Bowie: So. Afr. Qtly. J., 1830, i, 30.

XCVI. CORNACEAE

Juritz [1] obtained 2·98 to 14·05 per cent. of *tannin* from the bark and 4 per cent. from the twigs and leaves of **Curtisia faginea Ait.**, Assegai wood, Asgaaihout, Xosa *um Hlebe*.

REFERENCE

1. C. F. Juritz: Rpt. Joint Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

XCVII. MYRSINACEAE

The Zulus use an infusion of the decorticated root of **Maesa rupescens DC.**, Zulu *uHlamvubele*, Zulu and Xosa *isiThende*, as an emetic in biliousness, and the powdered fruit in water as an anthelmintic in man and animal. In some parts the Zulus and Xosas use the seed as an anthelmintic; it is said to produce a burning sensation in the throat.

According to Bryant, the Zulus use the ripe fruit of a **Maesa sp.**, Zulu *uMaguqu*, for round- and thread-worms, and the fruit and leaf of **Embelia kraussii Harv.**, Zulu *iBhinini*, as an anthelmintic.

The Sutos administer **Myrsine africana L.**, Suto *thakxisa*, *morokwana-pheleu*, Chuana and Kwena *thlare-sa-madi*, to rams to prevent their covering the ewes before the proper time (Phillips). The Chuanas and Kwenas use a decoction of the leaf as a "blood purifier" (syphilis (?)). The seed sometimes occurs as an adulterant of powdered pepper.[1, 2] The fruit has been used as a tape-worm remedy, but not in South Africa.

The bark of **Myrsine melanophleos R. Br.**, Cape beech, Wit beukehout, Boekenhout, Swartbas, Zulu *isiQulabahlathi*, contains 15·96 per cent. of *tannin*.[3]

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 857.
2. A. Tschirch: Handbuch der Pharmakognosie, iii (1), 4, 26, 179.
3. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

XCVIII. PRIMULACEAE

Anagallis arvenis L., Pimpernel, Scarlet pimpernel, Poor man's weather-glass, Shepherd's weather-glass, Rooimuur, is an introduced species which is not used medicinally in South Africa. It has a bitterish and somewhat acrid taste, and is poisonous, producing gastro-enteritis in the dog and horse.[1] It is used in other parts of the world as an application to ulcers and for various internal diseases.[2] Heintzelman [2] isolated from it a pungent, acrid, *volatile oil* with a peculiar odour. By the mouth, this produces intense headache and nausea, lasting for twenty-four hours, and accompanied by pains throughout the body. Combes,[3] Schneegans,[4] and Kobert have isolated *saponins* from the herb. Daccomo and Tommasoli [5] state that the plant contains a *proteolytic ferment*, but this is denied by Bufalini.[6] The root contains a saponin, *cyclamin*.[7] Cyclamin, isolated from **Cyclamen europaeum L.,** is highly toxic,[8] so that it is very probable that Anagallis cyclamin is also poisonous. Pammel gives the formula, $C_{25}H_{42}O_{12}$, to cyclamin.

REFERENCES

1. M. Orfila: Traité des Poisons, 3rd Edition, 1826, ii, 331.
2. United States Dispensatory, 1926, 21st Edition, 1200.
3. —. Combes: Compt. Rend., 1907, cxlv, 1431, through ref. No. 7.
4. —. Schneegans: Pharm. Zeit. f. Russl., 1891, 534, through ref. No. 7.
5. —. Daccomo and —. Tommasoli: Ann. Chim. Farmac., 1892, xvi, 20, through ref. No. 7.
6. G. Bufalini: Arch. Farmacol., viii, 433, through Chem. Abs., 1910, iv, 3242.
7. C. Wehmer: Die Pflanzenstoffe, 1911, 191, 579.
8. A. R. Cushny: Pharmacology and Therapeutics, 1924, 8th Edition, 455.

XCIX. PLUMBAGINACEAE

The Xosas use the powdered root of **Plumbago capensis Thunb.,** Plumbago, Cape lead wort, Xosa *uMatshintshine*, *umThiwa-amadoda*, to smear over warts to cause them to disappear, and as a snuff to relieve headache. Smith states that the Xosas rub the powdered roasted root into scarifications over fractures and on the side for stitch. According to Rand,[1] the Dutch settlers of Southern Rhodesia use a decoction of the root of " wild plumbago " in blackwater fever. He thinks that the preparation is probably diuretic. Bernhard Smith [2] mentions that the plant contains the toxic principles, *plumbagin* and *oil of plumbago*, but we have not found the original reference upon which this statement is based.

The Tongas and Shangaans use the root of **Plumbago zeylanica L.,** Shangaan *musisi*, along with **Eleusine coracana Gaertn.,** as a leprosy remedy. The powdered material is taken internally and applied locally.

REFERENCES

1. R. F. Rand: Med. J. So. Afr., 1914-15, x, 106.
2. A. Bernhard-Smith: Poisonous Plants of all Countries, 1923, 2nd Edition, 80.

C. SAPOTACEAE

The Zulus take an infusion of the bark of **Sideroxylon inerme L.,** White milkwood, Wit melkhout, Jakkalsbessie, Zulu *uMaphipha*, *umHlahla*, Xosa *umQwashu*, to dispel bad dreams. It is emetic. They administer the powdered bark to calves and goats as a tonic. The Xosas use a decoction of the bark for gall-sickness in stock (Smith). Medley Wood states that the bark is used as an astringent.

The Rozis rub the powdered root of **Chrysophyllum magaliesmontanum Sond.,** Stamvrugte, Tonga *munombelo*, Kololo *mulumbelo*, Wiko *musakalalu*, into skin incisions for rheumatism. The affected part is then heated and smoked over a pot containing the burning ashes of the root.

Chrysophyllum sp., *near* **Chrysophyllum prunifolium Bkr.,** Wemba *nabuwale*, *musongole*, is used by the Wembas in treating mental disease.

CI. EBENACEAE

The Thlapings make a " thorn-plaster " for the extraction of deep-seated thorns or splinters by mixing with mutton fat the roasted and powdered root of **Royena pallens Thunb.,** Monkey plum (Cape Prov.), Blue bush, Black root, Poison peach (St Helena), Bloubos, Swartbas (Kalahari region), Thlaping *mothlaye*, Shangaan *šintomane*, Kxatla *mothlatso*, Kxatla and Kwena *lethlaye*, Pedi *moxodire*, Suto *mohladyane*. In the Eastern Transvaal, natives apply charcoal made from the root to relieve aching of the eyes. The Kxatlas and Shangaans, to relieve body pains, use an ointment similar to the " thorn-plaster " of the Thlapings. They smear this preparation over the body of a widow or a widower to " cleanse " them before remarriage. Kxatla and Kwena women take a decoction of the root for menstrual disabilities. Laidler states that the plant is emetic and purgative, and that the Namas use a root decoction for pains in the stomach, and the same decoction, made with the addition of the stems, as a diarrhoea remedy. The decoction is bitter. The Thlapings use the root in tanning. The fruit is eaten by the Pedis.

Zulu women use **Royena lucida L.,** Wild coffee, Black bark, Swartbas, Zulu *umThimathane*, *isiNywane*, as an enema to relieve excessive menstrual pain (Bryant). The plant is suspected of being poisonous to sheep, but drenching with 200 grm. of dry leaf and fruit produces no effect.[1] Juritz [2] isolated 4·67 per cent. of *tannin* from the bark.

Bryant states that the Zulus use **Royena villosa L.,** Zulu *umNqandane-wezimpisi*, *umNqandane-wempisi*, *inDodemnyama*, as a purgative. He states that the plant is vesicant and is used as a counter-irritant by applying the pounded leaf or root to the painful part. The Zulus also rub the roasted and powdered root-bark into scarifications over fractures to hasten healing. Medley Wood records that the root is an ingredient of a Zulu emetic.

The Sutos drink a decoction of the root-bark of **Royena hirsuta L.,** Kraaibos,

Kritikom, Suto *phukhu*, Nama *d|nareeree*, in the treatment of gonorrhoea. According to Laidler, the Namas use the plant as a purgative.

Royena pentandra Gurke., Thonga *sirole*, is a Thonga remedy for haematuria (de Almeida).

The root of **Euclea coriaceae A. DC.,** Suto *radikokotwana, badikokotana, pholo-di-kokoto, phele-di-kokoto, thele-di-kokoto*, is used as a purgative by the Sutos. The plant is suspected of having caused the death of two Sutos at Maseru.

Zulu women use an infusion of the bark of **Euclea daphnoides Hiern.,** Zulu *iDungamuzi*, as an enema to relieve painful menstruation. It is administered once during the menstrual period on three consecutive occasions.

Euclea lanceolata E. Mey., Suto *mohlakolo, motsetlela*, Zulu *iDungamuzi, umShekisane*, Xosa *iYeza-lokuxaxazisa, umGwali*, Hottentot *guarri* (adopted into English), *boghguarri*, is much used by natives as a medicine. The Sutos and Xosas take it as a purgative, the latter using the root-bark particularly in biliousness. It is said to act rapidly. The Zulus use the plant as a dog remedy and as an antirheumatic, and Bryant states that they administer an infusion of the root-bark per rectum as a drastic purgative. He mentions that the Zulus never take the infusion by the mouth. The plant is used by Europeans as a diabetes remedy, but we have no details of the mode of application.

The root of **Euclea natalensis A. DC.,** Zulu *inTungamuzi, umTshekisane, iDungamuzi, isiZimane*, Shangaan *ntangule, nhlangule*, Chopi and Tonga *nhlangulane*, is a Zulu purgative. Bryant states that it is used particularly in abdominal complaints, usually taken as an infusion. It is liable to produce emesis. He is of the opinion that the plant is poisonous, and mentions, further, that it is an ingredient in a Zulu scrofula remedy. The Shangaans use the charred and powdered root as an application to the skin lesions in leprosy and internally for ankylostomiasis. The Tongas apply the powdered root for the relief of toothache and headache (de Almeida).

The bark of **Euclea undulata Thunb.,** Guarri bush, Raasbessie, Ghwarrie-boom, Kwar, Hottentot *guarri*, Suto *mokwêrekwêre*, contains 3·26 per cent. of *tannin*.[2] The fruit is edible.

Beyer records that the Sutos apply the powdered bark on a strip of the bark of **Dombeya rotundifolia** tied round the head for the relief of headache. He states also that an infusion of the root-bark is purgative.

A **Euclea sp.,** *prob.* **Euclea multiflora Hiern.,** Karanga *mushuma, dombo*, is powdered and applied to the sores of yaws by the Karangas.

An infusion of the bark of **Euclea sp.,** Zulu *uSahlulamanye*, is taken by the Zulus as an emetic in certain chest diseases, and a decoction of the root of **Euclea sp.,** Zulu and Swazi *inKunzienyama*, for syphilis. The latter is said to be mildly purgative.

In Portuguese East Africa the root of **Diospyros loureiriana G. Don.,** Kalanga *nhamodema*, is used by the natives for cleaning the teeth and for dyeing them a vermilion colour (de Almeida).

REFERENCES

1. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 791.
2. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.

CII. OLEACEAE

The Wembas use **Schrebera sp.** (=*So. Afr. Nat. Herb. No.* 01647), *near* **Schrebera galuncensis Welw.,** Wemba *kaMpande*, as a headache remedy, by inserting the chewed leaf in the nose and ears.

The Thlapings drink an infusion of the fresh bark of **Olea verrucosa Link.,** Wild olive, Wilde olienhout, Olienhout, Olyfhout, Thlaping *mothlware*, Suto *mohlware*, to relieve colic, and use an infusion of the leaf as an eye lotion in man and animal. Europeans also use this infusion as an eye lotion. The plant is a Suto headache remedy (Phillips). The fruit, though bitter, is eaten by the Thlapings, and the leaf is said to be astringent.

Thunberg records that the fruit of **Olea europaea L.,** Olive, Olyf, which does not often reach maturity in South Africa, was formerly used in the Cape as an astringent in diarrhoea. The unripe fruit, before pickling, is insupportably acrid.[1]

The Zulus administer the leaf of a **Jasminum sp.,** Zulu *uSwazi*, as an enema for biliousness. It is poisonous if given in overdose, which causes haemorrhage.

REFERENCE

1. United States Dispensatory, 1926, 21st Edition, 774.

CIII. LOGANIACEAE

The Rongas employ the fruit, freed of seeds, of **Strychnos dysophylla Benth.,** Zulu *umQalothi*, Ronga *nkwakwa*, *nfiuma*, Tonga *umKwakwa*, as a dysentery remedy.

The bark of **Strychnos henningsii Gilg.,** Hard-pear tree, Hardepeer, is taken as an appetiser and bitter in Eastern Pondoland. According to Bryant, the Zulus use the plant as an anthelmintic, and take the powdered bark in water, by the mouth, to relieve nausea and the pains of rheumatism. Rindl records that a decoction of the bark is used by natives as a purgative. The bark yields 4·8 [1] to 5·9 [2] per cent. of a bitter *alkaloid*, the chemical reactions of which do not resemble those of strychnine or brucine.[1, 2] The dry fruit husk contains 0·18 per cent. and the dry fruit kernels 4·4 per cent. of the alkaloid, while the latter contains, in addition, 19·3 per cent. of a fixed oil.[3] Rindl [2] has succeeded in getting a part of this alkaloid in a crystalline form, melting at 280·5° to 282° C., for which he puts forward four alternative formulae, $C_{20}H_{30}N_2O_3$, $C_{20}H_{32}N_2O_3$, $C_{21}H_{30}N_2O_3$, and $C_{21}H_{32}N_2O_3$. Steyn [4] finds that the bark produces in rabbits symptoms of poisoning resembling those of strychnine. Rindl [5] informs us that Merck has investigated the pharmacological action of the alkaloid, and finds that it produces depression and paralysis of the central nervous system, particularly the vasomotor and respiratory centres. The lethal doses are 0·25 mg. per gram for the mouse and 0·5 mg. per gram for the frog.

The bark of **Strychnos mitis S. Moore,** which closely resembles Strychnos henningsii botanically, contains a trace of *alkaloid*,[2] and produces no effects when given in large doses to rabbits.[4]

The pulp of the fruit of **Strychnos pungens Solered.,** Wild orange, Kaffir orange, Klapper, Tonga *um Kwakwa*, **Strychnos spinosa Lam.** (Brehmia spinosa Harv.), Kaffir orange, Klapper, Zulu *umHlala*, Tonga *nsala*, and **Strychnos gerrardi N. E. Br.,** Gulugulu, Tonga *um Kwakwa*, is acidulous from the presence of *citric acid*, and is very refreshing.[6] The seed contains no alkaloid,[1, 6, 7, 8] and none of the three plants appears to be toxic. We are informed, however, that the *unripe fruit* of **Strychnos pungens** produces vomiting, headache, and giddiness if eaten. The Tongas apply the crushed leaf of this species, mixed with water, to sore eyes, and use the fruit rind of **Strychnos spinosa** as an emetic. The latter plant enters into the Tonga death rites (Stevenson-Hamilton). According to Bryant, the Zulus use the root or shelled green fruit of **Strychnos spinosa** as a snake-bite remedy.

It would appear that **Strychnos schumannia Gilg.** may be toxic, for its Afrikaans name is Gifklapper.

A decoction of the bark of **Anthocleista zambesiaca Bkr.,** Fever tree, Big leaf, Northern Transvaal natives *umPala*, is used by natives in the neighbourhood of the Drakensberg, in the Northern Transvaal, as a remedy for malaria. For diarrhoea they chew the bark.

Nuxia congesta R. Br., Bogwood, Witsalie, is possibly used medicinally by the Hottentots (Laidler).

The bark of **Nuxia floribunda Benth.,** Wild elder, Vlier, contains 5·71 per cent. of *tannin*.[9]

According to Phillips, the Sutos take an infusion of **Gomphostigma scoparioides Turcz.,** Suto *moema-thata*, *mosika-nokana*, as a restorative in fatigue.

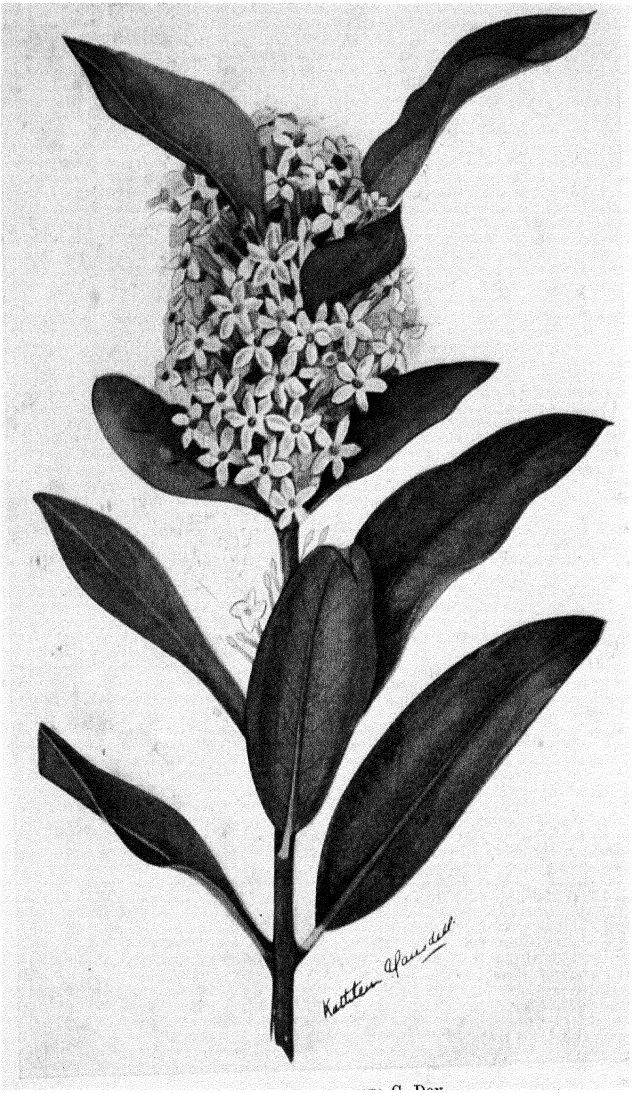
A decoction of the leaf of **Chilianthus arboreus DC.,** Chuana and Kwena *mothlware*, is a cough and cold remedy among the Chuanas and Kwenas.

According to Wicht, scrapings from the root of **Chilianthus oleaceus Burch.** (Chilianthus arboreus Burch.), Bastard olive, Vlier, Wilde vlier, are taken as a purgative, and sometimes produce vomiting. Wine, in which the root has been boiled, is taken for anasarca. Both these uses are European.

Buddleia salviaefolia Lam., Sagewood, Saliehout, Suto *lelothwane*, is possibly used medicinally by the Hottentots (Laidler). The Sutos administer to cases of incipient and early nervous and mental diseases a remedy in which one of the ingredients is **Buddleia sp.,** Suto *lelothwana*.

REFERENCES

1. Bull. Imp. Inst., 1915, xiii, 30, 52.
2. M. Rindl: So. Afr. J. Sci., 1929, xxvi, 50.
3. Bull. Imp. Inst., 1916, xiv, 33.
4. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 796.
5. M. Rindl: Trans. Roy. Soc. So. Afr., 1931, xx, 59.
6. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 12.
7. F. A. Flückiger: Arch. Pharm., 1892, ccxxx, 343, through ref. No. 1.
8. A. F. Sievers: Midl. Drug. Pharm. Rev., 1912, xlv, 233, through Chem. Abs., 1912, vi, 1057.
9. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228.



ACOKANTHERA VENENATA G. DON.

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Facing page 141.]

CIV. GENTIANACEAE

Smith states that an infusion of **Sebaea crassulaefolia Schl.,** Xosa *i Bulawa*, is used by the Xosas as a snake-bite remedy in man and animal, and for "stitch." Hewat says that natives, in addition to using an infusion of the root for "stitch," take it as a dysentery and colic remedy. He is of the opinion that the infusion is a bitter astringent.

A decoction of **Sebaea leiostyla Gilg.,** Suto *morwerwe*, *marama-a-barwetsana*, is a Suto snake-bite remedy (Phillips).

Chironia baccifera L., Christmas berry, Wild gentian (pink), Toothache berry, Piles bush, Aambeibos, Bitterbos, Tand-pyn-bessie, Ag-dae-genees-bos, Perdebossie, Meidjie willemse, is much used as a medicine. The plant is fried in butter, and the latter applied to sores by Europeans. An infusion is used as a lotion for the same purpose. A decoction of the whole plant, including the root, is taken as a "blood purifier" in all kinds of skin eruptions (acne, heat-rash, veld sores, boils, venereal sores, etc.). A decoction, an infusion, or a tincture is frequently taken by Europeans and coloureds as a purgative, especially for haemorrhoids. The infusion is sometimes used as a diarrhoea remedy. The purgative action is said to be mild, but Laidler states that the Hottentots use a decoction as a rapidly acting purgative. In addition to this, preparations of the plant are said to produce perspiration and sleepiness. Wicht states that the plant is bitter, and Marloth, that it is a native remedy for lepra.

The Sutos administer **Chironia krebsii Griseb.,** Suto *lepšetlane-la-dididba*, *tjatane*, and **Chironia palustris Burch.,** Suto *lepšetlane*, as remedies for colic and diarrhoea in children, and for relieving uneasiness in pregnant women (Phillips).

Swertia chirata Buch.-Ham., Chirata, Chiretta, grows in the Transvaal and is used as a bitter tonic, a use to which the plant has been put in India and Europe. It contains two intensely bitter substances, *chiratin*, $C_{26}H_{48}O_{15}$, and *ophelic acid*, $C_{13}H_{20}O_{10}$, *tannin*, *wax*, a soft *resin*, and a *sugar*.[1] Pammel states that chiratin is a glucoside. It is a yellow, hygroscopic powder, sparingly soluble in water and difficult to crystallise. It is easily split by acids into *ophelic acid* and *chiratogenin*, $C_{13}H_{24}O_3$, also a bitter substance.[1]

According to Bowie, **Villarsia ovata Vent.** and **Limnanthemum indicum Thw.** (Villarsia indica Vent.) are very bitter, and were used as antiscorbutics and febrifuges.

REFERENCE

1. United States Dispensatory, 1926, 21st Edition, 321.

CV. APOCYNACEAE

Acokanthera venenata G. Don. (Sideroxylum toxiferum Thunb., Cestrum venenatum Thunb., Toxicophloea thunbergii Harv.), Poison bush, Bushman's poison bush, Hottentot's poison bush, Kaffir poison bush, Poison tree, Gifboom,

Swazi *uNumbu*, Zulu *inHlungunyembe*, Xosa *inTlungunyembe*, *ubuHlungu-benyoka*, Suto *tsebedinthla*, is highly toxic. The fruit, in addition to other parts of the plant, is said to be very poisonous. The Zulus and Xosas administer the powdered root in the treatment of snake-bite, the remedy being taken either as a snuff or by the mouth. It is thought to prevent delirium. When swallowed, it produces a burning sensation in the mouth and stomach, and causes frothy vomiting. Some natives use a decoction of the root in anthrax and for tape-worm. According to Smith, the Xosas use the leaf as an emetic in snake-bite, and sometimes apply the pounded leaf to the swollen parts. Hewat states that natives take small doses of the plant and also apply it locally to relieve toothache. The juice has been used as an arrow poison by the Bushmen and Hottentots,[1, 2, 3, 4] and the plant has frequently been recorded as the cause of poisoning in both man [5, 6, 7, 8, 9, 10] and animals.[6, 11, 12] Hutchence [11] states that poisoning occurs in goats under field conditions, the symptoms being first dullness and anorexia, then violent spasms, followed in twenty-four to forty-eight hours by paralysis and anaemia. Curson [12] records that cattle, after ingestion of the plant, go off colour and show uneasiness. Anorexia is a constant feature, and there may be slight salivation. These symptoms are followed by abdominal pain and slowing of the pulse. Ultimately the pulse becomes faster and feebler, and finally irregular. Diarrhoea is a very common symptom. Juritz [6] observed many years ago that the poisoning took one of two forms in experiments conducted in the Government Chemical Laboratories. In the case of dogs, death results from exhaustion following on violent vomiting, and in the case of mice, from stoppage of the heart in systole. He mentions also that both types occur among the recorded cases of poisoning by the plant in man.

Lewin [13] isolated an amorphous glucoside from material grown in Italy. This is toxic, but differs chemically and physiologically from amorphous *acokantherin* isolated from other species. Krause [14] isolated *acokantherin* (*ouabain*) and *abyssinin* (*amorphous acokantherin*), the former a crystalline glucoside and the latter an amorphous glucoside, both of which have been isolated from other species.[10] The Imperial Institute [10] records that the plant contains no alkaloid and no cyanogenetic glucoside, but yields an amorphous, intensely bitter, toxic glucoside which has the typical digitalis action. The plant also contains some *oxalic acid*.[10] The Imperial Institute is of the opinion that their product is identical with the crude acokantherin isolated by Faust [15] from Acokanthera abyssinica K. Schum. Moir [16] and Moir and Lewis [17] have made attempts to isolate pure acokantherin, and have attempted to elucidate its structure. They found it impossible to isolate a pure crystalline product, but state that the most striking thing about their material is its "remarkable chemical and physical stability for a glucoside."

Acokanthera spectabilis Hook., Bushman's poison bush, Hottentot's poison bush, Xosa *inTlungunyembe*, *ubuHlungu-benyoka*, is thought by some writers to be simply a coastal variety of Acokanthera venenatum Don. Smith states that in Pondoland and Natal the former species is used in the same way as the Xosas use the latter. He states, further, that Acokanthera spectabilis has been used as an arrow poison. The Zulus use the root for destroying marauding

dogs. Morrison [18] finds that the plant has an action similar to digitalis, with minor differences.

The Vendas administer a decoction of the root of **Carissa edulis Vahl., *var.* tomentosa Stapf.,** Venda *murungulu*, to children as a gentle purgative. The fruit is edible.

The bark of **Gonioma kamassi E. Mey.,** South African boxwood, Cape box (false), Knysna boxwood, Kamassiehout, yields 3·83 per cent. of *tannin*.[19] According to the Imperial Institute,[20] the bark is extremely bitter, and contains small amounts of an *alkaloid*. Goodson [21] found the chief action of the alkaloid is to paralyse the central nervous system. The wood has been substituted at times for other boxwoods in the manufacture of shuttles in Lancashire, and is alleged to have produced symptoms of poisoning in a percentage of the workmen making them.[22, 23] The symptoms vary somewhat, but " respiratory trouble, sometimes of a nature simulating spasmodic asthma, headaches, cerebral depression, and nasal catarrh appear to be the most frequent." Cabinet-makers on the continent of Europe have also become affected with skin, respiratory, and cardiac symptoms as a result of working with the wood.[24]

The wood of **Gonioma kamassi** yields an *alkaloid* which produces the typical effects of *curare*, viz., stimulation of the spinal cord, paralysis of nerve cells, and paralysis of motor nerve endings.[22] Dixon [22] does not think that any cases of poisoning in cabinet-makers and other workers using the wood are due to the systemic action of this alkaloid, but that the deleterious effects in man are due to local actions of the wood dust in the nose, naso-pharynx, etc., and then probably only in people who show a marked efferent response to certain types of afferent stimulation.

This boxwood should be clearly distinguished from East London boxwood (Buxus MacOwani) and West African boxwood (Sarcocephalus diderrichii).

The leaf of **Diplorrhynchus mossambicensis Benth.,** Wemba *mwenge*, is a Wemba remedy for headache and stomach disorders. In Angolaland a strong decoction of the root is drunk by Europeans for the relief of blackwater fever. It is said to produce diuresis. The dried latex contains 74·6 per cent. of *resin*, 1 per cent. of *protein*, and 24·4 per cent. of a soft sticky substance resembling *rubber*.[10] A dried watery extract is without action on a cat when given by the mouth, and produces no diuresis.

Lochnera rosea Reichb. (Vinca rosea L.), Vinca, Soldatenbloem (Dutch Indies), Indische maagdepalm (Dutch Indies), is used as a diabetes remedy, particularly in Natal as well as in other parts of South Africa, and in Queensland. It is also used in treating menorrhagia. An infusion of the leaf by the mouth is the usual mode of administration. A firm of pharmaceutical chemists in South Africa has placed a preparation on the market, called "*Covinca*." Greshoff [25] isolated an *alkaloid* from the leaf and bark, and Boorsma [26] also isolated an *alkaloid* from the plant, which product is a " paralysing " poison. More recently, Cowley and Bennett [27] have isolated 0·53 to 0·85 per cent. of an *alkaloidal residue* from the leaf. By fractional crystallisation of the tartrates they have obtained three compounds from the residue, but no information is yet available regarding their structure or action. Epstein,[28] using Covinca, found that the plant has no effect on the normal or fasting

blood-sugar level of rabbits, and does not affect "the blood-sugar curve of experimental adrenalin hyperglycaemia." He found, on the other hand, that it had a weak digitalis action. Nye and Fitzgerald [29] found that a tincture of the leaf had no appreciable effect on the fasting blood-sugar level, nor did it diminish the rise in blood sugar after the administration of dextrose. Their observations were made on five patients. Lee and Drew [43] report similar negative results in the rabbit. Corkill and Doutch,[30] using an extract of the leaf, found that it produced no benefit in fourteen out of fifteen diabetic patients; the fifteenth showed an apparent diminution of the glycosuria, which was thought to be an indirect effect. They state that the preparation is an ideal purgative in chronic constipation. Any benefit derived by diabetics from the plant is due probably to the weak digitalis and purgative actions.

Vinca major L., Periwinkle, Maagdepalm, is astringent, and has been used in menorrhagia.[31] Pammel states that it is abortifacient. In Natal a decoction of the leaf is used in treating diabetes.[31]

Ervatania coronaria (Willd.) Stapf. (Vinca alba Noronka, Tabernae montana coronaria Willd.), is also used in diabetes, but we do not know whether it occurs in South Africa.

The washed and dried coagulated latex of **Conopharyngia elegans Stapf.,** Tonga *kahla*, *nkahlu*, Ronga *nkahlu*, yields 14·8 per cent. of *caoutchouc* and 72·8 per cent. of *resin*.[10] Among the Tongas the latex is used as a styptic and the root as a remedy for pulmonary diseases (de Almeida).

The Pondos use the bark of **Rauwolfia natalensis Sond.,** Quinine tree, Xosa *umJela* (?), Zulu *umHlambamanzi*, Venda *munadzi*, for abdominal troubles. The Vendas use it to kill maggots in wounds. It enters into the composition of a Zulu decoction for scrofula (Bryant). The Zulus also use it as an application to the skin in measles, urticaria, and other rashes (Bryant). The bark is bitter, and is said to produce severe purgation and abdominal pains. Juritz [32] isolated from it 0·2 per cent. of a crystalline, *bitter alkaloid*, melting at 200° C. This work and other references by Juritz [19, 33] have given the source of the material as **Tabernaemontana ventricosa Hochst.,** but he states later [9] that the plant is really **Rauwolfia natalensis Sond.** The pharmacological and therapeutic effects of the alkaloid have not yet been investigated.

Adenium boehmianum Schinz., Ovamba *echuja* (?), has been used by the Ovambas in South-West Africa as an arrow poison. Boehm [34] isolated a crystalline glucoside, *echujin*, and a resin, *echujon*, from the plant, and showed that the former has the typical digitalis action. De Almeida [42] states that **Adenium multiflorum Klotzsch.,** Ronga *bokaboka*, is a fish poison.

In the southern parts of the Kalahari Desert region, an ointment made from **Adenium oleifolium Stapf.,** Ouheip, is applied to snake and scorpion bites. An infusion of the root is taken as a tonic, particularly in gastric disturbances, and as a remedy for fevers. It is said to produce purgation when taken in excess.

Pachypodium sealii has been used in Damaraland, South-West Africa, as an arrow poison. It contains a *glucoside* with the typical digitalis action.[35] We have recorded this species under the only name which we have been able

to trace in literature, but it is likely that the plant has been renamed. According to Marloth, the tuber of **Pachypodium bispinosum (L. f.) DC.,** Kragman, Sterkman, is used in brewing a native beer.

Nerium oleander L., Oleander, Ceylon rose, South Sea rose, Rose bay, Dog bane, is an ornamental shrub frequently grown in our gardens and parks, especially as a hedge. Walsh states that the eating of a single growing top of the plant has proved fatal to horses and cattle. A Government stallion was lost in this way at Elsenburg Agricultural College.[36] Walsh also records that men have been fatally poisoned from eating meat which had been cooked on skewers made from its wood. The leaf and stem have been known to be poisonous almost since the dawn of medical history.[37] The plant was shown to have a digitalis-like action by Pelikan [38] in 1866. This was confirmed by Schmiedeberg [39] and Straub.[40] Schmiedeberg isolated two glucosides from the leaf, *neriin* and *oleandrin*. *Neriin* resembles *digitalein* in being soluble in water and alcohol and insoluble in ether. *Oleandrin* is insoluble in water but soluble in alcohol, ether, and chloroform. *Neriin* resembles *strophanthin* in its chemical behaviour, and has actually been named *l-strophanthin*.[41] Straub [40] isolated 1·15 per cent. of *oleandrin* from the leaf, and states that it resembles *digitoxin* in character and action. The nectar is said to impart poisonous properties to honey (Pammel), and it has been stated that smelling of the flower has produced toxic effects. This latter statement we do not believe to be true.

REFERENCES

1. C. P. Thunberg: Travels in Europe, Africa, and Asia, 1770-79, 2nd English Edition, 1795, *i*, 156; ii, 162.
2. S. S. Dornan: So. Afr. J. Sci., 1916, xiii, 357.
3. Flora Capensis: 1909, iv (1), 500.
4. I. Schapera: Bantu Studies, 1925, ii, 199.
5. A. Smith: A contribution to South African Materia Medica, 1895, 3rd Edition, 38.
6. Report of the Senior Analyst for the Year 1903, Cape of Good Hope, G. 59—1904, 58-61.
7. Report of the Senior Analyst for the Year ending 31st December 1904, Cape of Good Hope, G. 66—1905, 28.
8. Report of the Senior Analyst for the Year ending 31st December 1905, Cape of Good Hope, G. 43—1906, 40-41.
9. C. F. Juritz: So. Afr. J. Sci., 1914, xi, 110, 128.
10. Bull. Imp. Inst., 1915, xiii, 54, 368, 369.
11. M. A. Hutchence: Report of the Colonial Veterinary Surgeon for 1895, Annexure, Cape of Good Hope, G. 41—1896, 133.
12. H. H. Curson: 13th and 14th Rpts. Dir. Vet. Research, Union of South Africa, 1928, i, 208.
13. L. Lewin: Arch. f. path. Anat., 1893, cxxxiv, 231, through ref. No. 10.
14. —. Krause: Tropenflanzer, 1909, xiii, 134, through ref. No. 10.
15. A. S. Faust: Arch. exp. Path. und Pharm., 1902, xlviii, 272; 1903, xlix, 446.
16. J. Moir: J. So. Afr. Chem. Inst., 1924, vii, 28.
17. J. Moir and J. Lewis: J. So. Afr. Chem. Inst., 1925, viii, 11.
18. D. Morrison: Thesis Univ. Cape Town.
19. C. F. Juritz: Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, i, 228, 231.
20. Bull. Imp. Inst., 1916, xiv, 34.
21. Bull. Imp. Inst., Letter to J. M. Watt, dated 17th October 1928.
22. W. E. Dixon: Proc. Roy. Soc. B., 83, 1911, 287.
23. Annual Report Chief Inspector of Factories, Great Britain, 1908, 266, through ref. No. 22.
24. A. Nestler: Ber. bot. Ges., 1912, xxix, 672, through Chem. Abs., 1912, vi, 2793.
25. —. Greshoff: Med. 'slands Plantentuin te Buitenzorg, 1890, vii; 1898, xxv, through Pharm. Weekblad, 1928, lxv, 1089.
26. —. Boorsma: Med. 'slands Plantentuin te Buitenzorg, 1899, xxxi, through Pharm. Weekblad, 1928, lxv, 1089.
27. R. C. Cowley and F. C. Bennett: Austral. J. Pharm., 1928, ix, 61.
28. D. Epstein: So. Afr. Med. Record, 1926, xxiv, 35.

29. L. J. J. Nye and M. E. Fitzgerald : Med. J. Austral., 1928, ii, 626, through J. Amer. Med. Ass., 1929, xcii, 184.
30. A. B. Corkill and A. Doutch : Med. J. Australia, 1930, i, 313.
31. The Extra Pharmacopoeia of Martindale and Westcott, 1928, 19th Edition, i, 894.
32. C. F. Juritz : Rpt. Sen. Anal., Cape of Good Hope, 1901, 58.
33. C. F. Juritz : So. Afr. J. Sci., 1911, viii, 98.
34. R. Boehm : Arch. exp. Path. und Pharm., 1890, xxvi, 165, through ref. No. 37.
35. —. Helly : Zeitschr. exp. Path. und Ther., 1906, ii, 247, through ref. No. 37.
36. W. H. Chase : Report of the Colonial Veterinary Surgeon, Annexure, Cape of Good Hope, G. 41—1904, 79.
37. A. R. Cushny : Digitalis and its Allies, 1925, 11, 12, 14, 35.
38. —. Pelikan : Compt. rend. de l'Acad., 1865, lx, 1209 ; 1866, lxii, 237, through ref. No. 37.
39. O. Schmiedeberg : Arch. exp. Path. und Pharm., 1882, xvi, 149, through ref. No. 37.
40. W. Straub : Arch. exp. Path. und Pharm., 1918, lxxxii, 327, through ref. No. 37.
41. —. Leulier : J. de Pharm. et Chim., 1911 (7), iv, 157 ; 1912, v, 108, through ref. No. 37.
42. A. Gomes de Almeida : Bol. Agr. è Pecuário, 1930, i.
43. D. H. K. Lee and W. R. M. Drew : Med. J. Australia, 25th May 1929.

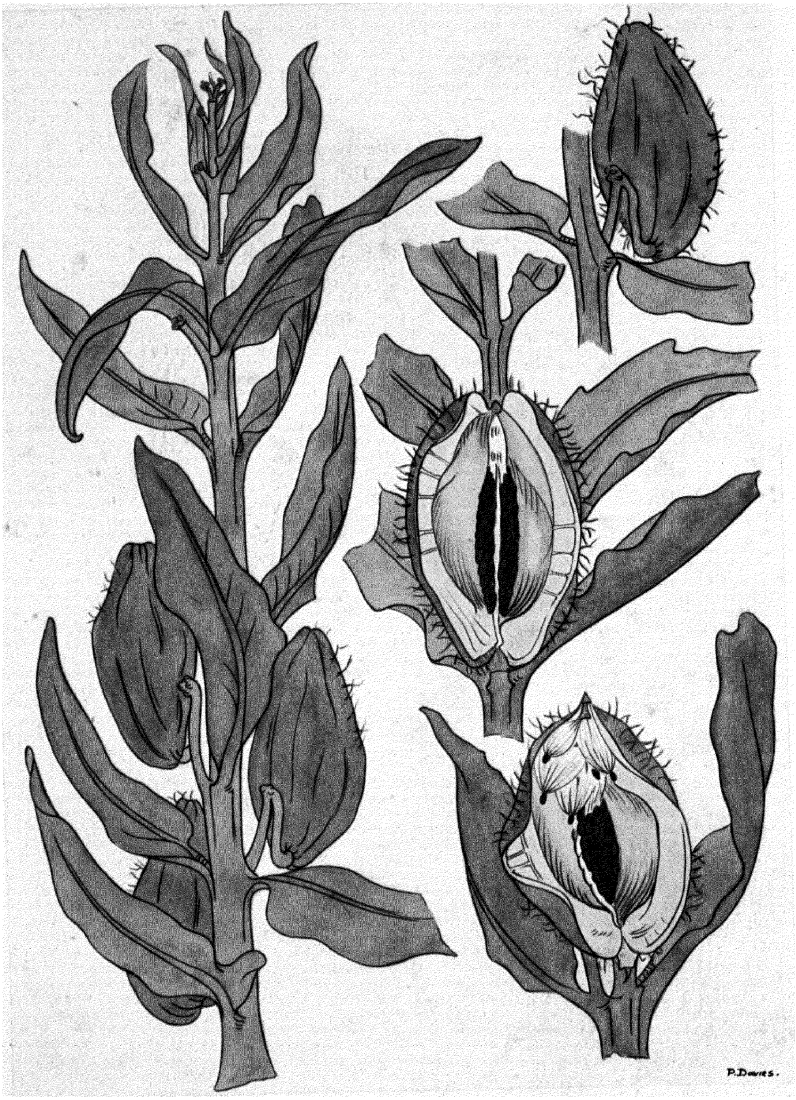
CVI. ASCLEPIADACEAE

Chlorocodon whitei Hook f., Zulu *uMondi*, Ganda *murundo*, is used by the Zulus for treating abdominal disorders. They also use the root as a " tonic," and in making a beverage akin to ginger-beer. The Masai (East Africa) use the root as a purgative and the Bondei (East Africa) to relieve body pains. The seed has apparently been used as an arrow poison.[1] The root is aromatic, and is described as having a vanilla-like odour ; the taste is said to resemble that of liquorice, or of ginger without its pungency. Tschirch states that it has been used as a substitute for senega root. Goulding and Pelly [2] isolated from it by steam distillation 0·2 to 0·5 per cent. of an odorous, *crystalline body isomeric* with *vanillin*. This is *p-methoxysalicylicaldehyde*. Dilling [3] found 1 to 1·2 per cent. of a *volatile oil*, 2·8 per cent. of a *fixed oil*, 20 per cent of *glucose*, 0·7 per cent. of *resin*, and 0·045 per cent. of a *glucoside* in the root. The volatile oil is golden-yellow in colour, has a coumarin-like odour, and is irritant. Dilling states that it is the most important pharmacological constituent of the root, and thinks that any " stimulant " effects from the use of the latter probably depend on this oil. The fixed oil is dark brown in colour and buttery in consistence. The glucoside produces in frogs paralysis of respiration and of the spinal reflexes, by an action on the motor cells. After a preliminary stimulation, the frog's heart is depressed. Dilling states that the glucoside occurs in the root in too small amount to produce effects in man, and that unless the seeds contain much more of it than the root, their use as an efficient arrow poison is open to doubt. Dilling thinks that the purgative action is due to the volatile and fixed oils and the sugar.

The bark of **Tagazzea kirkii N. E. Br.** *ex deser*, Zulu *isiMondane*, is a Zulu " tonic," taken in water or milk.

The Nyanjas of Nyasaland rub the roasted and powdered root of **Cryptolepis oblongifolia Schl.,** Nyanja *nangwali*, into scarifications on the forehead for headache and on the shoulders and arms for rheumatism. They also use a decoction of the leaf as a lotion for the same purposes.

The large underground tuber of **Raphionacme purpurea Harv.** (Raphionacme divaricata Harv.), Suto *kxerenthšane*, Xosa *inTsema*, is used



XYSMALOBIUM UNDULATUM R. BR.

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by natives in brewing an intoxicating beer. There is some confusion with regard to the name of the plant, but it appears that **Raphionacme divaricata Harv.** is the same as **Raphionacme purpurea Harv.** The Sutos, besides using the plant for beer-making, prepare a medicine for internal tumours from it (Phillips). The Imperial Institute,[4] using material named **Raphionacme divaricata,** analysed the pulp and found nothing which explains its intoxicating properties. Watt,[5] using material named **Raphionacme purpurea,** found that the fresh tuber ferments in water at room temperatures, and that watery and alcoholic extracts of both fresh and dried tuber depress the central nervous system in cats. This depression is remarkable in the duration of the effect, animals showing signs four days after administration. It is possible to produce death by the extract. Stephen,[6] working with tubers named **Raphionacme divaricata,** isolated a small amount of a *volatile oil* with an odour of sage, *saponin*, and *organic acids*, among which *citric* and *tartaric* were identified. She found that both a crude extract and the saponins were without action in animals, thus confirming the work of the Imperial Institute.

According to Bryant, the Zulus use the root of a **Raphionacme sp.** (?), Zulu *uMathanjana*, as one of their remedies for scrofula.

An infusion of the root of **Microloma sagittatum R. Br.,** Bokhorinkie, is used by Europeans and coloureds to relieve griping pains in the abdomen. If water is not available, a portion of the root is chewed. The infusion is red in colour.

Xysmalobium undulatum R. Br., Wild cotton, Milk bush, Melkbos, Bitterhout, Bitterwortel, Xosa *iShongwe*, *iTshongwe*, *iYeza-elimhlophe*, Zulu *iShongwe*, Pondo *iShongwe*, Suto *phohotsehla*, *lethokxwa*, *lešhokxwa*, has for long been used in the popular medicine, European and native, of South Africa. From time to time the plant has been known by the following names: *Xysmalobium lapathifolium Decne.*, *Asclepias undulata L.*, *Asclepias ciliata Murray*, *Gomphocarpus arborescens Spreng.*, *Gomphocarpus undulatus Schlt.*, and *Apocynum africanum, lapathifolium Commelin.* Xysmalobium undulatum R. Br. is now the accepted name. The Zulus use the ground-up stem in water as an emetic in poisoning, and they sprinkle the powdered root on skins and hides to prevent dogs gnawing them. The root has been widely used for treating indigestion and malaria and other fevers, including enteric. Near Koster, natives take an infusion of the root by the mouth for fevers, particularly malaria, and it is said to produce profuse sweating. The Xosas take an infusion or a decoction of the root for colic and abdominal troubles, and use the powdered root as a snuff to relieve headache. According to Smith, the Xosas take wine, in which grated root has been soaked, as a tonic, and apply the latex to festering wounds as a prophylactic against the development of maggots. The Sutos use the young leaves as a spinach (Phillips), and the root in the same way as the Xosas. They also apply fomentations made with the root to the chest for bad colds. The Pondos use a root decoction, or the powdered root alone, as a dysentery remedy. The Namas take the root as a stomachic, carminative, and diarrhoea remedy (Laidler). In older times the root, in addition to being a colic and diarrhoea remedy, was used for dropsy under the name of Asclepias undulata L. Nowadays it is seldom used for dropsy, but

is much taken for diarrhoeas and dysenteries, and as a "uterine sedative." The root is being exploited commercially both here and in Europe.

Brandwijk [7] has isolated two glucosides from an alcoholic extract of the root. One, *xysmalobinum*, $C_{46}H_{70}O_{20}$. $5H_2O$, is a pure crystalline product which is present to the extent of about 1 per cent. in the extract (0·3 per cent. of the dried root). This glucoside is less toxic than the extract from which it is made. The second glucoside was isolated in very small amounts, and was impossible to handle on account of the fact that it is highly deliquescent. The second appears to be the main toxic principle. The root, in addition, contains a small amount of *acid-saponins* and a large amount of *gum*, but no active volatile products, no alkaloids, and no tannin. A dry, alcoholic extract of the root is very toxic to animals, producing marked slowing of the heart, followed, in the case of large doses, by quickening; an intense constriction of the peripheral blood-vessels, causing a sharp rise in blood-pressure; and contraction of the intestinal and uterine musculature from direct action on the fibres.[8] The extract also produces a transient diuresis, which appears to be wholly due to the rise in blood-pressure.[8] Both the root and the extract are intensely bitter and slightly irritant.

The action of xysmalobinum has been investigated by Watt.[9] It is intensely bitter, and produces a digitalis-like action on the heart. The degree of toxicity is low compared with that of other glucosides of similar action. It contracts the smooth muscle of the uterus, intestine, bladder, and bronchi, the effect being especially marked on the last. This action on the bronchi results in severe respiratory embarrassment, which plays a part in the toxic action of the glucoside. The point of action in smooth muscle is peripheral to the nervous mechanism. The glucoside produces a marked increase in the flow of saliva, which is due to stimulation of the parasympathetic secretory terminations. It always produces a marked diuresis. The residues, which are left after the crystallisation of xysmalobinum, and which contain the second glucoside, have an action similar to xysmalobinum, but are very much more toxic.[10] The second glucoside undoubtedly represents the main toxic principle of the root.

There is no doubt that preparations of the root will act as an excellent bitter tonic, and that the diuretic and cardiac actions of the root may produce considerable benefit in dropsy, particularly when of cardiac origin. It is difficult to account for their use in diarrhoea and dysentery and as a "uterine sedative," except on the hypothesis that they relieve these conditions by expelling some irritant or noxious contents from the organs by the muscular action.

The Sutos use **Xysmalobium parviflorum Harv.**, Suto *leoto-la-kxoho*, as a colic remedy (Phillips).

The root of **Schizoglossum shirense N. E. Br.** is used by the natives in Portuguese East Africa as a stomachic and aphrodisiac (de Almeida).

The root of **Pachycarpus schinzianus R. Br.** is used for the same purposes as Xysmalobium undulatum, and resembles the root of the latter closely in appearance. There is evidence that it has a similar action.[11]

The Sutos sometimes mistake **Pachycarpus rigidus E. Mey.**, Suto

MILD POISONING IN A SHEEP BY FEEDING 1 LB. OF DRIED CYNANCHUM AFRICANUM R. BR.

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phomametsu, *lešokwana*, *seame-la-podi*, for an edible Asclepiad, with poisonous results. Phillips states that they use the plant as a colic remedy and as a vegetable in spring.

Natives in the Eastern Transvaal and in the Potchefstroom district use the root latex of **Pachycarpus validus N. E. Br.**, *maketula*, as a purgative in constipation and abdominal upsets. The action is said to be vigorous.

The Sutos use **Asclepias stellifera Schl.**, Suto *mohlatsisa*, *moholantja*, as a snake-bite remedy. It causes vomiting, and our correspondent informs us that the plant has been used by the Bushmen in making arrow poison. Pammel quotes Burtt-Davy as stating that it yields an excellent rubber.

The Zulus administer an infusion of the leaf of **Asclepias fruticosa L.**, Shrubby milkweed, Wild cotton, Firesticks, Wilde kapok, Melkbos, Gansies, Tontelbos, Zulu *uSinga-lwesalukazi*, Suto *moethimolo*, *modimola*, *lebeyana*, for intestinal troubles in children. The Sutos use scrapings from the dried stem as a sternutatory in fainting, and Phillips states they use the plant as a remedy for coryza. Of recent years the powdered leaf has come into common use among Europeans as a snuff for the treatment of pulmonary tuberculosis. It produces violent and prolonged sneezing, but no other effect. Burtt-Davy [12] records that feeding the plant to a beast killed it, the action being purgative. The plant thus apparently contains an irritant principle. Steyn [23] killed a rabbit by administering to it 40 grm. of fresh flowers, leaves, and stem *per os*, the symptoms being mainly respiratory in character. *Post mortem*, marked hyperaemia of the lungs was found.

Asclepias aurea Schltr., Suto *mohlatsisa*, is a Suto emetic (Phillips). **Asclepias decipiens N. E. Br.**, Suto *moethimolo-wa-thaba*, *modimola-wa-thaba*, *lebeyana-la-thaba*, Pedi *morelesikana*, Chuana and Kwena *modiboa*, is used by the Sutos as a snuff, and as a medicine for sore breasts (Phillips). The Chuanas and Kwenas make an ointment from the powdered plant, which is rubbed on the affected part in cramp.

According to Pappe, the root of **Asclepias crispa Berg.** (Gomphocarpus crispus R. Br.), Bitterwortel, is extremely bitter and acrid. He states that it is diuretic, and that a decoction or an infusion has been recommended for dropsy. A tincture has been used for colic. It would appear to resemble the root of Xysmalobium undulatum R. Br. in uses and possibly in action.

According to Bryant, **Gomphocarpus sp.**, Zulu *iNcohiba*, is very poisonous. It is probably either an Asclepias or a Xysmalobium.

Burtt-Davy [12] states that **Pentarrhinum insipidum E. Mey.** is possibly poisonous, but that drenching tests have proved negative. The young pods, which are shaped like cucumbers, are tasteless, and were formerly eaten by the Hottentots.[13]

The Namas drink a decoction of **Cynanchum capense Thunb.** (Vincetoxicum capense Kuntze.), Klimop, Bobbejaanstou, Bakkerbos, for the treatment of boils (Laidler). The plant is recorded as being toxic.[14, 15, 16] In this connection it should be noted that Cynoctonum capense E. Mey. is not identical with Cynanchum capense Thunb., as mentioned by Walsh.[15] O. Henning [14] produced a form of *cramps* or *krimpsiekte* by feeding the plant to bovines and sheep, but M. W. Henning [17] states that this resembles true Cotyledon

krimpsiekte only in so far as the symptoms are muscular and nervous in nature. The following description is from O. Henning's report.[14] The first symptom is staggering, and the affected animals are unable to stand quietly or to walk straight. The inco-ordination becomes more marked, and later cramps develop. They affect the limbs to begin with, but ultimately become general. These symptoms usually last for several hours, but finally the animal is unable to rise, and develops convulsions. The stage of convulsions may last as long as seven days, and ends in a paralytic stage, which is frequently prolonged for a longer time than the former. Despite its inability to rise, the animal feeds fairly well. Death takes place most commonly during the convulsive stage. Sheep and goats suffer more severely from the intoxication than cattle, and show a higher mortality. In cattle the first symptom is frequently marked stiffness of the hind limbs, the beast walking with short steps and arched back. It walks on its toes, and even on the front of the fetlock. Henning makes the interesting and suggestive observation that clapping the hands or stamping the ground often causes the sudden onset of convulsions. The *post-mortem* findings are vague : no inflammation of the gastro-intestinal tract, hyperaemia and oedema of the lungs, slight engorgement of the blood-vessels of the brain and spinal cord, slight enlargement of the spleen, and some hyperaemia of the kidneys.

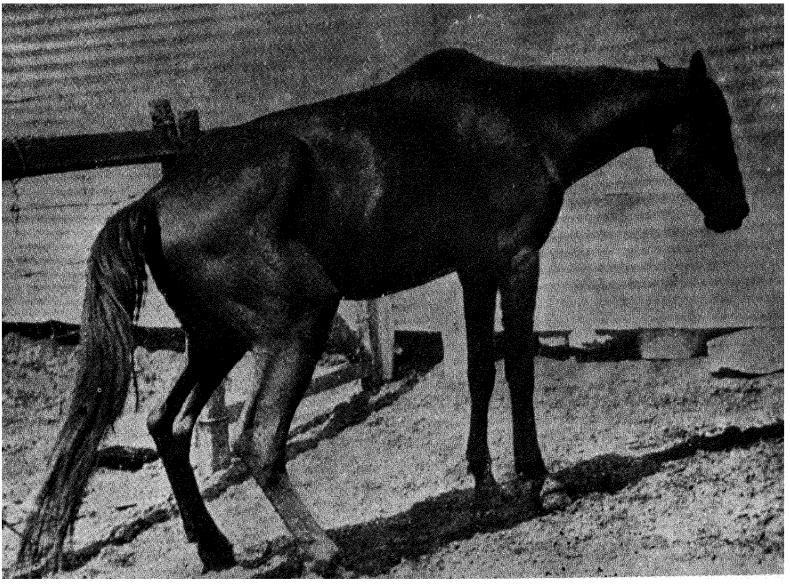
Cynanchum africanum R. Br., Excelsior, Klimop, Bobbejaanstou, Dawidjies, is also toxic,[18] and causes loss of stock. Curson [18] states that ingestion of the plant produces a form of *krimpsiekte*, which, however, differs from Cotyledon krimpsiekte by being much more acute. The symptoms are tremor and staggering gait, the animal ultimately falling with the head retracted and limbs extended. Finally, it lies unconscious. Clonic spasms of the muscles are seen early, which later on become tetanic. There is general tympany, the eyes are staring, the respiration is rapid and shallow, and the pulse is quickened. In severe cases there is opisthotonus, spasm of the jaw muscles, and convulsions, ending in death. *Post mortem*, nothing of note is found. This type of poisoning in stock is recorded from the south-western districts of the Cape only.

Cynanchum obtusifolium L. f., Klimop, is toxic to stock, producing, according to Hutcheon,[19] symptoms of gastro-enteritis, but Pattison [20] fed a stirk on the plant for weeks, the result being progressive emaciation, but no other symptoms.

Cynanchum natalitium Schltr. (Cynoctonum capense E. Mey.) also produces gastro-enteritis in stock.[19]

Goodall [21] records that a klimop, which he thought was a **species** of **Cynanchum,** produces acute gastro-enteritis in cattle on the veld.

Sarcostemma viminale R. Br., Melktou, Spantou-melkbos, Zulu *inGotsha*, Xosa *umBelebele*, Suto *namele-ya-dilomo*, *ntlalamêla*, is used by the Zulus as an emetic in heartburn. They also apply the latex to the eye in order to relieve the pain, due to the entry of the sap of the " rubber " tree. The Xosas and the Sutos (Beyer) use the plant as a galactogogue in cows and humans. Marloth states that it is toxic, but Steyn [23] administered 1.100 grm. of fresh plant to a sheep without effect.



APPEARANCE OF A HORSE THREE DAYS AFTER FEEDING **2 LBS. 2 OZ.** OF DRIED CYNANCHUM AFRICANUM R. BR.

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According to Bryant, **Secamone gerrardi Harv.,** Zulu *i Hlule-lemamba, u Gobandlovu,* is poisonous.

The Sutos use **Brachystelma foetidum Schltr.,** Suto *seru,* as a remedy for colds in children (Phillips), while the roots of **Brachystelma filiforme Harv.**[13] and **Brachystelma tuberosum R. Br.,**[24] Hottentot *t'kakuni,* are edible.

A tincture of **Trichocaulon rusticum N. E. Br.** is taken by Europeans and coloureds for tuberculosis of the lungs.

Stapelia gigantea N. E. Br., Carrion flower, Toad plant, Aasblom, Haasoor, Uilkos, Horinkies, Bokhorinkie, Duikershoring, Hotnotstoontjies, Zulu *uZililo,* is a Zulu remedy for hysteria. Bryant states it is emetic. The Zulus use a **Stapelia sp.,** Zulu *i Lili,* either **Stapelia gigantea N. E. Br.** or **Stapelia nobilis N. E. Br.,** burnt to an ash for rubbing into scarifications on body or limbs to relieve pain.

According to Pappe, natives formerly ate the stem of **Stapelia pilifera L.,** Nama *guaap,* as a thirst quencher. The Namas still use it for this purpose (Laidler). The early settlers in the Cape used a brandy infusion as a remedy for piles.

Phillips records that the Sutos bathe limbs with a hot infusion of **Stapelia flavirostris N. E. Br.,** Suto *bohatsu,* to relieve numbness.

In the Transvaal, Europeans use brandy in which **Fockea spp.** have been soaked, as a liniment for pains in the back (Pijper). Several **species** of **Fockea** are edible, but **Fockea capensis Endl.** is not.[22]

REFERENCES

1. Flora of Tropical Africa, 1904, iv (1), 255.
2. E. Goulding and R. G. Pelly: Proc. Chem. Soc., 1908, xxiv, 62; 1911, xxvii, 235.
3. W. J. Dilling: J. Pharm. Exp. Ther., 1926, xxvi, 397.
4. Bull. Imp. Inst., 1916, xiv, 35.
5. J. M. Watt: Bantu Studies, 1926, ii, 333.
6. Florence V. Stephen: Unpublished data, University of the Witwatersrand.
7. Maria G. Breyer-Brandwijk: Trans. Roy. Soc. So. Afr., 1927, xiv, 353.
8. J. M. Watt: Rev. Pharmacol. Ther. Exp. (in the press).
9. J. M. Watt: J. Pharm. Exp. Ther., 1930, xxxviii, 261.
10. J. M. Watt: Unpublished data.
11. J. M. Watt and Maria G. Breyer-Brandwijk: Unpublished data.
12. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 192, 198.
13. W. H. Harvey: Thesaurus Capensis, 1859, i, 7, 59.
14. O. Henning: (i) Cape Agr. J., 1893, xxv, 398; (ii) Report of the Chief Vet. Surg. and the Assist. Vet. Surgeons for the Year 1893, Cape of Good Hope, G. 41—1894, 22.
15. L. H. Walsh: South African Poisonous Plants, 1909, 14.
16. I. B. Pole-Evans: So. Afr. J. Sci., 1920, xvii, 27.
17. M. W. Henning: 11th and 12th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1926, i, 333.
18. H. H. Curson: 13th and 14th Rpt. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 205.
19. D. Hutcheon: Report of the Colonial Vet. Surg. and the Assist. Vet. Surgeons for the Year 1894, Cape of Good Hope, G. 42—1895, 10.
20. H. A. Pattison: Report of the Colonial Vet. Surg. and the Asst. Vet. Surgeons for the year 1894, Cape of Good Hope, G. 42—1895, 75, 77.
21. A. Goodall: Report of the Colonial Vet. Surg., Annexure, Cape of Good Hope, G. 41—1904, 82.
22. Kew Bulletin, 1909, viii, 349.
23. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, ii, 712.
24. C. F. Ecklon: So. Afr. Qtly. J., 1830, iv., 371.

CVII. CONVOLVULACEAE

The Sutos chew the root of **Convolvulus hastatus Thunb.,** Suto *morarana, morarana-o-monyenyane,* to relieve headache. Phillips states that they use this plant and also **Convolvulus ulosepalus Hallier f.,** Suto *morarana-o-*

monyenyane, *moroto-wa-pôhô*, *sehwete-sa-noka*, as a medicine for pregnant women. The Zulus use an infusion of the leaf of **Convolvulus farinosus L.**, Zulu *umKoka*, as an emetic for "stomach-ache" in adults. According to Smith, the Xosas think that the milk of cows which eat **Convolvulus sp.**, Large convolvulus, Xosa *uBoqom*, is constipating.

The Nyanjas of Nyasaland apply the sap of the leaf and flower of **Astrochlaena malvacea Hall f.**, Nyanja *chilemba*, for inflammations in the eye. It is said to sting somewhat when applied.

The Zulus use the leaf of **Ipomoea ficifolia Lindl.**, Zulu *um Khokha-wehlathi*, as a purgative and as a snake-bite remedy (Bryant), and the root of **Ipomoea crassipes Hook.**, Zulu *uVimb'ukhalo*, Suto (for *var.* longepedunculata Hallier f.) *mothokhxwana*, *maime*, *sekutle*, as an enema in dysentery. They also drink a mixture of the crushed leaf of **Ipomoea palmata Forsk.**, Zulu *uMaholwana*, for body rashes (Bryant), and take a decoction of the root of **Ipomoea albivenia G. Don.**, Wild cotton, by the mouth and as an enema to purify the blood (syphilis (?)) (Bryant).

The Sutos mix the leaf of **Ipomoea oblongata E. Mey.**, *var.* **hirsuta Rendle**, Suto *mothokxo*, with tobacco in making snuff, and the plant is used to drive away lightning (Phillips).

Ipomoea purpurea Roth., Morning glory, Zulu *i Jalambu*, *i Jalamu*, *i Jalapha*, is used by the Zulus as a purgative and as an anti-syphilitic. Power and Rogerson [1] have subjected the stem to an exhaustive analysis. They isolated 4·8 per cent. of *resin*, which is the active principle. This resin can be fractioned by extraction with various solvents. One-gram doses of each of the fractions produce in a dog the following effects :—

(i) Petroleum extracts 8 per cent., the product producing no action.
(ii) Ether extracts 7·3 per cent., producing marked purgative action in two hours, lasting for twenty-four hours.
(iii) Chloroform extracts 9·8 per cent. It has a less pronounced aperient action, but causes slight vomiting.
(iv) Ethyl acetate extracts 23·8 per cent., which has the same degree of purgative action as the ether extract.
(v) Alcohol extracts 5 per cent., which has the same degree of purgative action as the ether extract.

They isolated also 0·018 per cent. of a pale yellow *volatile oil* with a characteristic odour, approximately 0·2 per cent. of *potassium chloride* and *nitrate*, and a trace of *tannin*. Preparations of the plant, therefore, will act as an excellent purgative, but it is useless as a specific remedy in syphilis.

Some natives use the leaf and root of an **Ipomoea sp.**, native name *katela* (?), in making a decoction which is used as a lotion for eczema and abscesses. The boiled root from the decoction is in addition applied as a dressing. In Rhodesia the natives use the root of an **Ipomoea sp.** as a powerful purgative and emetic. Marsden [2] isolated 0·85 per cent. of *resin* from the outer parts of the root.

REFERENCES

1. F. B. Power and H. Rogerson : J. Chem. Soc., June 1908.
2. P. H. Marsden : Ann. Trop. Med. Univ. Liv., (?) 1913, vii, 335, through Chem. Abs., 1913, vii, 3817.

CVIII. BORRAGINACEAE

The Sutos inhale the steam from boiling the leaf and root of **Cynoglossum enerve Turcz.,** Suto *bohomenyane*, for the relief of fever. Phillips states that they use the plant as a colic remedy in children. The Namas take a decoction of the leaf of **Cynoglossum,** *prob.* **Cynoglossum micranthum Desf.,** Hound's tongue, Nama *koma*, *baleriaan*, Suto *motlepere*, *bohomenyane*, as a diaphoretic and an expectorant. Phillips states that the Sutos use the plant for colic in children.

Lithospermum arvense L., Cromwell-corncockle, an introduced species, contains *cynoglossin*, an alkaloid with a *curare-like* action.[1] It is not clear whether the plant contains another alkaloid *consolidine*, a central nervous system paralysant which has been found along with cynoglossin in other plants.

The Xosas use an infusion of **Lithospermum sp.,** Xosa *iYeza-lehlaba*, as a remedy for stitch (Smith).

According to Wicht, **Lobostemon fruticosus (L.) Buek.,** Douwurm-bos, Ag-dae-genees-bos, Luibossie, is used by Europeans as a tea with aromatic properties, and in decoction as a ring-worm remedy.

REFERENCE

1. R. Kobert: Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (2), 1186.

CIX. VERBENACEAE

Verbena officinalis L., Wild verbena, Vervain, Suto *seona-se-seholo*, an introduced species now widespread in South Africa, is used overseas as a popular medicine for fever, anaemia, dropsy, pleurisy, scrofula, and wounds,[1] but we have not heard of its being used as a household remedy here. The flowering tops contain a bitter, crystalline, l-rotatory glucoside, *verbenalin*, $C_{17}H_{25}O_{10}$, melting at 180·3° to 181·5° C., and soluble in water and alcohol.[2] *Invertin* and *emulsin* are also present.[2] The sugar of the glucoside is d-glucose.[2] Holste [3] isolated 0·244 per cent. of verbenalin from the plant and found the melting point to be 178° C. He found that the glucoside produces a stimulation of the motor activities of the central nervous system in frogs, followed in the case of large doses by stupor, clonic and tetanic convulsions, and finally paralysis. In mammals it produces little effect apart from stimulation of the uterus, causing an increase of tonus and a strengthening of the contractions.[3] Pammel states that the plant is irritant, but this is open to doubt.

The Sutos use a decoction of the root of **Verbena venosa Gill. and Hook.,** Suto *morodi*, for heartburn and colic (Phillips). Pammel states that it is irritant.

Lantana salvifolia Jacq., Bird's brandy, Xosa *uTywala-bentaka*, Zulu *ubuKhwezane*, *uGuguvama*, *umPhema*, Suto *mabele-mabutswa-pele*, *monokotswai-oa-makxwaba-matona*, *jwala-ba-dinonyana*, Pedi *mosunkwane*, Kwena and Chuana *selaole*, is used medicinally. The Xosas make from it a lotion for sore

eyes and festering sores. Hewat and Smith state that such a lotion is highly astringent, and causes smarting when it is applied. The Zulus administer the powdered root in milk to young children as an enema for abdominal troubles. The Pedis snuff the crushed leaves or use a cold infusion of the leaf as a nasal douche for coryza. The Kwenas and Chuanas administer a decoction of the root in cupful doses to women with ovarian (?) troubles.

Lippia asperifolia Rich. has the following names: Fever tea, Xosa *inZinziniba*, *umZinzinibe*, Zulu *umSuzwane*, Kwena and Chuana *bokhukhwane*. The Xosas drink a weak infusion of the leaf and stem in either milk or water for coughs, colds, and bronchial troubles generally. The infusion is sometimes made with the addition of **Artemisia afra,** and is then used also for fevers, influenza, measles, and as a prophylactic against lung inflammations (Smith). The Kwenas and Chuanas use a decoction of the leaf as a cough and cold remedy. Hewat states that natives use the plant in the treatment of anthrax, but that it is poisonous, and the treatment risky. There is no confirmatory evidence of the plant's toxicity, but Burchell records that it is much eaten by goats.[4] The smoke from burning the plant is sometimes inhaled for respiratory conditions (Hewat). The Zulus drink an infusion of the leaf for "gangrenous rectitis," and use the plant in treating measles, urticaria, and other rashes (Bryant). In Rhodesia the plant is a native remedy for blackwater fever, malaria, dysenteries, and other diseases (Dornan).

An infusion of the leaf of **Lippia scaberrima Sond.,** Beukesbos or Beukesbossie, Zulu *umSuzwane*, is a Zulu tonic, taken by the mouth or as an enema. It is used for the same purpose in animals. Among Dutch folks, brandy in which the leaves have been soaked is used as a stomachic and tonic. The leaf is lemon-scented.[4] Power and Tutin [5] state that the plant is said to have haemostatic and aperient actions, and is therefore used in the treatment of haemorrhoids. They isolated from the dried leaf and stem 5·5 per cent. of *tannin*, 0·25 per cent. of a brownish-yellow *volatile oil* with a camphoraceous odour, and they noted the presence of a glucoside which was not isolated. Merck [1] suggests that the glucoside is *verbenalin* (see Verbena officinalis). The plant is thus an astringent carminative, from the presence of tannin and a volatile oil.

The Zulus apply a cold infusion of the leaf of **Priva leptostachya Juss.,** Zulu *isiNama*, to inflammations of the eyeball, and a paste of the ground-up seeds to sores (Bryant).

The Zulus use **Vitex reflexa H. H. W. Pearson,** Zulu *umLuthu*, medicinally. To children they administer an infusion of the leaf, by the mouth or as an enema, for body pains and as a tonic, and an infusion of the bark to adults as a prophylactic emetic when members of a kraal are dying. They also administer, as an enema for stomach-ache, an infusion of the leaf of **Vitex rehmanni Gürke,** Zulu *umLuthu*.

Medley Wood, in "Natal Plants," states that **Clerodendron glabrum E. Mey.,** Zulu *umQaqongo*, Suto *mohlokohloko*, is used as a purgative for calves, apparently by the Zulus. The Zulus also use the leaf as a cough and fever remedy, and an infusion of the root by the mouth for snake-bite, especially mamba-bite. Bryant states that the Zulus use the leaf as one of their remedies

for intestinal parasites, and the root in infusion with **Iboza riparia N. E. Br.** (Labiatae) as an emetic in various vague rheumatic conditions. An infusion of the leaf is a Suto colic remedy (Beyer). To prevent the development of maggots, blowflies, etc., in wounds on animals, the Sutos and Swazis apply a decoction of the leaf.

The Wembas of Northern Rhodesia use **Clerodendron capitatum Schm. and Thb.,** Wemba *nakanchete*, as a purgative, and rub the powdered root-bark, with other ingredients, into scarifications on the abdominal wall to relieve intestinal troubles.

According to Phillips, the Sutos administer a decoction of the root of **Clerodendron triphyllum Pearson,** Suto *mokata*, as an enema in kidney disease. Steyn [6] found the plant non-toxic to rabbits.

Europeans and Natives at Ixopo take a teaspoonful of the powdered bark of **Clerodendron myricoides R. Br.** for snake-bite.

The Nyanjas snuff the crushed leaf of a **Clerodendron sp.** for the relief of headache. Around Nuanetsi, Southern Rhodesia, the root of a **Clerodendron sp.,** Ndebele *mbubudhla*, enters into the composition of a native remedy for malaria and pneumonia.

Avicennia officinalis L., White mangrove, is used for tanning.[7]

REFERENCES

1. E. Merck: Jahresbericht, 1917-18, xxxi und xxxii, 513.
2. L. Bourdier: (i) Arch. Pharm., 1908, cxlvi, 272, through ref. No. 1; (ii) Compt. rend. Soc. Biol., 1908, lxiii, 367, through Chem. Abs., 1908, ii, 661; (iii) J. de Pharm. et de Chim., 1908, xxvii, 49, 97.
3. —. Holste: Zeitsch. f. exp. Path., 1918, xix, 483, through ref. No. 1.
4. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Res., Union of South Africa, 1912, 213.
5. F. B. Power and F. Tutin: (i) Arch. Pharm., 1907, ccxlv, 337; (ii) Amer. J. Pharm., Oct., 1907.
6. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 801.
7. I. B. Pole-Evans: So. Afr. J. Sci., 1920, xvii, 11.

CX. LABIATAE

Ajuga ophrydis Burch., Suto *senyarêla*, is an ingredient in a Suto remedy for sterility. A decoction of the root is also used by them in the treatment of rashes, and the ashes of the plant mixed with fat in "doctoring" pegs round a village to prevent the entry of smallpox. Phillips states that the plant is a Suto remedy for painful menstruation.

Teucrium capense Thunb., Koorsbossie, Katjie-drieblaar, Maagbossie, Aambeibossie, is a popular remedy among the older Dutch folks. Brandy in which the plant has been soaked is taken as a stomachic and tonic, and a tea-like infusion is drunk for the relief of haemorrhoids. Europeans and Natives take a decoction for fever and influenza. The Xosas use an infusion as a snake-bite remedy and for sore throat, and sterilise anthrax-infected meat by boiling it with the plant. Both the Xosas and the Gcalekas regard the plant as a tonic. Hewat states that it is carminative.

The Zulus take a strong infusion of **Teucrium riparium Hochst.,** Zulu *isiHlungu*, Xosa *ubuHlungu*, as an emetic in snake-bite, while the Xosas and Fingos use a decoction as a tonic.

The Xosas and Fingos drink an infusion of the leaf of **Teucrium africanum Thunb.,** Padda klou, Akkedispoot, Bitter-bossie (Willowmore C. P.), Xosa *ubuHlungu, ubuHlungu-benyushu*, for snake-bite and as a tonic. They also sterilise anthrax-infected meat by boiling it with the plant, though Hewat states the plant is used rather as a condiment when eating anthrax-infected meat. The Pondos and Tembus use it as a snake-bite remedy, while the dried bark is used by some natives as a tonic. Sometimes the Xosas administer a decoction of the plant with **Rumex sp.,** *prob.* **Rumex crispus L.,** for the treatment of anthrax. In the Willowmore district a strong decoction is drunk in the treatment of haemorrhoids, and is often applied locally in the same condition. The decoction is frequently taken as a diaphoretic in feverishness.

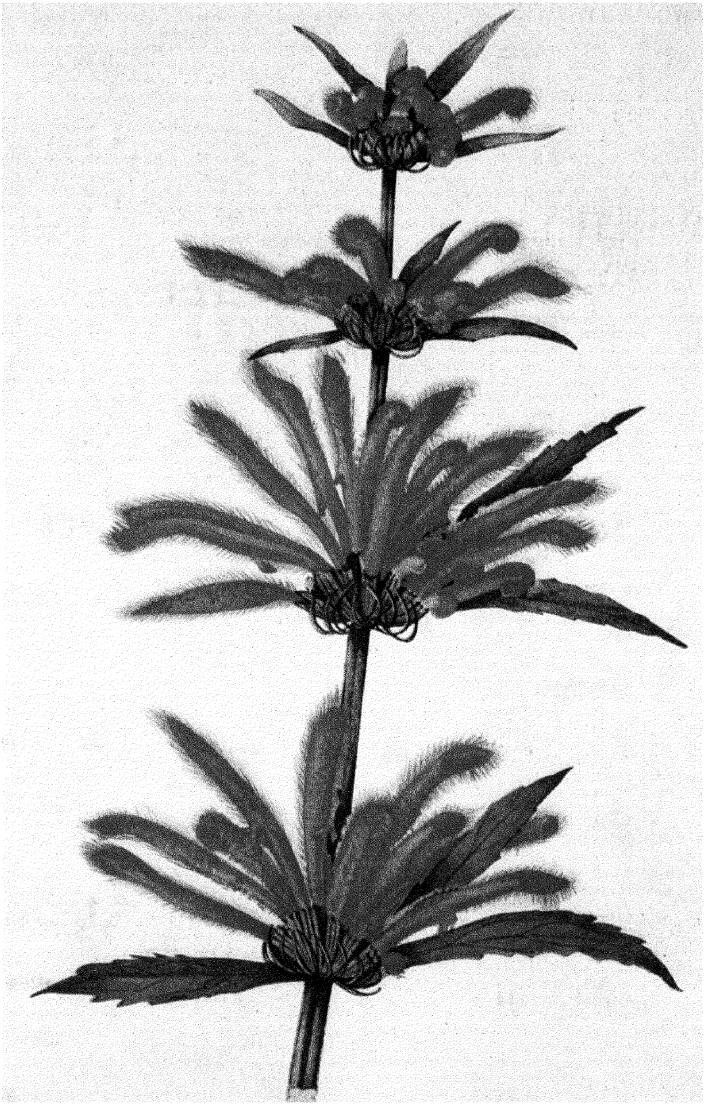
Oil of lavender, produced at Kirstenbosch from **Lavandula vera DC.,** has been analysed at the Imperial Institute,[15] and found to compare very favourably with French oil, and to have a high ester content.

Acrotome inflata Benth., Suto *mohlajwane, seya-le-moya*, is one of the Suto remedies for " blackleg " in cattle (Phillips).

Europeans use an infusion of **Marrubium vulgare L.,** Horehound, White horehound, Marvel, Koorsbossie, in febrile conditions, and especially in typhoid fever. Overseas, the infusion has been much used as a domestic remedy for bronchitis with profuse expectoration.[1] It is stated also to be tonic and, in large doses, purgative.[1] The plant contains a small amount of a *volatile oil*, some *resin, tannin*, and a bitter principle, *marrubiin*.[1] McCrea [2] states that marrubiin is a glucoside, melting at 156° to 159° C., and occurring to the extent of 0·34 to 1 per cent. in the seed.

Leonotis spp. are usually called *dagga*, which is also the common name for **Cannabis indica** in South Africa. They are supposed to be narcotic, and even habit-forming. We urgently require investigation of these plants, chemically, pharmacologically, and clinically.

Leonotis leonurus R. Br., Minaret flower (Turkey), Red dagga, Wilde dagga, Klipdagga, Zulu *uMunyane*, Xosa *umFincafincane*, Suto *lebake* (Patše), has been used since early times by natives. Pappe mentions that the Hottentots were particularly fond of smoking it instead of tobacco, and used a decoction of the leaf as a strong purgative and as an emmenagogue. He states also that the early colonists employed a decoction in the treatment of chronic cutaneous eruptions, possibly even in leprosy, and that the preparation produces narcotic effects if used incautiously. Twigs are added nowadays to baths for the treatment of skin diseases, particularly those with itching. The Zulus use an infusion of the leaf and stem, by the mouth and as an enema, for coughs and colds in both human beings and stock. The Kwenas and Chuanas use a decoction for the same purpose. The Zulus also use the root of the plant for snake-bite (Bryant), and use a cold infusion of the leaf as a nasal douche to relieve headache in febrile attacks. Laidler records that in olden times the Namas formed the powdered leaf into cakes which were chewed, evidently for the intoxicating effects. Now they use a decoction of the stem or seed for headache and bronchitis, and an ointment of the powdered leaf for pain about the eye. Europeans and Natives frequently drink a decoction of the above-



LEONOTIS LEONURUS R. BR.

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[*Facing page* 156.

ground parts of the plant, with or without the flower, for the relief of haemorrhoids, and apply it as a lotion for sores on the leg and head. Instead of the decoction, the fresh juice is sometimes applied to sores, and an infusion drunk for " blood impurity " (syphilis (?)). The leaf is smoked by Europeans suffering from partial paralysis, and they use the plant as a snake-bite remedy (Wicht). Taken internally, the plant is thought to reduce corpulence (Wicht). Smith records that the Xosas use a decoction of the plant or a tincture of the inner root-bark, both by the mouth, for snake-bite, and that Europeans take a tincture of the flower for coughs and chest affections, and for headaches. He states also that a leaf infusion is an excellent anthelmintic. A preparation of either the root-bark or the fresh leaf is a Suto snake-bite remedy (Beyer). According to Pijper, a decoction of " dagga " tops is taken by Europeans in the Transvaal for the relief of cardiac asthma, and applied locally in *herpes tonsurans*, and the plant is smoked for the relief of epilepsy. In Natal the plant is given to fowls for yellow and green diarrhoeas.

Marloth [3] isolated a dark green *resin*, which he thinks produces the narcotic action of the plant. He also isolated an easily crystallisable substance which he was unable to investigate. Copeman [4] isolated from the leaf a *reddish oil* with a high boiling point, *two phenolic compounds*—$C_9H_{10}O_5$ and $C_8H_{10}O_5$, the former melting at 247° to 248° C., the latter at 229·5° to 230° C.—and 19·8 per cent. of a *resin*. Gunn [5] finds that the plant is mildly anthelmintic, but too weak to be of practical use. He finds also that it is feebly narcotic, but expresses the opinion that the plant is probably harmless when smoked, and that the narcotic action is not of therapeutic value. He actually smoked several successive pipefuls of the dried leaf, but this produced no symptoms apart from unpleasantness.

Leonotis leonotis R. Br. (Leonotis ovata Spreng.), Lion's-ear, Klipdagga, Knoppiesdagga, Zulu *umCwili*, is used much in the same way as Wilde-dagga (Leonotis leonurus). A decoction is an Xosa snake-bite remedy, and is used for gall-sickness in cattle (Smith). According to Laidler, the Namas use it in the same way as Leonotis leonurus. Wicht states that the plant has properties similar to those of Cannabis indica, and that it is used like Leonotis leonurus. Pappe mentions that in the eastern districts of the Cape Province the plant replaced Leonotis leonurus as a remedy. Marloth [3] isolated dark green *resin*, to which he ascribes the narcotic property of the plant.

Natives use an infusion of **Leonotis microphylla Skan.,** Wild dagga, Knop-dagga, Wilde-dagga, Klipdagga, Kwena and Chuana *semomonane*, as an application to painful spots and to haemorrhoids. Europeans and Sutos drink the infusion to relieve digestive disturbance, particularly if accompanied by fever. The infusion, for this purpose, is often made with the addition of blue-gum leaves and Wilde-als (Artemisia afra). Europeans also take it for chest affections. The Kwenas and Chuanas drink a decoction in large doses for coughs and colds.

The Xosas use an infusion of the leaf and root of **Leonotis mollis Benth.,** Balm of Gilead, Xosa *umFincafincane*, Suto *jwala-ba-dinonyana*, as a snake-bite remedy. Phillips states that the Sutos use the plant as a purgative, and sometimes mix it with their tobacco.

Europeans take an infusion of the leaf of **Leonotis dysophylla Benth.,** Klipdagga, Zulu *uMunyane*, before meals as a tonic and in " nerve weakness." Natives in the Eastern Transvaal use a decoction of the leaf and stem for colds and as a tonic in calves.

A decoction of **Leucas martinicensis Ait.,** Tumbleweed, Tolbossie. Kruisement, is drunk hot by Europeans for colds, and is also used in women's ailments. Sometimes the steam from the decoction is inhaled for colds.

The Nyanjas of Nyasaland squeeze the leaf sap of **Leucas decurvata Bkr.** into the eyes to relieve purulent inflammation.

The Xosas drink a decoction of the leaf of **Lasiocorys capensis Benth.,** Aambeibos, for chest ailments. Europeans and Pedis take an infusion of the above-ground parts for haemorrhoids. The root is specifically avoided in making these remedies.

An infusion of **Ballota africana Benth.,** Cat-herb, Kattekruie, is taken by Europeans for colds and influenza, and is used as a lotion for sores on the head and for thrush. Natives use it for relieving severe colic, and as a snake-bite remedy. Wicht records that a weak infusion in brandy is occasionally taken by Europeans for internal haemorrhoids. Pappe likens the plant to horehound (**Marrubium vulgare**), and states that the early colonists used a decoction or an infusion of the leaf for chronic pulmonary troubles, particularly in obstinate cough and in asthma. He mentions that the plant has an aromatic, bitter taste, and is toxic. It was represented as being narcotic in the trial of C. A. van der Merwe for the murder of his wife in 1838 (Pappe). There is no support for the view that the plant is poisonous.

Stachys aethiopica L., Suto *lebate, bokxatla, bolao-ba-ditaola* (the latter two names for *var.* **glandulifera Skan.**), is used by the Sutos as a snake-bite remedy, and prophylactically against " black quarter " in cattle by allowing them to inhale the smoke. Phillips records that the Sutos burn *var.* **glandulifera Skan.** in the hut of a person suffering from feverish delirium ; this is said to produce a soothing effect.

Some Sutos use **Stachys rugosa Ait.,** Dassiebos, Jakob-jong, Suto *kofi*, and **Stachys rugosa Ait.,** *var.* **linearis Skan.,** Suto *taraputswê*, as a tea. An infusion of the herb is used as a galactogogue and tonic by the Xosas. Colonel Faichnie states that it has a definite galactogogic action.

The leaf of **Salvia repens Burch.,** Saliebossie, Suto *mosisidi, mosisidi-oa-loti*, is added to the bath for treating sores on the body. The Sutos take a decoction of the root in large doses before meals for stomach-ache and diarrhoea, and they administer the preparation to cattle for the latter. According to Phillips, the Sutos use the smoke from burning the plant to disinfect a hut after sickness, and to drive away bugs.

Cape coloured people take a milk decoction of **Salvia sisymbrifolia Skan.,** Bloublommetjiesalie, Suto *mosisidi*, for sore throat, and apply a water decoction as a lotion to sores and swellings. Phillips states that the Sutos use the plant in the same way as Salvia repens.

An infusion of the leaf of **Salvia paniculata L.,** Aromatic sage, Afrikaansesalie, Wilde-salie, Bloublom, Blousalie, Bloublomsalie, is regarded by Europeans as being efficacious in the treatment of coughs, including whooping-cough, colds,

and bronchitis. Europeans also use an infusion of the leaf and flower for diarrhoea. Wicht regards the preparation as being diaphoretic, while Laidler states that the Namas use a leaf decoction for coughs, colds, and female ailments.

An infusion of **Salvia africana L.,** Purple sage, Wild sage, Aromatic sage, Afrikaanse-salie, Wilde-salie, Bloublom, Bloublommetjiesalie, is taken by Europeans as a remedy for coughs, colds, and chest troubles. Wicht says it is diaphoretic. The Namas use it in the same way as Salvia paniculata (Laidler). An infusion of twigs mixed with Epsom salts and lemon is a common household remedy for all abdominal troubles, such as diarrhoea, colic, flatulence, and indigestion, and is frequently given to cows after calving, to aid in the expulsion of the placenta. Pappe states that the plant is fragrant, astringent, and bitter, and that it is used like Salvia officinalis.

A decoction of **Salvia coccinea Juss.** (introduced from Tropical America), Maksalie, Vra-vir-pa, is taken by Europeans for the relief of lumbago, " kidney disease," and the cough of pulmonary tuberculosis.

The Sutos burn **Salvia runcinata L. f.,** Suto *mosisidi*, **Salvia stenophylla Burch.,** Suto *mosisidi*, or **Salvia repens Burch.,** Suto *mosisidi*, *mosisidi-oa-loti*, in a hut to disinfect it after sickness, and to drive away bugs, and mix one or the other with their tobacco (Phillips). They administer a decoction of **Salvia triangularis Thunb.,** Suto *mosisidi*, for liver-sickness in cattle, and a similar decoction made with the addition of **Helichrysum latifolium** and **Commelina africana** to women for barrenness.

Smith states that a paste of the leaf of **Salvia scabra Thunb.,** Xosa *uSikiki*, *isiCakathi*, made with mother's milk, is given as the first medicine to Xosa infants. Walker,[6] on the other hand, says that the root is soaked in water, and that some of the water is given daily to the new-born for about two months. The water is usually putrid. Hewat states that the leaf paste is given as a purgative.

Farmers use an infusion of **Salvia rugosa Thunb.** as a lotion for sores, and as a tea.[7]

An infusion of **Salvia aurea L.,** Geelblom-salie, Strandsalie, Wilde-salie, Sandsalie, is taken by Europeans for colds, and is said to be diaphoretic (Wicht). The Namas use a decoction for coughs, colds, and female ailments (Laidler).

The Kwenas and Chuanas take a decoction of the root of a **Salvia sp.,** Kwena and Chuana *mogašane*, in large doses for biliousness.

Mentha longifolia Huds., which includes the *subspecies* **capensis Briq., polyandra Briq.,** and **polyadena Briq.,** is known by the following names: Wild mint, Pennyroyal, Kruisement, Ballerja (?), Xosa *inZinziniba*, *in Xina*, Zulu *uFuthanelomhlange*, Suto *kwena*, *kwena-ya-thaba*. A decoction of the herb is administered by Europeans and Natives to hasten prolonged confinements and to induce labour pains. It is also used to relieve pain in the back and to relieve pain during menstruation. The preparation is said to produce marked diuresis. The Zulus make a pleasant beverage from the leaf, and also take an infusion of the root, stem, and leaf, either by the mouth or as an enema, to ward off an incipient cold. The Xosas take a milk or water decoction for coughs, colds, and bronchial troubles generally. An ointment of the plant is applied to wounds by both Europeans and Natives. Application of the leaf direct is

said to cause irritation. Phillips states that an infusion made from the subspecies, together with **Mentha aquatica,** is used by the Sutos as a remedy for colds. They also place these plants under the bedding of a person suffering from chest trouble, which procedure is said to make the breathing easier. The leaf yields, by steam distillation, 2·4 per cent. of a *volatile oil*, similar to *oil of spearmint* obtained in England and America from **Mentha spicata Huds.** and **Mentha viridis L.**[8]

An infusion of **Mentha capensis Thunb.,** Wild mint, is used to relieve painful or delayed menstruation. According to Pappe, the plant was formerly prized as an antispasmodic and carminative, and was used as an infusion in flatulent colic and other conditions. Externally it was applied to glandular and other swellings.

The bark of **Mentha aquatica L.,** Mint, Munt, Zulu *umNukani*, *uMayime*, Xosa *iTyaleba*, Suto *kwena-e-nyenyane*, *kwena-ya-didiba*, is powdered, and eaten by natives with porridge for the relief of diarrhoeas, dysenteries, and other abdominal upsets. The Xosas, Chuanas, and Sutos take a decoction of the herb, in unlimited quantity, for colds, and they also use the plant as a tea substitute. (For a Suto use of the plant, see under Mentha longifolia.) The plant yields a volatile oil,[1, 9, 10, 11] known as *poco oil*.[1] This is used in Java for headache and in cholera.[1] Gordon [10] isolated 0·85 per cent. of the oil from dry material, and gives a full account of the other constituents. Schimmel & Co.[11] isolated 0·8 per cent. of pale yellow oil with a faint odour of mint. Kremers [12] finds that the oil consists largely of *linaloöl acetate*, with small amounts of another ester and of free *linaloöl*.

Mentha crispa L., Kruisement, is one of the officially permitted sources of *oleum menthae viridis* (oil of spearmint).[13] An infusion is used in South Africa in gynecological complaints (Wicht).

Mentha pulegium L. grows abundantly in the Cape Province, and fresh material yields 0·47 per cent. of *oil of pennyroyal*. Tests show that the oil has the usual characters of European oil of pennyroyal, and contains a high percentage (93) of pulegone.[15]

According to Phillips, the Sutos administer a decoction of **Aeolanthus canescens Guerke,** Suto *thokolwane*, to children with colds.

The Zulus take a decoction of the root or an infusion of the leaf of **Plectranthus hirtus Benth.,** Zulu *iBozane*, for coughs and chest complaints, and inject the powdered leaf of **Plectranthus laxiflorus Benth.,** Zulu *uFuthane*, as an enema for feverishness and abdominal upsets. Animals are drenched with the same preparation when they are off their feed. The Zulus also administer, as an enema for influenza, the powdered above-ground parts of **Plectranthus rehmannii Guerke,** Zulu *uMadolwana*. Children, in addition, may be bathed with the preparation.

According to Phillips, the Sutos use **Plectranthus natalensis Guerke,** *forma* **glandulosa,** Suto *lephelephele*, for washing skin coats and cotton garments.

The Zulus administer an infusion of the leaf of **Iboza riparia N. E. Br.** (Moschosma riparium Hochst.), Zulu *iBoza*, *iBozane*, for coughs and respiratory troubles. Sometimes it is taken as an emetic to clear the respiratory passages of phlegm. The Lalas use an infusion of the young shoots for similar purposes.

Both the Zulus and the Lalas use the plant, together with **Fagara capensis,** for gall-sickness in cattle. According to Bryant, the Zulus, in addition to its use in respiratory troubles, take the plant as a stomachic and for the relief of dropsy.

Syncolostemon parviflorus E. Mey., Zulu *umNandi*, is a Zulu emetic used for loss of appetite in adults. In children the plant is administered as an enema, in milk, for the same condition.

The dried fruit (ex Transvaal) of **Ocimum americanum L.** (Ocimum canum Sims.), Suto *mmaywatwane*, yields 1 per cent. of a colourless *volatile oil* with an *anise-like* odour. This contains no *thymol*, in contra-distinction from the oil obtained from **Ocimum viride Willd.** which contains from 32 to 65 per cent.[14] For haemorrhage from the nose, the Sutos either inhale the smoke from burning the dried leaf or apply an ointment made with the powdered leaf (Beyer).

In the Transvaal, Europeans take, as a haemorrhoid remedy, brandy in which **Ocimum sp.,** Timie, and other plants have been soaked (Pijper).

Europeans use a strong decoction of **Rosmarinus officinalis L.,** Rosemary, Roosmaryn, as a hair lotion. It is used to stimulate the growth of the hair and for eczema of the scalp. A weak infusion is taken in heart diseases. The flowering tops of the plant yield a *volatile oil* which has the usual carminative and rubefacient properties of this group of oils.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1375, 1376.
2. Adelia McCrea: J. Amer. Pharm. Assoc., 1930, xix, 231.
3. R. Marloth: (i) Agr. J., Cape of Good Hope, June 1909, 7; (ii) The Chemistry of South African Plants and Plant Products, 1913, 13.
4. P. R. v. d. R. Copeman: Union of So. Afr. Dept. Agr., Sci. Bull., xxviii, 1923.
5. J. W. C. Gunn: Arch. Internat. Pharmacodyn. Thérap., 1929, xxxv, 266.
6. P. H. Walker: So. Afr. Med. Record, 1914, xii, 140.
7. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 216.
8. Bull. Imp. Inst., 1920, xviii, 350; 1923, xxi, 130.
9. G. Romeo and U. Giuffrè: Ann. Chim. Appl., 1927, xvii, 83, through Chem. Cent., 1927, ii, 879.
10. S. M. Gordon: Amer. J. Pharm., 1928, C, 509, through Pharm. J., 1928, cxxi, 403.
11. Schimmel & Co.: Semi-ann. Rpt., 1913, through Chem. Abs., 1913, vii, 2655.
12. R. E. Kremers: J. Biol. Chem., 1922, lii, 439.
13. The British Pharmacopoeia, 1914, 270.
14. Bull. Imp. Inst., 1924, xxii, 277.
15. Bull. Imp. Inst., 1930, xxviii, 15.

CXI. SOLANACEAE

Phillips states that the Sutos smoke **Lycium kraussii Dun.,** Suto *mosukutswane*, *moferefere*, to relieve headache. They also rub the ashes of the plant into incisions on the hands and feet to relieve rheumatism. According to Marloth, the leaf of **Lycium arenifolium Miers.** and of **Lycium prunus-spinosa Dun.,** both known as Kriedoring, is used medicinally, but he gives no details.

Withania somnifera Dun. is known as Geneesblaar, Meidjieblaar (East Province), Vuilsiektebos (Bothaville, O. F. S.), Xosa *ubuVumba*, Fingo *uVimba*, Suto *mošala-marupi*, *mošalašopeng*, *moferangope*, *moferangopa*, *bofepha*, Zulu *ubuVimba*. The Sutos use a decoction of the root for colds and chills, while Transvaal Sutos administer it to tone up the uterus in women who habitually

miscarry and in order to remove retained conception products. According to Phillips, the Sutos use the plant as a remedy against intestinal parasites introduced by witchcraft. Beyer states that they take an infusion of the bark for asthma and apply an ointment of the leaf to bed-sores. An enema of the decorticated root is given by the Zulus to feverish infants. Bryant states that they regard the plant as a specific for " gangrenous rectitis," using an infusion of the root with that of **Pentanisia variabilis** as an enema. He says also that they use the plant in treating syphilis, and thinks that it has antiseptic properties, as the leaf is successfully employed in healing sores. The Xosas apply the fresh juice of the leaf to anthrax pustules, and use the plant for disinfecting anthrax-infected meat. They make an ointment for wounds and sores by boiling the leaf in fat, and administer a decoction of the root-bark in asthma and other chest complaints. The green berries are bruised, and rubbed into ringworm in both human beings and animals. A paste of the leaf is applied to syphilitic sores, and a paste of the green berry, leaf, and small twigs to saddle sores and girth gall in horses. Europeans, in the Free State, apply a leaf paste to erysipelas, take a decoction of the root for chest complaints, and use a decoction of the leaf externally and internally in the treatment of haemorrhoids. Pammel states that the plant is abortifacient. Trebut [1] records excellent results as a hypnotic from the use of an alcoholic preparation in emphysema, alcoholism, and pulmonary tuberculosis. He isolated an alkaloid, *somniferine*, which he states is hypnotic but not mydriatic. Pitini [2] records that a watery extract is slightly narcotic to dogs. In the American Journal of Pharmacy [3] it is stated that the plant has had various medicinal properties attributed to it, particularly that it acts as a sedative and hypnotic. These results and statements are not upheld by the very thorough work of Power and Salway.[4] From the root they isolated, among other things, 0·006 per cent. of a light brown pungent *volatile oil*, a *sugar*, a mixture of *fatty acids*, a new monohydric alcohol, *withaniol*, $C_{25}H_{23}O_4OH$, and an amorphous *alkaloidal principle*, which, on treatment with alkali, yields a crystalline base, $C_{12}H_{16}N_2$. The leaf and stem yield a very small amount of *volatile oil*, *tannin*, a *sugar*, a considerable amount of *potassium nitrate*, a mixture of *fatty acids*, a new monohydric alcohol, *somnirol*, $C_{32}H_{43}O_6OH$, a new dihydric alcohol, *somnitol*, $C_{33}H_{44}O_5(OH)_2$, and *withanic acid*, $C_{29}H_{45}O_6COOH$. Alcoholic extracts of the root and leaf and stem produce no perceptible effect on a dog, while the alkaloid is also inactive in dogs. Any action, therefore, which the plant may have is due to the volatile oil, which will produce the usual carminative effects.

Physalis peruviana L., a species naturalised from South America, is known as Wild gooseberry, Cape gooseberry, Appelliefie, Appelderliefde, Pompelmoer, Kaapse klapbes. Zulu *uGqumuggumu*. The Zulus administer an infusion of the leaf as an enema to children with abdominal upsets. The heated leaf is applied by Europeans as a poultice to draw inflammations (Wicht). The fruit is edible, and much prized for jam-making.

Physalis minima L., also an introduced species, is known as Wild gooseberry and Kalkoengif. According to Steyn,[5] farmers think that ingestion of the plant produces abortion in sheep, but he found that repeated oral administration of the plant did not affect pregnant ewes.

Solanum nigrum L., Black nightshade, Garden nightshade, Common nightshade, Woody nightshade, Deadly nightshade, Hound's berry, Petty morel, Galbessie, Nagskaal, Nagskade, Nastergal, Xosa *umSobo, umSobosobo, seshoa-bohloko,* Zulu *umSobo,* is used by Europeans for convulsions. The Zulus administer an infusion as an enema to infants with abdominal upsets. The Sutos rub the burnt and powdered root into incisions on the back for the relief of lumbago (Phillips). Hewat states that the plant is one of the native remedies for local application to anthrax pustules, and that natives apply a paste of the green berries to ringworm. The Xosas use the plant for disinfecting anthrax-infected meat (Smith). According to Dornan, in Rhodesia the natives use the plant as one of their remedies for malaria, blackwater fever, dysenteries, and other diseases. Pappe records that in older times the juice or a decoction of the herb was made into an ointment for foul ulcers. The *ripe* fruit is not toxic in South Africa, and is eaten by the Zulus, Xosas, and Sutos, and by Europeans. Mixed with honey, it is sometimes administered to people suffering from pulmonary tuberculosis, and it makes a delightful jam. The fruit is recorded as being toxic in Germany [6] and America (Pammel). The *unripe* fruit has been suspected of producing death in sheep, and Steyn [35] finds that it is toxic to the rabbit. The Sutos use the young shoots as a spinach (Phillips), and the leaves are eaten as a vegetable in the Isle of France, Bourbon Island, and Hawaiian Islands, after boiling in water. The plant contains *solanine* and a *tropeine alkaloid* with a mydriatic action.[7] Henry[8] confirms the presence of solanine, while Tschirch[9] states that the berries contain it. It would appear that the berries may sometimes contain the mydriatic alkaloid, for the symptoms in the cases of poisoning recorded by Kanngiesser[6] were mydriasis, restriction of accommodation, dryness of throat, and lessened secretion of sweat, etc., but no alteration in pulse rate.

Solanine is a gluco-alkaloid which has been isolated from several species of Solanum, but the principle isolated from different species is by no means necessarily identical. *Solanine,* $C_{52}H_{93}O_{18}N \cdot 4\frac{1}{2}\ H_2O$, is frequently associated with another gluco-alkaloid, *solaneine,* $C_{52}H_{83}O_{13}N \cdot 3\frac{3}{4}\ H_2O$, and *solanidine,* $C_{40}H_{61}O_2N$, a basic decomposition product of solanine. The formulae given are by Firbas. The following formulae for solanine have been suggested by the writers mentioned, $C_{28}H_{47}O_{11}N \cdot 2H_2O$ (Cazeneuve and Breteau), $C_{42}H_{75}O_{12}N$ (Davis) and $C_{32}H_{51}O_{11}N$ (Colombano). The melting point is 244° C. (Firbas), 250° C. (Cazeneuve and Breteau), and 235° C. (Davis). The substance occurs as needle-like crystals, almost insoluble in water, readily soluble in hot alcohol, barely alkaline to litmus, and with a bitter taste. The action is similar to the saponins, but much less toxic. For a full discussion of the subject, see Henry,[8] from whom most of this data has been quoted. Clinically, the symptoms of poisoning are vomiting and diarrhoea, accompanied by headache and colic, and followed by depression.

The Xosas rub the pulp of the fruit of **Solanum capense L.,** Nightshade, Xosa *umThumana,* Suto *moqhinyetsane, monyaku,* Zulu *isiThumana,* on warts and ringworm in man and animal. They fill hollow teeth with the powdered root to make them drop out, and take the root in milk for dysentery. They use an infusion of the leaf as a lotion for scrofulous ulcerations. According

to Smith, the Xosas apply a leaf paste to such ulcerations and take the root as a cough remedy and for the relief of dysuria. The Xosas and others administer either the fruit juice or the root to dogs with distemper and biliary fever. The Sutos and Zulus use the berries to make milk sour (Phillips, Wood [10]). According to Bryant, the Zulus take a decoction of the root in milk for urinary diseases, and insert a paste of the leaf into the urethra for inflammations of that channel. They steam the face and wash the eyes with a leaf decoction in purulent ophthalmia, and insert the powdered root into hollow teeth to relieve pain.

Both Europeans and Sutos take a decoction of the root of **Solanum panduraeforme E. Mey.,** Apple of Sodom, Bitterappel, Gifappel, Suto *thola-e-nyenyane*, *tholana*, Suto (O. F. S.) *setlwane*, Pedi *morolane*, *serolane*, Kwena and Chuana *morolwana*, for the relief of haemorrhoids. The Sutos also use the root as a toothache remedy (Phillips). The Kwenas and Chuanas rub an ointment of the burnt plant into the legs for rheumatism. The powdered root is a Pedi remedy for aphthae in children. The ripe and unripe fruit is toxic to rabbits.[35]

A decoction of the root of **Solanum tomentosum L.,** Zulu *umThumana*, Suto *tholana*, *tholana-e-nyenyane*, Ila *inTuntulwa*, is a Zulu remedy for syphilis. The Sutos use the plant as a medicine for sore throat (Phillips). In Northern Rhodesia the Ilas apply the fruit juice to "itch."

In Natal the juice of the fruit of **Solanum acanthoideum E. Mey.,** Bitter apple, Prickly apple, is applied to "sandworms," and is said to be curative. The Xosas apply it to ringworm. The fruit is regarded as poisonous.

The fruit of **Solanum auriculatum Ait.** is said to be poisonous, and we are informed that it has caused several human fatalities in the Red Hill district of Natal. Tschirch states that the stem contains *solanine*.[9] The seed does not appear to be toxic, for Medley Wood [11] notes that birds are fond of it.

The Zulus rub the ash of the fruit of **Solanum aculeastrum Dun.,** Apple of Sodom, Bitter apple, Gifappel, Zulu *umThuma*, into incisions over the knees for the relief of rheumatism in that situation. Marloth [12] states that the plant contains so much *solanine* as to be a dangerous poison.

An infusion of the root of **Solanum aculeatissimum Jacq.,** Apple of Sodom, Zulu *umThuma*, Suto *thola-ya-meutlwa*, is a Zulu snake-bite remedy. Kobert [7] and Tschirch [9] say that the plant contains a gluco-alkaloid with a *saponin* action.

The leaf of **Solanum giganteum Jacq.** (Solanum niveum Thunb.), Geneesblare, was formerly used as a dressing for foul ulcers, the under woolly surface being applied to cleanse the lesion and the upper smooth surface to heat it (Pappe). The early settlers also used an ointment of the fresh juice of the fruit and leaf for a similar purpose (Pappe). The Xosas and the Fingos use the berry to curdle milk.

The Chuanas administer to children with abdominal or head troubles either a decoction of the root or the root itself of **Solanum supinum Dun.,** Bitter apple, Dortelappel, Chuana *seletšane*, Suto *monyaku*, *moqhinyetsane*. The Sutos use the fruit to curdle milk (Phillips). Davy [13] mentions that the plant is thought to be poisonous and to contain *solanine*. Recently, two children

were poisoned in the Orange Free State by eating the fruit: one of them died. The symptoms were severe purging, with extrusion of the rectal mucosa, vomiting, and convulsions.

Burtt-Davy [13] states that **Solanum incanum L.,** Bitter apple, Suto *thola*, Pedi *morola*, is more or less poisonous, and contains *solanine*. Tschirch confirms the presence of solanine. Steyn has fed the ripe fruit to goats, sheep, and rabbits without effect, but finds that the unripe fruit is toxic to rabbits.[33, 35] The plant is apparently used by the Sutos as a remedy for toothache and sore throat (Phillips). The Pedis take a decoction of the plant, made with Fagara capensis Thunb., for chest troubles, and parts of the plant, roasted, for pleurisy and pneumonia (Watt and van Warmelo). We are informed by a farmer that the juice of the fruit enters into the composition of an arrow poison used by the Bushmen and possibly also by the Hottentots.

The Xosas apply the fruit juice of **Solanum sodomeum L.,** Apple of Sodom, Bitter apple, Gifappel, Zulu *umThuma*, Suto *morola*, or a paste of the leaf to "itch," to scab in sheep, and to harness sores on horses. The Sutos apply the juice of the fruit or of the leaf to skin diseases and chew the root for the relief of colic (Beyer). The Zulus administer the root-bark for barrenness and impotency (Bryant), and the Tongas hold the crushed fruit in the mouth to relieve toothache (Stevenson-Hamilton). The fruit has been exhaustively investigated by Oddo [14] and his co-workers. He isolated 0·25 to 1 per cent. of a *solanine* which he has named *solanine-s*, $(C_{27}H_{47}O_9N)_2H_2O$, or $(C_{27}H_{46}O_9N)_2H_2O$, melting at 245° to 250° C. or 275° to 280° C., according to the method of isolation and of heating. This solanine appears to differ in composition from that isolated from other sources, but it is a gluco-alkaloid with the usual saponin-like action. The toxicity is low. The stem also contains solanine (Tschirch). Marloth [12] is of the opinion that the plant contains so much solanine as to be a dangerous poison.

The eating of the fruit of **Solanum macrosolum Fern.,** Bitterappeltjies, has been suspected of producing poisoning in a child. The symptoms were vomiting, followed a few days later by urticarial rash, quick pulse, and pyrexia.

Solanum pseudocapsicum L. is an introduced species known as Jerusalem cherry, Natal cherry, and Winter cherry. The fruit is said to have caused fatal poisoning in children,[15, 16] the symptoms given in the one record being nausea, somnolence, marked abdominal pain, and dilatation of the pupil.[16] Such symptoms are said to follow the ingestion of three to four berries.[16] In South Africa there is some difference of opinion in regard to its toxicity, some medical practitioners stating that the fruit is non-toxic, others, the opposite. According to Phillips,[34] the fruit is sometimes toxic, at other times non-toxic. Dry alcoholic extracts of the leaf and of the fruit are toxic to animals.[17, 18] The former extract, which is the more toxic, produces marked slowing of the heart, which is due to a direct depression of the pacemaker. When the slowing is marked, it is accompanied by a fall in blood-pressure.[17] Breyer-Brandwijk [18] has isolated from the dry leaf 0·25 to 0·53 per cent. of an alkaloidal product, and states that this is the only active substance which she could isolate. The leaf contains *no solanine*. This work conflicts with that of Martinenq,[20] who

records the presence of *solanine* and *solanidine* in all parts of the plant. The percentages in fresh green fruit are given as solanine 0·31 and solanidine 0·22. Breyer-Brandwijk's work is confirmed by Barger's Laboratory in Edinburgh, where two alkaloids have been isolated: *solanocapsine*, and another differing from it by a molecule of water.[21] Breyer-Brandwijk's alkaloidal product has been investigated pharmacologically,[18] and has the same action as a dry alcoholic extract of the leaf. Solanocapsine hydrochloride produces a similar action.[22] It has very much the same toxicity as the crude alkaloid of Breyer-Brandwijk, which is moderately poisonous. Its most important and most striking effect is on the heart, which is slowed by direct action on the muscle. Impulse formation at the pacemaker is slowed, and there is marked retardation of conduction throughout the cardiac tissues.[18]

The fumes from heating the fruit pulp of **Solanum,** *prob.* **Solanum rigescens Jacq.,** Xosa *umThuma*, are inhaled by the Xosas to relieve toothache. Our informant states that the fruit is highly toxic.

According to Smith and Hewat, the Xosas drink a decoction of the root of **Solanum,** *prob.* **Solanum melongena L.,** Egg-plant, Xosa *umThuma*, Suto *thola*, in the treatment of syphilis, and apply a paste of the leaf to the external manifestations. The Sutos tie a portion of the inner part of the root on the wrists of pregnant women, which procedure is thought to keep them in good health. The fruit is eaten as a vegetable.

The Chuanas drink a decoction of the root of a **Solanum sp.,** Chuana *borumolano*, with milk or meat to produce pointing of what they regard as internal abscesses. A **Solanum sp.,** Suto *tholwana*, is administered as a decoction for the relief of female ailments.

Datura stramonium L., an introduced species known as Thornapple, White stramonium, Stinkweed, White stinkweed, Stinkwort, Devil's apple, Mad apple, Apple Peru, Devil's trumpet, Dewtry, Fireweed, Jimson weed, Jamestown weed, Jamestown lily, Stinkblaar, Pietjie Laporte, Olieblaar, Olieneut, Xosa *um Hlavuthwa*, Fingo *umVumbangwe*, Zulu *iLogi*, *iYoli*, Suto *lethšowe*, *lethšowi*, *mphufi*, Tonga *zaba-zaba*, is now widespread as a weed in South Africa. It is much used as a popular medicine, and is of considerable toxicological importance. The Xosas and Fingos use the leaf to blister the skin over inflammations where there is no open sore. The former apply the leaf for the relief of headache (Smith). Europeans apply a warmed pad of the leaf to painful and swollen parts, and a similar poultice to ingrowing toe-nails and to burns. In former times the fresh warmed leaf or the vapour of an infusion of the leaf was applied particularly to relieve the pain of rheumatism and gout (Pappe). Europeans also make an ointment containing the juice of the leaf and young shoot for application to running sores. A poultice of the leaf was formerly applied to carcinomatous ulcers (Pappe), but this use does not appear to have survived. The smoke from the burning leaf is inhaled for the relief of asthma and bronchitis. A European remedy for haemorrhoids is to steam the part over boiling water containing the leaf. The fruit juice is applied to the scalp for falling hair and dandruff. The Zulus apply the powdered leaf to bruises and wounds in both man and animal, the application being thought to draw out pus and inflammation. Bryant states that they use it as a soothing application

SOLANUM PSEUDOCAPSICUM L.

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to painful wounds and sores, while Dornan mentions that Rhodesian natives have a similar use. In Southern Rhodesia, natives apply the fresh leaf to tropical ulcer. The Sutos use a decoction of the plant to bathe bruises (Phillips), and apply the leaf for headache (Beyer). Tonga witch-doctors administer a drink, made from the leaf together with the root of **Lonchocarpus capassa,** to disputants who appear before them for a settlement (Stevenson-Hamilton).

The leaf and seed are toxic, containing *hyoscyamine* and *atropine*. South African dried leaves yield 0·54 per cent. of total alkaloids, and compare very favourably as a commercial product with those produced elsewhere.[23] The seed is the part of the plant most commonly involved in cases of poisoning in South Africa. It occurs either accidentally, through contamination of cereals, or through the eating of seeds usually by young children. For example, the seeds have been known to contaminate maize, wheat,[24, 25] and beans.[26] The symptoms, as would be expected, are delirium, tachycardia, mydriasis, dryness of mouth and throat, and generalised blush. In the occurrence mentioned under reference No. 26, there was wholesale poisoning of natives working in a South-West African mine, the symptoms being mydriasis, tachycardia, headache, dryness of mouth and throat, absent-mindedness, delirium, and loss of motor power. Vomiting and purging was seen in a few cases. There were no deaths. On the other hand, ingestion of the seeds, sometimes in large amount, by young children frequently leads to a fatal issue. Beyers [25] states that the sucking of nectar from the flowers produces a mild degree of poisoning in children. According to Walsh, the seeds often cause the death of ostrich chicks, the symptoms being staggering gait, spasmodic jerking of the neck, stupor and coma.

Datura tatula L., also an introduced species, is known as Purple stinkweed, Purple stramonium, Purple thornapple, Purple Jimson weed, Stinkblaar, Blou stinkblaar, Olieboom, Suto *lethšowi*. It is frequently not distinguished from **Datura stramonium L.** Europeans smoke the leaf for the relief of asthma, and both they and Sutos apply a leaf poultice to sores, ulcers, boils, etc. It is very likely that this plant is used in many of the other ways mentioned under Datura stramonium L. Like the latter, it contains *hyoscyamine* and related alkaloids, and is therefore toxic. The seeds are said to be especially poisonous (Pammel).

Datura metel L., Thornapple, is also poisonous, on account of the presence of *hyoscyamine* and related alkaloids. The Imperial Institute [27] states that the leaf from South Africa and India is deficient in alkaloidal content, while that from Montserrat is satisfactory. Pammel mentions that the nectar is toxic.

Dornan records that an extract of a **Datura sp.** has been used by Rhodesian natives for trial by ordeal. The preparation usually produces vomiting and purging. If the accused person rapidly becomes unconscious and dies without vomiting, then he is held to be guilty.

A **Datura sp.,** *prob.* **Datura fastuosa L.,** Ronga *mondjo*, is administered by the Tongas for trial by ordeal (de Almeida). The symptoms shown by the accused are those of hyoscyamine poisoning. This species contains hyoscyamine and related alkaloids.

Cestrum nocturnum L., introduced from South America, is toxic to stock. Both Chase [28] and Walsh report that cuttings, when eaten, may produce poisoning. The symptoms are dullness, tachycardia, high temperature, suppression of urine, and slowing of the respiratory rate (Walsh). Death occurs with coma after slight convulsions. Chase states that experimentally the plant does not always poison stock, and he considers that it is toxic only when dry. He states also that cattle will not eat the plant when green. Robertson [29] records that, fresh or wilted, the plant was not toxic in feeding tests.

According to Marloth, **Cestrum umbellatum Pang.,** an introduced species, known as Ink berry, is toxic, but no details are recorded.

The dried leaf of ordinary tobacco, **Nicotiana tabacum L.,** is used as a styptic by both Europeans and Natives. "*Nicotine*" or "*pypolie*" (the "*juice*" from a tobacco pipe) is used, according to Hewat, as one of the native remedies to be rubbed on the anus in cases of typhoid fever. Wicht states that it is applied to snake and insect bites and to rid the skin of ticks—it is apparently toxic to ticks and causes them to drop off. Tobacco leaf contains *nicotine*, a highly caustic liquid alkaloid, very toxic, and producing death by paralysis of the respiratory centre. The fatal dose of nicotine for a man is about 60 mg., of tobacco about 2 grm. The action of nicotine is extremely rapid. The nicotine-content of South African tobacco has been investigated. Juritz [30] finds that the air-dried leaf of heavy tobaccos yields 3 to 5 per cent., and of lighter tobaccos 1 to 2 per cent.

According to Phillips, the Sutos use the leaf of **Nicotiana rustica L.** (which yields Turkish tobacco), Suto *koae*, for smoking and as a snuff. The snuff is applied to children with cold in the head as a sternutatory. Like Nicotiana tabacum, it contains *nicotine*. South African grown Turkish leaf has been found to yield 6 to 8 per cent.[30]

Nicotiana glauca R. Grah., Wild tobacco, Wilde-tabak, Suto *tabaka bume* (evidently from the Afrikaans), is poisonous to cattle and ostriches,[13, 31, 32] and to sheep and rabbits.[35] Walsh states that it is poisonous, green or dry, and that ostriches are particularly susceptible. He records the symptoms in ostriches as staggering gait, spasmodic jerkings of the head, dullness, and stupor. Death occurs within a few hours. Juritz [30] isolated less than 1 per cent. of *nicotine* from the air-dried leaf. It would appear, therefore, to be less dangerous than cultivated tobaccos.

REFERENCES

1. —. Trebut: Lancet, 1886, i, 467.
2. A. Pitini: Arch. Farm. Sper., 1924, xxxviii, 151, through Phys. Abs., 1924-25, ix, 489.
3. Amer. J. Pharm., 1891, lxiii, 77, through ref. No. 4.
4. F. B. Power and A. H. Salway: J. Chem. Soc. Trans., 1911, xcix, 490.
5. D. G. Steyn: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 800.
6. F. Kanngiesser: Klin. Monatsbl. Augenheilk. (?), 1912, xii, 246, through Chem. Abs., 1913, vii, 1385.
7. R. Kobert: Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (2), 759, 1057.
8. T. A. Henry: The Plant Alkaloids, 1924, 2nd Edition, 427.
9. A. Tschirch: Handbuch der Pharmakognosie, iii (1), 263, 281, 304.
10. —. Wood (*prob.* J. Medley Wood): Through Flora Capensis, 1904, iv, 2, 102.
11. J. Medley Wood: Natal Plants, iv, Plate 352.
12. R. Marloth: The Chemistry of South African Plants and Plant Products, Cape Town, 1913, 13.
13. J. Burtt-Davy: 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 198, 199.
14. (*a*) G. Oddo and A. Colombano: Gazz. Chim. Ital., 1905, xxxv (i), 27, through Chem. Zent., 1905, i, 1251. (*b*) G. Oddo and A. Colombano: Ber. Deutsch. Chem. Ges., 1905, xxxviii, 2755. through

Chem. Zent., 1905, ii, 1182. (*c*) G. Oddo and A. Colombano: Atti R. Accad. dei Lincei Roma, 1905, xv, ii, 312, through Chem. Zent., 1906, ii, 1650. (*d*) G. Oddo and M. Cesaris: Gazz. Chim. Ital., 1911, xli (i), 490, through Chem. Abs., 1911, v, 3406. (*e*) G. Oddo: Gazz. Chim. Ital., 1911, xli (i), 534, through Chem. Abs., 1911, v, 3407. (*f*) G. Oddo and M. Cesaris: Gazz. Chim. Ital., 1914, xliv, (i) 680, through Chem. Abs., 1915, ix, 72.

15. United States Dispensatory, 1926, 21st Edition, 1484.
16. L'Union Pharmaceutique, 1861, 207, quoted in ref. No. 20.
17. J. M. Watt, H. L. Heimann, and E. Meltzer: J. Med. Assoc. So. Afr., 1928, ii, 298.
18. J. M. Watt, H. L. Heimann, and E. Meltzer: J. Pharm. Exp. Ther., 1930, xxxix, 387.
19. Maria G. Breyer-Brandwijk: Bull. Sci. Pharmacol., 1929, xxxvi, 541.
20. J. Martinenq: Thèse, Univ. Montpellier, 1901.
21. G. Barger: Private communication to J. M. Watt.
22. J. M. Watt and H. L. Heimann: Unpublished data.
23. Bull. Imp. Inst., 1916, xiv, 25.
24. E. P. Phillips: Bot. Survey of So. Afr., Memoir IX, 1926, 24.
25. J. M. Beyers: J. Med. Ass. So. Afr., 1930, iv, 102.
26. J. M. Watt and Maria G. Breyer-Brandwijk: J. Med. Ass. So. Afr., 1927, i, 603.
27. Bull. Imp. Inst., 1923, xxi, 58.
28. W. H. Chase: Rpt. of the Col. Vet. Surg. and the Assist. Vet. Surgeons for the Year 1903, Cape of Good Hope, G. 41—1904, 79.
29. W. Robertson: Rpt. of the Bacteriologist to the Agr. Dept. for the Six Months ended 30th June 1904, Cape of Good Hope, G. 41 *—1904, 48.
30. C. F. Juritz: So. Afr. J. Indus., 1922, v, 347, through Chem. Abs., 1922, xvi, 4006.
31. D. Hutcheon: Rpt. of the Col. Vet. Surg. for 1894, Cape of Good Hope, G. 42—1895, 10.
32. L. H. Walsh: South African Poisonous Plants, 1909, 47.
33. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., 1931, ii, 726.
34. J. F. V. Phillips: Private communication.
35. D. G. Steyn: J. So. Afr. Vet. Med. Ass., 1931, ii, 115.

CXII. SCROPHULARIACEAE

An infusion of **Aptosimum indivisum Burch.,** Carpet plant, Karoo violet, is taken by Europeans for gastric disturbances, and an infusion of **Aptosimum depressum Burch.,** Carpet plant, Karoo violet, Veld violet (Willowmore C. P.), Brandbossie, Braambossie, for retention of urine and difficulty in micturition. This latter infusion is also used by Europeans as a gargle in diphtheria, and formerly in the treatment of krimpsiekte in sheep.[1] In the Willowmore district the plant is used as a remedy for impetigo and ringworm by washing the lesions with a decoction and subsequent dressing with the dry, powdered plant.

The dried leaf of **Halleria lucida L.,** Witolyf, Ouhout, Zulu *i Ndomela*, Suto *lebetsa*, is stored by the Zulus and, when required, is moistened with water and the juice squeezed into the ear for the relief of earache. Suto children suck the juice from the leaf, and the Sutos use the plant as a charm against evil (Phillips). The fruit is said to be edible. It would appear, therefore, that neither leaf nor fruit is active.

According to Phillips, the Sutos rub the powdered burnt root of **Phygelius capensis E. Mey.,** Suto *mafifi-matsu*, *mafifi-matso*, *metsi-matso*, into incisions on the body to relieve numbness of the limbs. They also use the plant as a charm.

The Sutos apply **Manulea crassifolia Benth.,** Suto *fukuthwane*, *nohana-metsana*, to swollen umbilicus in infants (Phillips), and to relieve headache they wash the head in a lotion made from the leaf and branch of **Manulea paniculata Benth.,** Suto *lephophoma*, *bolao*, *'mamachorotsa* (Phillips). Phillips states that the latter is strongly emetic. The Sutos chew the raw root of a **Manulea sp.,** Suto *lebohlollo*, to relieve hiccup.

Sutera atropurpurea Hiern. (Lyperia crocea Eckl., Lyperia atropurpurea Benth.), Cape saffron, Saffraanbossie, Geelblommetjie, Suto *phiri-ya-hlaha-ya-loti*, is one of the commercial sources of *saffron*, though it is more commonly derived from **Crocus sativus L.** Pappe states that the flower was formerly used with success in the treatment of convulsions in children, and credits it with being anti-spasmodic, anodyne, and stimulant. The ancients and mediaeval physicians used saffron as a nerve sedative and an emmenagogue, but it is rarely used now except as a flavouring and colouring (yellow) agent.[2] In domestic medicine saffron tea has been given in the exanthemata with an idea that it promotes the development of the rash.[2] Sollmann [3] states that it has been used as an abortifacient, but according to Cevidalli,[4] it has no such action and is practically non-toxic.

Saffron is the stigma of **Crocus sativis L.,** although in South Africa the whole flower of **Sutera atropurpurea Hiern.** appears to be used. Saffron yields a *volatile oil*, *sugar*, and a glucoside, *crocin*, $C_{44}H_{70}O_{28}$, which is a yellow powder readily soluble in water and dilute alcohol. Crocin hydrolyses easily into *crocetin*, a red powder with the formula $C_{34}H_{46}O_9$ or $C_{15}H_{20}O_4$, and *crocose*, a dextro-rotatory sugar. *Picro-crocin* or *saffron bitter*, $C_{38}H_{66}O_{17}$, a colourless, glucosidal, bitter principle, has also been isolated. A colourless crystalline ketonic compound, $C_{10}H_{14}O$, has also been named picro-crocin. As much as 10 per cent. of the volatile oil has been isolated from saffron. It has the formula $C_{10}H_{14}O$, and boils at 208° to 210° C. It is a heavy, hot, acrid, bitterish oil. This account of the chemical composition of saffron is based on the statements given in the United States Dispensatory.[2]

The juice of the leaf of **Sutera pinnatifida Benth.** is a native remedy for local application to sore eyes in sheep. According to Phillips, the Sutos make a medicine for chest troubles from **Sutera brachiata Roth.,** Suto *mopota-mafika*, and **Senecio rhyncholaenus DC.,** and administer a root decoction of **Sutera floribunda O. Kuntze,** Suto *boduma*, to children with chest colds. The Sutos also use **Sutera filicaulis Hiern.,** Suto *mopota-mafika*, as a remedy for chest troubles (Phillips).

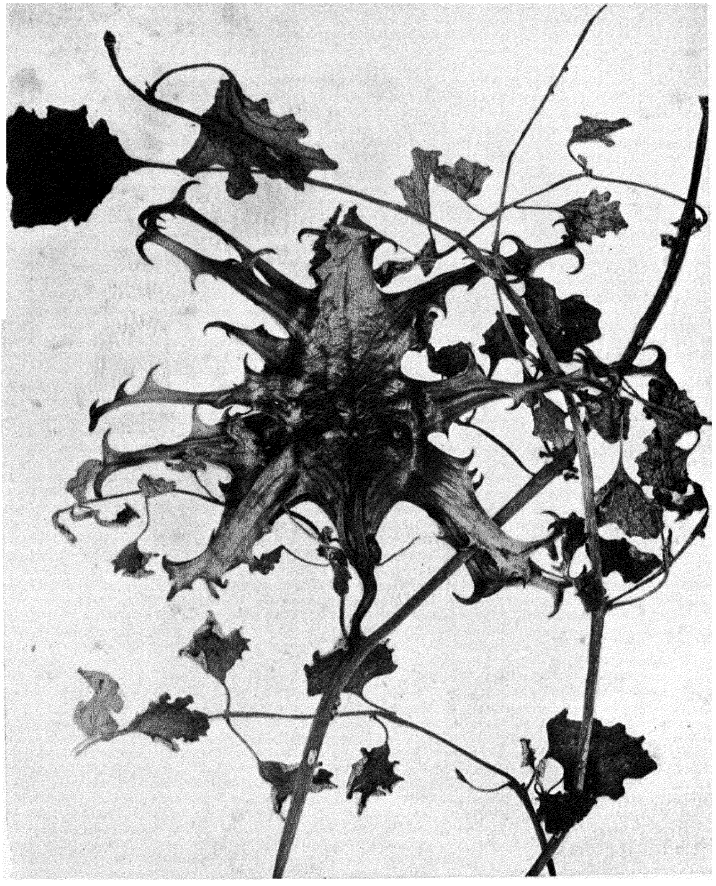
The Zulus administer an infusion of the leaf and stem of a **Sutera sp.,** Zulu *uMahokwe*, by the mouth or as an enema for feverishness, and the Sutos make mental patients inhale the smoke from burning the leaf of a **Sutera sp.,** Suto *letswalo*.

The Sutos use **Mimulus gracilis R. Br.,** Suto *sehlapetsu*, as a remedy for irregular menstruation, and make a lotion from it for bathing tired and feverish patients (Phillips). They also drink an infusion of the root of **Hebenstreitia comosa Hochst.,** Suto *lebohlollo*, *tsitwane*, for the relief of indigestion and stomach-ache. According to Phillips, they make a perfumed ointment by mixing the plant with fat.

Suto women take a decoction of **Sopubia cana Harv.,** Suto *pudumo-tsweu* and **Salvia runcinata L. f.,** to ward off a threatened miscarriage and to relieve painful menstruation (Phillips).

The Zulus drink an infusion of the root of **Cycnium racemosum Benth.** as an emetic when suffering from general pains in the body.

Harveya speciosa Bernh., Suto *lekxolêla-la-basotho*, *seona*, *mokunyi*, is a



FRUIT OF HARPAGOPHYTUM PROCUMBENS DC., SHOWING THE GRAPPLE-LIKE HOOKS.

Facing page 171.]

Suto remedy for madness (Phillips), and is also used by the Sutos in treating a person who has been bewitched by his relatives.

REFERENCES

1. D. Hutcheon: Rpt. by the Colonial Vet. Surg., Cape of Good Hope, G. 14—1887, 29.
2. United States Dispensatory, 1926, 21st Edition, 391.
3. Torald Sollmann: A Manual of Pharmacology, 1926, 3rd Edition, 64.
4. A. Cevidalli: Zt. Biochem. Biophys., 1914, xvii, 711, quoted in ref. No. 3.

CXIII. BIGNONIACEAE

The Sutos of the Northern Transvaal administer the powdered bark of **Tecomaria capensis Spach.,** Cape trumpet-flower, Kaffir honeysuckle, Transvaal Suto *molaka*, to cases of pneumonia and of high fever. It is said to relieve pain and to produce sleep. The bark is also taken in abdominal troubles. For bleeding of the gums, the powder is rubbed round the teeth.

Pijper records that in the Transvaal the burnt and powdered pips of **Crescentia cujete L.,** Kalabas, are taken internally and applied locally in cases of snake-bite.

Kigelia pinnata DC., Cucumber tree, Sausage tree, Zulu *umZingulu*, *umFongothe*, Tonga *mvumuti*, Nyasaland *umvunguti*, is a common tree in South Africa. The Tongas apply the powdered fruit as a dressing to ulcers (Stevenson-Hamilton), while the Zulus are also said to use the tree medicinally (Medley Wood). The ripe fruit is not edible (Stevenson-Hamilton), but is purgative.[1] The unripe fruit is used in Central Africa as a dressing in cases of syphilis and rheumatism. In Nyasaland, in times of scarcity, natives roast and eat the seeds.

REFERENCE

1. Rosenthal's Synopsis plantarum diaphoricarum, Erlangen, 1862, 494, through E. G. Santesson, Arkiv. f. Bot., 1926, 20A, 8.

CXIV. PEDALIACEAE

Harpagophytum procumbens DC. is known as Grapple plant, Wool-spider, Beesdubbeltjie, Kloudoring, Rankdoring, Tou (Toutjie), Chuana (?) *kanako*. The tuber, which attains a large size, is much prized as a medicine among Europeans, Bushmen, Hottentots, and some Bantus. Taken by the mouth, it is said to produce purgation. An infusion is taken for the relief of fevers of all sorts. The dried and powdered tuber is administered to pregnant women in doses of about 0·25 grm. thrice daily to relieve pain. The medication is continued *post partum*, but the dose is less. The fresh tuber is made into an ointment and applied to the abdomen of women who anticipate a difficult birth. The ointment is also applied to all manner of sores, ulcers, boils, etc., and even to external cancerous growths.

Mitchell [1] states that natives use **Sesamum indicum L.,** Sesame, Thunderbolt flower, Sem-sem, Gingilli, Suto *molekelela* (Oil=Sesame oil, Sem-sem oil, Teel

oil, Benne oil), as an aphrodisiac. Beyer records that the Sutos drink a decoction for malaria and chew the leaf instead of tobacco. The seed contains about 50 per cent. of *oil* and the leaf much *gum*.[2] Taken in large doses, the oil is purgative.[2] It is much used in the culinary art, particularly as a substitute for olive oil. The seed cake, after expression of the oil, is toxic to stock, causing colic, tremor, dyspnoea, and distension.[3] Kobert [3] states that the seed has been used since olden times as an emmenagogue and abortive.

In the Mufulira district of Northern Rhodesia, natives use a decoction of the leaf of **Sesamum calycinum Welw.** in the treatment of smallpox. It is applied to the skin, used for bathing the eyes, and as a nasal douche, and some of it is taken by mouth.

The Zulus administer an infusion of **Ceratotheca triloba E. Mey.,** Zulu *uDonqa*, *uDonqabatwa*, to relieve painful menstruation. Bryant states that they use the plant in gastric and intestinal disorders.

The Sutos give an infusion of the leaf of **Pretrea zanguebarica J. Gay.,** Devil's thorn, Dubbeltjiedoring, Duiwelsdis, Duiweltjies, Elandsdoring, Seepbossie, Suto *lepate*, to aid in the expulsion of retained placenta in women and animals. In Rhodesia the juice of the plant is given to cows as an aid to parturition. During the Boer War, the burgers used the plant as a soap substitute.

REFERENCES

1. J. A. Mitchell: Quoted by G. A. Turner, Transvaal Med. J., 1908-09, iv, 204.
2. United States Dispensatory, 1926, 21st Edition, 785, 1469.
3. R. Kobert: Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (1), 594.

CXV. ACANTHACEAE

A strong infusion of **Thunbergia dregeana Nees.,** Zulu *isiPhondo*, is taken by a Zulu man to cure problematical disease which he may acquire from intercourse with his wife if she has been "doctored" with the intention of affecting him. Medley Wood states that the Zulus make a hair-wash from the plant.

The leaf of **Thunbergia astriplicifolia Lindau.,** Natal primrose, Zulu *isiPhondo*, is much used by Zulus and Natal Indians in making a hair-wash.

The leaf of **Thunbergia capensis Thunb.,** Xosa *iYeza-lehashi*, is one of the Xosa applications to scrofulous swellings (Smith).

Crabbea nana Nees. (Crabbea cirsioides Nees.), Xosa *ubuHlungu-besigcawu*, is used by the Xosas in exactly the same way as **Blepharis capensis** (Smith). A decoction of the root of **Crabbea angustifolia Nees.** is administered by natives to wasting children. The burnt and powdered root of **Crabbea hirsuta Harv.,** Suto *letswejana*, *mereko*, is rubbed by the Pedis over the body of hydrocephalic children. Suto medicine-men use the plant in conjunction with the divining bones (Phillips).

The Pedis use a decoction of the root of a **Crabbea sp.,** Suto *maxasha-a-mokxopo*, in the treatment of gonorrhoea.

Barleria macrostegia Nees., Chuana *sephatla*, is taken by Chuana women

about the time of the climacteric. The Zulus administer a root decoction of a plant, *prob.* **Barleria ovata E. Mey.,** Zulu *uMathanjane*, by the mouth or as an enema, for the relief of a condition characterised by painful nodules under the skin.

Blepharis capensis Pers., Xosa *ubuHlungu-besigcawu*, is much used as an anthrax remedy by Europeans and Natives. A tincture has been extensively administered for this purpose in one of the large hospitals. Blaine [1] states that it produces benefit. The Xosas take a decoction by the mouth in snake-bite and toxic insect-bites, applying locally at the same time a paste of the leaves (Smith). They also apply the leaf as a toothache remedy (Smith).

In the Transvaal, natives rub the root of **Blepharis stainbankiae C. B. Cl.** on the skin to relieve itching. The Sutos take an infusion of **Blepharis espinosa Phillips,** Suto *mohlahalane*, *marapšane*, to relieve coryza (Phillips). A paste made from the fresh leaves of **Blepharis procumbens Pers.,** Suto *sehlaba-thšukudu*, is applied locally by the Sutos to relieve toothache (Beyer).

REFERENCE

1. B. Blaine: So. Afr. Med. J., 1897, v, 123.

CXVI. PLANTAGINACEAE

Plantago major L., Plantain, Broad leaf plantain, Wild sago, Rib grass, Ribwort, Ripplegrass, Platvoet, Weeblaar, Weegblaar, Weegbree, Groot weegbree, Zulu *inDlebe-ka-tekwane*, is much used as a medicine among Europeans and Natives. The Zulus squeeze the leaf juice into the mouth and ears, or administer a decoction of the root as an enema to "cleanse" the intestinal tract of new-born infants. The Xosas drink a similar decoction for diarrhoea. Europeans apply the leaf to tubercular ulcerations, but a medical confrère informs us that he has not observed any improvement from the application. The fresh leaf juice is highly spoken of among Europeans as a remedy for malaria. It is stated that the attacks rapidly cease and often do not recur. The taking of the remedy is said to be followed by much sweating. In the Transvaal, Europeans plug the ear with the leaf to relieve earache (Pijper).

The leaf of **Plantago major L.** is saline, bitterish, and acrid, and the root is saline and sweetish to the taste.[1] Overseas, the leaf has been much used as an application to sores,[1] and the ancients used the plant medicinally, apparently, as a diuretic and astringent.[1] In Japan a watery extract of the seed (*var.* **asiatica Dcne.**) is given for whooping-cough.[2] Pammel states that the seed is used as a food for small birds. The seed contains a glucoside, *aucubin*, *choline*, and *organic acids*.[2] Bourdier isolated *aucubin* from the leaf, inflorescence, root, and seed.[3] Aucubin occurs as colourless, odourless needles arranged in rosettes, and taste first sweetish then slightly bitter. It melts at 180·4° C., and is soluble in water and alcohol.[3] The seed yields as much as 22·08 per cent. of an edible non-drying *oil*, with an agreeable odour, the colour being from lemon-yellow to light green.[4] Marloth states that the seed is rich in starch and slime,

and has been used like sago. The pharmacological action of aucubin has apparently been at least partially investigated, but we can give no details as we have not seen the publication.

According to Wicht, small pieces of the root of **Plantago lanceolata L.**, Lamb's tongue, Ribwort, Ribgrass, Wild sago, Weegblaar, Smal weegbree, are introduced into the external auditory meatus for the relief of earache. In the Transvaal (Pijper) and overseas,[1] the plant is used in the same way as Plantago major L., and is stated to have the same properties.[1] All parts contain *aucubin*,[3] for particulars of which see Plantago major L.

The leaf juice of **Plantago dregeana Presl.**, Plantago, Plantain, Weeblaar, is used by Europeans in the treatment of malaria.

Smith records that the Xosas apply the leaf of **Plantago sp.** to sores.

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1432.
2. O. Ogata and R. Nishioja: J. Pharm. Soc. Jap., 1924, No. 514, 1040, through Chem. Abs., 1925, xix, 1726.
3. L. Bourdier: (1) Arch. der Pharm., 1908, cxlvi, 81. (2) J. Pharm. Chim., 1908 (6), xxvi, 254.
4. Chem. Abs., 1921, xv, 2991.

CXVII. RUBIACEAE

Oldenlandia amatymbica Kuntz., Suto *mohatollwane*, *mohlatsisa*, *morokolopodu*, *matswane*, *lehlokwana*, *mangwakwane*, is one of the Suto remedies for sterility. An infusion is used also as an emetic in cases of snake-bite and lightning-stroke. Phillips states that the Sutos give a decoction to wasting children.

According to Bryant, the Zulus take a decoction of the root of **Oldenlandia decumbens Hiern.**, Zulu *uMampeshana*, for shortness of breath in asthma and in heart disease. The Zulus take an infusion of **Oldenlandia** (**Hedyotis scabrida Sond.**), Zulu *isiMalisane*, as an emetic before going out courting.

The fresh berries of **Cephalanthus natalensis Oliv.**, Far-far tree, Quinine berry, are eaten by Europeans and Natives in the Kaapsche Hoop district as a treatment for fevers, especially malaria. The dose is three to four berries several times a day. A medical observer states that the treatment produces no appreciable effect. Actually, the berries are used in making a conserve for table use. They are probably without medicinal action.

The fruit of **Randia dumetorum Lam.**, Ronga *cherole*, is said to be toxic to fishes. This plant apparently is very common in Moçambique (de Almeida).

The Rotses and neighbouring tribes rub the powdered root of **Gardenia globosa Hochst.**, September bells (Natal), Zulu *isiQoba*, Kololo *muwiwi*, Wiko *munjongolo*, into incisions in the skin over the affected parts in leprosy. The Marozi and subject tribes use **Gardenia rothmannia L.**, Candlewood, Kershout, Aapse kos, Kololo *munyanya*, Wiko *lioko*, in the treatment of rheumatism by rubbing the powdered root into incisions in the skin over the affected parts and by heating and smoking the parts over the burning root. The Vendas heat the fruit of **Gardenia rothmanniana L. f.**, Venda *muratha-mapfene*,

mukudubu, and squeeze the juice on to burns and wounds. The Zulus take an infusion of the root-bark of **Gardenia thunbergia L. f.**, Wild gardenia, Wilde katjiepiering, Stompdoring, Bobbejaangif, Zulu *uMvalasango*, *uMvalasangwane*, as an emetic in biliousness.

Pentanisia variabilis Harv., Wild verbena (Natal), Zulu *iZimamlilo*, *iCimamlilo*, *isiCimamlilo*, *isiCitshamlilo*, *iCitshamlilo-omncane*, *iCitshamlilo-omkhulu*, Xosa *iRubuxa*, Tembu *iDliso*, Fingo *isiCimamlilo*, Lamba *insanki*, Suto *setimo-mollo*, is much used medicinally. The Zulus take an infusion of the root as an enema for stomach pains. They apply either a poultice of the leaf or a hot decoction of the root to painful swellings, rheumatic parts, sprains, sores, and in fevers generally, and use the root internally and externally to arrest the emetic effects of "*imFuzane*" (not determined). The leaf poultice is often applied by the Zulus to the abdomen for retained placenta. Bryant records that the Zulus use the root as a pile remedy and a warm infusion of it as an enema for "gangrenous rectitis." The Sutos drink a decoction of the root in the treatment of venereal diseases. According to Phillips, the Sutos soak a limb affected with boils in a decoction of the root. This is said to aid in the discharge of pus. A lotion of the plant is applied to the breasts of a recently confined mother, and is used to bathe feverish patients. They also use the plant to weaken the effect of an enema of **Dierama pendula Bkr.** In the Eastern Transvaal, both Zulus and Sutos drink a decoction of the root to relieve pain in the chest, itching, and "impurity of the blood" (syphilis (?)). In the Transvaal, natives add a decoction of the plant to the bath to enhance its refreshing qualities. The Xosas take a decoction of the root for the relief of distension of the abdomen, and administer a similar preparation to aid the expulsion of retained placenta in both man and animal. The plant is also a Xosa tuberculosis remedy. It enters into the composition of a Zulu and Swazi remedy for "blood ailments," and is used as a charm by the Sutos. Marloth [1] calls **Pentanisia sp.** "Ipecac. substitute," but we can find no basis for this statement.

The fruit of **Vangueria infausta Burch.**, Wild medlar, Mispel. Pedi *mmilo*, Zulu, Ronga and Swazi *umVilo*, Lamba *leyambaso*, *yinanana*, Tonga *mpfilu*, Karanga and natives of Nuanetsi in the Chibi district *mvilo*, Ronga and Swazi *umFilwa*, *inFaylo*, *mavelo*, is eaten by the Pedis, the Lambas, and the natives of Moçambique. A decoction of the root is in common use among natives in the Union as a remedy for menstrual troubles, while the Lambas take an infusion of the root in the treatment of cough and other chest complaints. The natives of Nuanetsi (Chibi district, Southern Rhodesia) use the root mixed with two other plants for malarial fever and pneumonia.

Pole-Evans [2] in 1920 pointed out that **Pachystigma pygmaea (Schltr.) Robyns** (Vangueria pygmaea Schltr.), Witappeltjie, Gousiektebossie, causes, on the high veld during certain seasons, heavy mortality among sheep. Theiler, du Toit, and Mitchell [3] in 1924 investigated the relationship between this plant and *gousiekte*, a disease of sheep first described by Walker.[4] The former proved experimentally that ingestion of the plant produces the disease. It is called gousiekte from the fact that death is often very rapid and unexpected. The affected sheep often show little in the way of symptoms,

but suddenly, especially when handled or chased, drop dead. Frequently they are found dead in the kraal in the morning. Less acute cases are observed. The toxicity of the plant varies considerably, and the individual susceptibility of sheep to the toxin also varies. The mortality rate is high. The essential pathological change is the development of a fibrotic myocarditis, which results in replacement of muscle by fibrous tissue and atrophy of the surviving muscle fibres. The heart walls are greatly thinned and the chambers usually dilated. The heart is therefore much larger than normal. The sheep dies of an acute failure of the circulation. The liver, kidney, and spleen show circulatory stasis and some cloudy swelling and fatty degeneration.

The Zulus, according to Bryant, swallow the powdered leaf of **Vangueria lasiantha Sond.,** Wild medlar, Zulu *uDulamuthwa*, *umVilo*, for the treatment of diarrhoeas and dysenteries. Medley Wood states that the fruit is edible.

Among the Kxatlas, a **Vangueria sp.,** Kxatla *mmilo*, is one of the ingredients of a " medicine " used to promote the fertility and well-being of cattle (Schapera).

Pygmaeothamnus zeyheri Robyns. (Vangueria zeyheri Sond.), Chuana and Kwena *mothlabelo*, is made into an ointment by the Chuanas and Kwenas. This is rubbed into scarifications on swollen legs to reduce the swelling.

In Southern Rhodesia, natives chew the root of **Fadogia obovata N. E. Br.,** and spit the saliva on to the eyeballs of people who have received the venom of the ringhals cobra in that situation.

According to Phillips, the Sutos use the leaf and bark of **Plectronia ciliata Sond.,** Skaapdrolletjie, Suto *meqwane*, *seeqane*, *kxweha*, *moqapane*, as an enema for the relief of abdominal pain caused by the presence in the intestine of " small dung beetles " (introduced by witchcraft).

Pavetta canescens DC., Chikalamba *chitapatapa*, is a Wemba headache and snake-bite remedy.

The Chuanas and Kwenas hold a decoction of **Anthospermum rigidum E. and Z.,** Chuana and Kwena *thaxathuxane*, Suto *phakisane*, *potsana*, in the mouth to relieve toothache. The Sutos administer an infusion of the stem and root to horses suffering from " lung-sickness " (Phillips).

The root of **Anthospermum pumilum Sond.,** Suto *phakisane*, *masopolohane*, is a Suto remedy for painful menstruation. It is also used during the course of pregnancy. Phillips states that the plant enters into the composition of many Suto medicines.

The Chuanas and Kwenas add a decoction of an **Anthospermum sp.,** Chuana and Kwena *monyelle*, to the bath as a tonic during convalescence.

The root of **Richardsonia pilosa H. B. and K.,** White ipecacuanha, is said to be emetic. Rabbits and fowls are fond of the herb.

An infusion of the root of **Borreria (Spermacoce natalensis Hochst.),** Zulu *isiMuyisane*, is taken by the Zulus to stop the emetic action of " *imFuzane* " (not determined). Bryant mentions that they use the root in the form of an enema in the treatment of " gangrenous rectitis."

A decoction of the root of **Galium wittebergense Sond.,** *var.* **glabrum Phillips,** Suto *morara-o-mofubedu*, *morarana-wa-mangôpe*, *seharane*, is used by the Sutos as a purgative for pregnant women (Phillips).

According to Phillips, decoctions of the roots of **Galium dregeanum Sond.** *forma*, Suto *seharane*, and **Galium rotundifolium L.,** Suto *moriri-wa-lehala*, *lefero*, are used by the Sutos as a remedy for colic, sore throats, and chest complaints. The preparations also enter into the ritual of Suto doctors.

A decoction of the root of **Galium sp.** is taken by the Transvaal Sutos and Shangaans for the treatment of bilharzia.

The Chuanas drink a decoction of the root of **Rubia petiolaris DC.,** Rooistorm, Rooistam, Rooihoutjies, Pedi *kgagarotsane*, Suto *mmatšane*, for kidney diseases. Among the Pedis, when coitus with a menstruating woman results in pain in the abdomen (the woman is said to *khutla* the man), the condition is treated by the administration of the root along with *lebitsi*, **Mylabris oculata Thunb.** (Watt and van Warmelo). This treatment is effective in removing this particular type of pain only. The Pedis also take an infusion or a decoction of the stem for gravel, and use the root as a dusting powder. According to Smith, the Xosas use a decoction of the root, which is red, in dysenteries, sometimes made with the addition of the root of **Solanum capense Thunb.** They also administer an infusion of the root with the root of **Silene burchellii Ott.** to cases of tuberculosis (Smith). The root is also a Suto dysentery remedy (Beyer).

In the Cape Province, natives take a decoction of the leaf or root of **Rubia cordifolia L.,** Suto *seharane, mohlatswa-meno, imPindisa*, for pleurisy and other inflammatory conditions of the chest. It is said to relieve pain. According to Phillips, the Sutos use a decoction of the root to relieve colic, sore throats, and chest complaints, and to wash the teeth. Zulu men take a similar decoction to cure lack of seminal emission, and adolescent Zulu females take a preparation of the root to hasten the inception of menstruation and in the treatment of overdue menses (Bryant). He states that over-eager girls will even eat the raw root.

A supply of the root from Natal has been tested for its " madder " content, and has been found to compare very favourably with Kashmir root and with that of **Rubia tinctoria L.**[5]

REFERENCES

1. R. Marloth : The Chemistry of South African Plants and Plant Products, 1913, 6.
2. I. B. Pole-Evans : So. Afr. J. Sci., 1920, xvii, 19.
3. A. Theiler, P. J. du Toit, and D. T. Mitchell : 9th and 10th Rpts. Dir. Vet. Educ. Res., Union of South Africa, 1924, 9.
4. J. Walker : Rpt. Gov. Vet. Bact., 1908-09, Transvaal Dept. Agr., 74.
5. Bull. Imp. Inst., 1918, xvi, 13.

CXVIII. VALERIANACEAE

Pappe states that the root of **Valeriana capensis Thunb.,** Balderjan, Wilde balderjan, Suto *motetele*, resembles that of **Valeriana officinalis L.,** and is used in the same way, viz., in epilepsy, hysteria, and other conditions of the nervous system. He mentions also that it is used in the treatment of typhoid fever, to expel intestinal worms, and as a diaphoretic. Wicht notes the use of the root in place of the official variety, and records that it is used externally and

internally as an irritant. Internally it is supposed to stimulate the alimentary tract, the bronchial mucosa, the kidneys, and the circulation, the last named reflexly from irritation of the gastric mucous membrane. According to Phillips, the Sutos burn the leaves in the hut of a sick person to drive away the illness.

CXIX. DIPSACEAE

A decoction of the root of **Cephalaria ustulata R. and S.,** Zulu *uZondhle*, Suto *thswene* (*var.* **pilosa**), is a Zulu " blood purifier " (syphilis) (?). The Zulus take it also for the treatment of any unaccountable swellings and pains. The variety, **pilosa,** is used by the Sutos as a charm (Phillips).

The Chuanas use a decoction of the root of **Scabiosa transvaalensis S. Moore** as an eye lotion for sore eyes.

Scabiosa columbaria L., Wild scabious, Pincushion, Rice flower. Bitterbossie, Suto *selomi*, *thlaku-sa-pitsi*, Xosa *iYeza-lamehlo*, is a popular medicine among natives. The Sutos take a decoction of the root for colic, and Suto herd-boys often chew the fresh plant for the same purpose. In the Lichtenburg district, natives chew the root to relieve heartburn, while the Free State Sutos take the powdered root for colic. We are informed by a medical practitioner that he has found a decoction of the root in half-ounce doses effective in relieving this condition. A decoction of the root enters into the composition of a Suto remedy for sterility. An ointment made from the charred root and kerosene is applied by the Sutos to venereal sores. According to Phillips, the Sutos use the plant along with **Rhus divaricata E. and Z.** and **Cussonia paniculata E. and Z.** for the relief of colic and painful menstruation and in cases of difficult confinements. The Xosas use a preparation of the root as an application to sore eyes (Smith, Hewat). The dried plant is in common use among natives as a perfumed dusting powder, especially for infants. The powder is known as *makgha*.

CXX. CUCURBITACEAE

Melothria punctata (Thunb.) Cogn. (Pilogyne ecklonii Schrad., Coniandra scabra, Zehneria punctata, Zehneria scabra Sond., and Bryonia punctata Thunb.), Dawidjieswortel, Dawidjies, is suspected of being poisonous. On the other hand, there are no records of poisoning under field conditions,[1] and Phillips records that feeding tests on sheep were negative.[2] Curson [1] states that, despite the fact that the plant has a disagreeable odour when crushed, and an unpleasant taste, it is readily eaten by stock, particularly by cattle, during autumn and winter when green food is scarce. Cases of suspected poisoning by this plant develop scouring and show gastro-intestinal irritation *post mortem*. Experimentally, the intravenous injection of a tincture of the leaf produces severe purging and death.[1] Pappe records that the root is an old Hottentot remedy. He states that it has a nauseous taste, and that a decoction is emetic, cathartic, and diuretic. Natives formerly used the root in skin conditions, syphilis, and dropsy.

Melothria velutina Cogn., Suto *monyaku*, is possibly used as a purgative by the Pedis (Watt and van Warmelo).

The Sutos use **Pisosperma capense Sond.,** Suto *sesepa-sa-dinoha*, as a remedy for colic and to keep snakes away from habitations (Phillips).

Thunberg and Bowie record that the early colonists used the root of **Kedrostris nana Cogn.,** *var.* **latiloba Cogn.** (Bryonia africana Thunb.), Bryony, as an emetic. He notes that an infusion in wine or brandy was an excellent purgative.

The seed of **Telfaria pedata Hook.** gives a good yield of a viscous, slightly reddish-brown, non-drying *oil*. Thoms [3] isolated 64·71 per cent. from the kernel and 33 per cent. from the complete seed, Sadebeck [4] 36·02 per cent. apparently from the whole seed, and the Imperial Institute [5] 56·9 per cent. from the kernel. The oil is suitable for soap- and candle-making. Thoms [3] states that the shell, more particularly the bast, contains a *bitter* crystalline substance and abundance of a *tannin*. The presence of the bitter substance is confirmed by Krusemark [6] and the Imperial Institute.[5] Thoms states that, if the oil is obtained by expression, it does not contain the bitter substance and is therefore edible, but this view is not supported by the Imperial Institute and Sadebeck. The cake left, after expression of the oil, is useless for stock feeding on account of its bitterness.[7] The oil has a pleasant, slightly sweetish taste,[5] but gives off an unpleasant odour when used in cooking.[6] In East Africa, natives use the oil in preparing food and as a medicine in stomach troubles and rheumatism.[6] Pammel states that the plant is taenicide.

The fruit pulp of **Acanthosicyos horrida Welw.,** Naras, Narras, is rich in protein,[8, 9] and in sugar,[10] and is eaten by the Hottentots and Bushmen near Walfish Bay, in South-West Africa.[8, 9, 10] The seeds, which are known in South Africa as "butterpits," are also eaten,[8, 9] and used in baking.[9, 11] Ether extracts from them 44·28 [9] to 46·30 [11] per cent. of a light yellow, non-drying *oil* of very mild taste, which Grimme states could compete with almond oil.[11] The cake contains 61·3 per cent. of *protein*.[11] The fruit pulp [8] and the plant sap [10] contain an *enzyme* which curdles milk. This enzyme is non-volatile,[8] and is destroyed by heat like other enzymes.[12] The unripe fruit, root, and twig are intensely bitter, and the latter two have been used medicinally.[9]

Overseas, a liniment made by infusing in olive or almond oil the fruit (minus seeds) of **Momordica balsamina L.,** Balsam apple, Balsamina, Tonga *nkaka*, is used as an application to chapped hands, burns, haemorrhoids, etc., and the mashed fruit is applied as a poultice.[13] An extract has been used in dropsy.[13] A few drachms of the fruit is fatal to a dog when given orally,[13] while Pammel states that the plant is emetic. The Tongas eat the plant (de Almeida). The plant occurs in Zululand, and is probably used by the Zulus in the same way as the two following. According to Bryant, the Zulus take an infusion or a decoction of the runners of **Momordica foetida Schum.,** Zulu *in Tshungu*, and **Momordica involucrata E. Mey.,** Zulu *in Tshungwana-yehlathi*, as a sedative for irritable stomach. They also drink a decoction of the root or leaf of **Momordica cordifolia Sond.,** Zulu *in Tshungu*, in the treatment of boils. The preparation is made with the addition of **Pittosporum viridiflorum Sims.** and **Vernonia natalensis Sch.-Bip.**

Momordica charantia L. (Cucumis africanus Lindl.), Wild cucumber, Bitterappel, is said to be anthelmintic and emetic (Pammel). In Brazil the seed is administered as an anthelmintic, dose two to three seeds. The anthelmintic action is said to reside in the embryo.[33] The seeds yield 32 per cent. of a purgative oil.[33]

The Zulus use an infusion of the root or leaf of **Luffa sphaerica Sond.**, Zulu *uSelwa*, for stomach-ache (Bryant). It appears possible that they may sometimes use **Luffa cylindrica Roem** (Luffa aegyptiaca Mill.), Vegetable sponge, Wash-rag sponge, Gourd towel, Sponge gourd, in place of it. The fruit juice of the latter is a drastic purgative,[14] and is toxic.[30] The moisture-free kernels of *var.* **lissa** yield 45·72 per cent. of a mild, agreeable, brownish-green, semi-drying oil, rich in protein and phosphoric acid.[31] The presence of protein and phosphoric acid make the oil possibly useful as a fertiliser. The oil-cake cannot be used for feeding stock on account of its bitterness and possible toxicity.[31] *Var.* **macrocarpa** is similar.[31]

Citrullus vulgaris Schrad. is known as Water-melon, Wild water-melon, Kaffir water-melon, Tsamma, Tsamma water-melon, Bitter melon, Wild coloquint, Bitterappel, Bitter boela, Bitterosse, Karkoor, Koorkoor, Cocorico (Congo Belge), Suto *tjoto, thoomo, makakabane*. The Sutos use the cooked young plant as a vegetable and the fruit as a charm (Phillips). In the Kalahari the seed is used as a food by grinding and making into bread.[15] It yields 37·5 per cent. of a non-drying *oil*,[16] which Power and Salway [17] state is similar to pumpkin-seed oil. Both the fruit pulp and the seed have been credited with diuretic properties, though there is no convincing proof that they contain any medicinally active ingredient.[13] Pappe states that the fruit pulp is a drastic purgative, and was formerly used in the Western Province as a cathartic in dropsy and other complaints. It is intensely bitter. Payne [18] gives an analysis of the mineral-content of water-melon. A patented preparation of water-melon seeds is known as "*cucurbocitrin*," [19] but the use is not given.

The fruit pulp of **Citrullus amarus Schrad.** (Citrullus vulgaris, *var.* amara (?)), Wild coloquint, Bitter melon, Wild water-melon, Bitterappel, Bitter boela, Bitterosse, Karkoor, Koorkoor, is a drastic purgative, and was formerly used in the Western Province as a cathartic in dropsy and other complaints (Pappe). The fruit is intensely bitter.

The Bushmen use the juice of the root of **Citrullus caffer Schrad.**, Spiked cucumber, Kaffir-waterlemoen, Kaffer-watermeloen, in preparing the grub of **Diamphidia simplex** as an arrow poison.[20] The juice is probably without action and is used purely for its cohesive property. According to Pappe, both Europeans and Natives formerly ate the pickled fruit despite its bitterness.

The fruit of **Citrullus naudinianus Hook.**, a variety of pumpkin found in South-West Africa and the Kalahari, is said by Tschirch to be bitter, while Grimme [11] states that it is very juicy and has a pleasant acidulous taste. The seed kernel yields to ether 15·35 per cent. of a thin, yellow, non-drying *oil*, the residue containing 19·96 per cent. of *protein*.[11]

Citrullus colocynthus Schrad., Bitter cucumber, Bitter apple, Colocynth, the source of the well-known purgative colocynth, occurs at the Cape. The purgative action is confined to the fruit pulp, and the seeds are inactive.[22]

For long it was thought that the active principle was glucosidal in character. Walz and Speidel both isolated an intensely bitter glucoside, *colocynthin*, $C_{56}H_{84}O_{23}$ (Walz) [23] or $C_{98}H_{140}O_{34}$ (Speidel).[24] Power and Moore [25] found the merest trace of glucoside, but ascribe the purgative action of the pulp primarily to the presence of an intensely bitter, weakly basic, amorphous *alkaloid*, which in a dose of 0·1 grm. produces very drastic purgation in a dog. They obtained a second purgative principle which is non-basic and extractable by ether and chloroform. This principle is less active than the alkaloid.

The Sutos use the fruit pulp of **Cucumis myriocarpus Naud.** (Cucumis prophetarum L. and Cucumis colocynthis Thunb.), Wild cucumber, Bitter apple, Bitterappel, Gifappel, Suto *monyaku*, Kwena and Chuana *thlare-sa-mpja*, as a purgative. It has caused frequent deaths, probably from overdose. The Sutos ascribe the deaths to the accidental inclusion of seeds in the medicine. This is interesting in relation to the work of Quin, mentioned later. According to Phillips, the Sutos also use a decoction of the plant to purify a man who is about to marry a widow, if she has not undergone the necessary rites. The Kwenas and Chuanas administer the plant with milk to dogs for the relief of vomiting. The preparation purges. According to Quin,[26] the fruit juice, fresh or desiccated, is highly toxic to guinea-pigs, rabbits, and sheep, producing death in a few hours. Dogs quickly vomit the juice, but frequently suffer from haemorrhagic diarrhoea for several days thereafter. The seed and rind freed of pulp and juice are non-toxic, and the green fruit is less bitter and less toxic than the ripe. Pammel [27] states that the plant is emetic and purgative, and contains a toxic alkaloid, *myriocarpin*. Atkinson [28] in 1887 isolated a neutral resinous body which he named *myriocarpin*, and found that 1·3 grm. of the fresh pulp produces in man nausea and mild purgation. Quin [26] confirms Atkinson's work, for he has isolated a nitrogen-free, non-glucosidal substance which he thinks is probably resinous in nature. The ripe fruit contains 0·04 per cent., unripe fruit much less. The principle is bitter, insoluble in water, but soluble in alcohol. It is highly toxic to animals, given orally, subcutaneously, or intravenously.

The symptoms and *post-mortem* findings vary as the juice or active principle is given by the mouth or injected. When they are administered by the mouth, the animal frequently dies, with no other symptom than depression, though sub-lethal doses usually produce diarrhoea. *Post mortem*, such animals show a marked haemorrhagic gastro-enteritis, with often an accumulation of what appears to be coagulated blood plasma in the pyloric end of the stomach and the gastric end of the small intestine. Large toxic doses, given by the mouth, kill by producing an acute pulmonary oedema, the gastro-enteritis being less marked. Subcutaneous injection of minute doses of the active principle results in widespread oedema round the point of application. The reaction is not an inflammatory one, and the tissues are found to be infiltrated with a clear fluid which coagulates on exposure to the air. Lethal doses, either subcutaneously or intravenously, produce marked dyspnoea, accompanied by a cyanosis which becomes progressively more marked. Such animals die within one or two hours from asphyxia, with the copious escape of white frothy coagulable material from the respiratory tract. Dogs frequently show vomiting and diarrhoea

only. *Post mortem*, there is hydrothorax and very marked oedema of the lungs. The blood is concentrated, cyanotic, and slow in coagulating. The liver and kidneys are congested, as is the gastro-intestinal canal to a less extent.

Smith states that Xosa witch-doctors use a decoction of the leaf or root or the fruit juice of **Cucumis africanis L. f.,** Wild cucumber, Wilde komkommer, Agurkie, Xosa *uThangazana*, as an emetic charm, and says the plant is dangerous. Hewat records that natives take an infusion of the plant orally or per rectum in the treatment of dropsy, and mentions that the preparation acts as a hydragogue cathartic. Quin [26] finds that the fruit pulp has the same action as **Cucumis myriocarpus Naud.,** and that it contains the same resinous principle. The yield of this is one-third to one-half of that obtained from the latter.

Bryant states that **Cucumis hirsutus Sond.,** Suto and Pedi *monyaku*. Zulu *uThangazana*, is a dangerous poison, and that the Zulus take a decoction of the root, made with the addition of the root of **Aster asper L.,** for chronic cough. According to Phillips, the Sutos use a **Cucumis sp.,** *near* **Cucumis hirsutus Sond.,** in the same way as **Cucumis myriocarpus Naud.**

The Luvale, Wiko, Chibokwe, and Lojazi of Northern Rhodesia use the root of **Cucumis naudinianus Sond.,** Wilde komkommer, Agurkie, Kololo *lungwatanga*, Wiko *mungungwa*, as a poison for homicidal purposes. After ingestion, it is said to produce swelling of the abdomen, pain in the testicles, and death within twenty-four hours. Drying of the root does not reduce its potency.

The Sutos use a decoction of the fruit of **Cucumis dissectifolius Naud.,** Suto *monyaku, lerakana*, as an enema in diarrhoea. They also administer a preparation of the root to dogs for chest troubles and to human beings in the treatment of tumours. They state that the preparation must be used with circumspection, as it is highly poisonous (Phillips).

The pips of **Cucumis sativus L.,** Cucumber, Komkommer, are used by Europeans in the Transvaal as an anthelmintic (Pijper). The juice enters into the composition of cosmetic preparations, when its chief function is to impart its characteristic odour to them.

An infusion of the fruit of **Cucumis sp.** (*corresponding to So. Afr. National Herbarium No.* 7962), Zulu *uMaselwane, iSende-lenja*, is drunk by the Zulus as a purgative and to relieve abdominal pains. The Jindwes of the Umtali district of Southern Rhodesia administer to women a decoction of the root of a **Cucumis sp.,** Wild cucumber, Jindwe *mukakashango*, for the relief of "after pains" following on parturition.

Cucumis ficifolius A. Rich. (Cucumis figarei Del.) is used for homicidal purposes by the natives of Southern Rhodesia. It has been proved to be toxic by test on animals, the *post-mortem* examination revealing intense inflammation and swelling of the gastro-intestinal tract.[29]

Pammel [27] records that **Cucumis metuliferus E. Mey.** is toxic, the leaf containing a *saponin*.

The Nyanjas of Nyasaland give an infusion of the root of **Coccinia palmata Cogn.,** Nyanja *chikaka*, to infants for gastric upsets. The root, which is stated to have a flavour like the potato, is eaten in times of famine.

Coccinia (Cephalandra sessilifolia Sond.), Suto *borobohlolo*, is said to be toxic.

REFERENCES

1. H. H. Curson: 13th and 14th Rpts. Dir. Vet. Educ. and Res., Union of South Africa, 1928, i, 206, 207, 218, 221.
2. E. P. Phillips: Botanical Survey of South Africa, Memoir IX, 1926, 14.
3. H. Thoms: Notizbl. d. k. botan. Garten u. Mus. Berlin, 1898, No. 15, 5111, through Chem. Zent., 1899, i, 73.
4. —. Sadebeck: Kulturgewachse der deutschen Kolonien und irhe Erzeugnisse, Jena, 1899, 245, through ref. No. 5.
5. Bull. Imp. Inst., 1912, x, 223.
6. O. K. Krusemark: Rev. Fett.-Harz.-Ind., xiv, 225, through Chem. Abs., 1908, ii, 195.
7. Bull. Imp. Inst., 1924, xxii, 216.
8. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 13.
9. W. Versfeld and G. Frederick: So. Afr. J. Sci., 1915, xii, 232.
10. C. Grimme: Tropenpflanzer, xiv, 297, through Chem. Abs., 1911, v, 2120.
11. C. Grimme: Chem. Rev. Fett.-Harz.-Ind., xvii, 156, 178, through Chem. Abs., 1910, iv, 2886.
12. R. Marloth: The Chemistry of some Vegetable Products of South Africa, Cape of Good Hope Dept. Agr. Bull., xiii, 1909.
13. United States Dispensatory, 1926, 21st Edition, 1235, 1385, 1526.
14. R. Kobert: Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (1), 562.
15. Bull. Imp. Inst., 1925, xxiii, 149.
16. Bull. Imp. Inst., 1918, xvi, 399.
17. F. B. Power and A. H. Salway: Pharm. J., 1905 (?), lxxiv, 760.
18. G. F. Payne: J. Amer. Chem. Soc., 1896, xviii, 1061, through Chem. Cent., 1897 (1), 295.
19. I. S. Barksdale: U.S.A. Pat. 1,321,626, 26th April 1927, through Chem. Abs., 1927, xxi, 2052.
20. I. Schapera: Bantu Studies, 1926, ii, 205.
21. A. Tschirch: Handbuch der Pharmakognosie, 1917, ii (2), 1610.
22. R. Magnus: Drastische Abführmittel in Handbuch der experimentellen Pharmakologie, 1924, ii (2), 1647.
23. —. Walz: Neues Jahrb. f. Pharm., 1858, ix, 16, through ref. No. 22.
24. —. Speidel: Diss. Erlangen, through ref. No. 22.
25. F. B. Power and C. W. Moore: J. Chem. Soc. Trans., 1910, xcvii, 99.
26. J. I. Quin: (*a*) So. Afr. J. Sci., 1928, xxv, 242; (*b*) 15th Rpt. Dir. Vet. Serv., Union of South Africa, 1929, ii, 769.
27. L. H. Pammel: Manual of Poisonous Plants, 1911, 750, 818.
28. G. A. Atkinson: Amer. J. Pharm., 1887, through ref. No. 13.
29. A. W. Facer, Government Analyst, Southern Rhodesia: letter dated 30th January 1931 to J. M. Watt.
30. A. Gomes de Almeida: Bol. Agr. e Pecuário, 1930, i.
31. Ann. Mus. Col. Marseille, 1928, xxxvi, 4th ser., iv, 1, through Bull. Imp. Inst., 1929, xxvii, 109.
32. G. Beyer: Festschrift Meinhof, 1927, Hamburg, 278.
33. F. W. Freise: Apoth. Ztg., 1929, xliv, 1480, through Qtly. J. Pharm. Pharmacol., 1930, iii, 123.

CXXI. CAMPANULACEAE

The root of **Wahlenbergia banksiana A. DC.,** Suto *moopetsane*, is a Suto remedy for application to syphilitic sores. The Sutos use **Wahlenbergia androsacea A. DC.,** Suto *tenane*, as a spinach, and a decoction of it for intestinal ulcerations in children (Phillips). According to Pappe, **Wahlenbergia procumbens D. C. fils.** is emollient, and was formerly used as an ingredient in poultices. The Zulus use a decoction of **Wahlenbergia undulata A. DC.,** Suto *moopetsane*, *letwao*, *tenane*, as an eye lotion (Medley Wood).

The tubers of **Cyphia cardaminus Willd.,** Baree, Kambroo, are eaten by natives. They are said to be cooling and to have a diuretic effect. In the Transvaal, Europeans soak **Cyphia spp.,** Borrie, in brandy and use it as a liniment for body pains (Pijper).

Pappe states that the resinous root of **Lobelia pinifolia L.,** Blue lobelia, is stimulant and diaphoretic, and that a decoction of it was used as a remedy for skin diseases, chronic rheumatism, and gout.

CXXII. COMPOSITAE

The Zulus use **Ethulia conyzoides L.,** Zulu *umSokosoko*, as a remedy for intestinal parasites, for abdominal disorders, and for colic (Bryant).

Zulu women take a decoction of the bulb of **Vernonia corymbosa Less.,** Zulu *u Hlunguhlungu*, and the root of " bracken fern " (*prob.* **Pteridium aquilinum Kuhn.**) for menstrual irregularity and as an abortifacient. Bryant states that they use the former alone to facilitate delivery or to determine its onset.

An infusion of **Vernonia woodii Hoffm.,** Wild cotton, Zulu *i Nyathelo*, *u Hlonyane*, Jindwe *nyakashindo*, is a Zulu influenza remedy. Bryant states that the Zulus also use the plant for the relief of stomach-ache, an infusion of the leaf for chronic cough, and a decoction of the root for pain in the chest. They inject the infusion as an enema in feverish conditions, and use preparations of the plant as an antiparasiticide in the hair (Bryant). The Jindwes rub a powder of the burnt wood into incisions in the skin to relieve rheumatism.

In the Transvaal, natives (probably Chuanas) administer a decoction of **Vernonia kraussii Sch. Bip.,** Suto *mofefabana*, Chuana (?) *sefafatse*, for the relief of abdominal pain during the course of pregnancy, and as a stomachic bitter. The Pedis use the plant as a dysentery remedy, while the natives in the Filabusi district of Northern Rhodesia take a decoction for rheumatism.

The Sutos use **Vernonia hirsuta Sch. Bip.,** Suto *phefo-e-kxolo*, *hlelehlele*, *sethšee*, as an ingredient of a colic remedy and a root decoction for many diseases (Phillips). In the Western Transvaal, natives (probably Chuanas) use the plant as a stomachic bitter.

The Swazis use the powdered bark of **Vernonia natalensis Sch. Bip.,** Swazi *isi Baha*, as a remedy for malaria and other febrile conditions. It produces emesis. They also take the powder for cough and inject it in the form of an enema to relieve pains in the loins, and inhale the smoke from burning it for headache.

The Chewas of Nyasaland take an infusion of the leaf of a **Vernonia,** *sp. nov.* (not yet published), Chewa *mathodwa*, in the treatment of relapsing fever, dysentery, and colds. The infusion is drunk hot, and produces profuse sweating.

A **Vernonia sp.** (*not matched in the South African National Herbarium*), Fingo *uHlunguhlungu*, is used by the Fingos as a remedy for syphilis by applying a paste of the bark made with the leaf of **Sida longipes E. Mey.**

According to Bryant, the Zulus apply a paste of the leaf of **Mikania capensis DC.,** Zulu *umDlonzo*, over the bladder (the skin being previously anointed) for a " disease " of the urinary organs contracted from intercourse with the girl of another youth. They also use the paste as a local application to venereal sores. The Thongas use **Mikania scandens Willd.,** Thonga *kamele*, as a remedy for snake and scorpion bite (de Almeida).

Pteronia pallens L. fil., Witbossie, Witgatbos, Scholtzbossie, Aasvoëlbos, is toxic to stock.[1, 2, 3] A single sheep, drenched with 300 grm. of dried flowering material, died in thirty hours without symptoms. *Post mortem*, there was marked cyanosis, effusion of fluid into the serous sacs, subendothelial

haemorrhages, hyperaemia, and degenerative changes in the liver, and oedema of the periportal, retropharyngeal, and submaxillary lymph glands.[3]

A decoction of the root of **Aster asper L.**, Suto *phoa*, Zulu *uDlutshana*, *umHlungwana*, is given by the Sutos to infants with sinking-in of the fontanelles, and is used as a remedy for syphilis and caries of bone. The Zulus use the root as a snake-bite remedy (Medley Wood) and as a cough remedy (Bryant). Bryant states that the plant is toxic, and that the Zulus take it for stomach and intestinal complaints.

The Sutos crush and inhale **Aster muricatus Less.,** Suto *moroka-hlôhô*, to relieve headache, while the Zulus drink a decoction of the root of **Aster serrulatus Harv.,** Zulu *uDlutshana*, for stomach troubles and as an antidote in poisoning (unspecified). The decoction has a burning taste and is purgative.

Bryant records that the Zulus inject an infusion of the leaf of **Aster erigeroides Harv.,** Zulu *isiThelelo*, as an enema. It is given for intestinal parasites, to relieve abdominal pain, and as a strong purgative.

An infusion of **Aster filifolius Vent.** (Diplopappus filifolius DC.), Draaibossie, Gombossie, Numbossie, Suto *sehalahala*, *leholo*, *thlare-sa-dinoya*, is taken with camphor as a tape-worm remedy by the Xosas and Kwenas. Steyn [60] reports that the plant has been suspected of producing mortality in sheep. Feeding tests by him confirm this. The chief symptoms are weakness, acceleration of the pulse, tympanites, irregular respiratory rhythm, and sometimes salivation. *Post mortem*, there is found cyanosis, subendocardial haemorrhages, congestion of various organs, fluid in the serous sacs, and oedema of the lungs. Catarrhal gastro-enteritis is also observed.

Juritz [4] states that **Aster hispidus Bkr.** (Diplopappus asper Less.), Xosa (?) *uNozixekana*, *umTshekisana*, Suto *phoa*, is toxic, though there is no record of human fatality. He isolated from the root and tuber 0·19 per cent. of a very acrid resin. A decoction of the plant produces a strong emetic action, purgation, and depression. The Sutos, for the relief of colic, inject an enema of a decoction of the root made with **Helichrysum callicomum Harv.** and **Helichrysum rugulosum Less** (Phillips).

Erigeron canadense L. (Leptilon canadense (L.) Britt.) was at one time used in orthodox medicine and is an introduced weed. It is known as Horseweed, Prideweed, Butterweed, Bitterweed, Fireweed, Fleabane, Canada fleabane, Scabious, Bloodstanch, Cow's tail, Mare's tail, Colt's tail, Suto *mokotedi*, *lehanunyana*, *setsohatsana-sa-basia*, *lehamu*. The Sutos drink a decoction of the leaf for sore throat, and wash sick children with a lotion made from it (Phillips). They also treat ringworm with the plant alone and eczema with a preparation of the plant and **Andropogon sorghum Brot.,** *var.* **saccharatus Körn.** (Phillips). In the United States of America the plant causes a mild degree of hay fever, but in South Africa it is a doubtful cause.[5] In America the plant is used as a haemostatic and as a remedy for diarrhoea and dropsy.[6] The plant is said to have a faint agreeable odour, a bitter taste, and astringent properties.[6] A volatile oil, known as *oleum erigerontis*, *oleum erigeronis*, *oil of fleabane* and *oil of canada fleabane*, was at one time included in the United States Pharmacopoeia. From fresh leaf the yield is 0·2 [7] to 0·66 [8] per cent., while the dry leaf gives 0·26 per cent.[8] The oil contains *d-limonene* [7] or

a-limonene.[9] *Tannic acid* and *gallic acid* have also been isolated from the leaf.[7] The action of the herb is, therefore, due to the volatile oil and tannic acid it contains.

From **Felicia muricata Nees.,** Suto *mmamileng*, *mogantswane*, *kwelehane*, the Sutos prepare a headache remedy and a medicine for cows which become ill after calving (Phillips).

Nidorella hirta DC., Suto *mokotedi-o-mosêhla*, is used by the Sutos to fumigate a hut when a child is feverish.

Farmers think that **Nidorella resedaefolia DC.** causes staggers in horses, but at present there is no scientific support for this view.[3] **Nidorella anomala Steetz.,** Suto *lehlomane-la-loti*, has been suspected of causing stock-poisoning, but 500 grm. of fresh flowering material fed to a sheep produced no ill-effects.[3] When a Suto mother becomes pregnant again soon after the birth of a child, a decoction of the root is administered to both child and mother as a charm remedy.

The Zulus administer a strong infusion of the leaf and stem of **Nidorella mespilifolia DC.,** Zulu *umDlonzo*, for feverishness in man and as a tonic to animals.

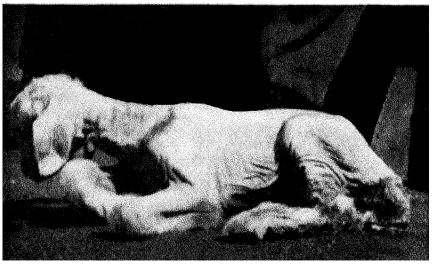
Conyza ivaefolia Less. is known as Albany gall-sick bush, Oven bush, Bakkabossie, Bakbossie, Koëlbossie, Oondbossie, Xosa *iSavu*, Zulu *u Hlabu*, *uManzinnyama*. Europeans administer an infusion in fever and chest troubles, and to hasten the birth of the placenta when delayed. The infusion is also taken by Europeans for heart diseases, and was much in evidence as a remedy during the influenza epidemic of 1918. A poultice of the leaf is often applied to inflammations, especially inflammations within the abdomen. The action here is probably a purely physical one, which could be obtained by the use of any suitable material in a like manner. Among the Zulus, a leaf infusion is taken by the mouth or as an enema for colds and coughs, and the powdered, charred root is rubbed into incisions on the side of the chest in children suffering from pleuritic pain. Smith states that the plant has been used as a remedy for gall-sickness in stock. Wicht is of the opinion that the plant has a diaphoretic action.

The Zulus use an infusion of the leaf of **Conyza podocephala DC.,** Zulu *isiTshotshokazane*, Suto *manku-a-maholo*, as a remedy for coughs and colds, and as a lotion for chafing. The Sutos administer a decoction of the root to feverish patients, and regard the plant as a valuable fumigator in cases of illness (Phillips). They use **Conyza obscura DC.,** Suto *phefo-ya-meru*, for the same purposes (Phillips). A decoction of the leaf of **Conyza incisa Ait.,** Zulu *uMachakazi*, is a Zulu cough remedy (Bryant).

The Sutos burn **Conyza pinnatilobata DC.,** Suto *sekxalana-se-seholo*, with **Amphidoxa gnaphaloides DC.** in the sickroom to drive away disease (Phillips).

The leaf of **Nolletia ciliaris Steetz.,** Suto *moloka*, is smoked by the Sutos for the relief of headache (Phillips).

An interesting condition known as *kaalsiekte*, an alopecia affecting kids and lambs, has been described by Steyn,[61] from whom the following data is quoted. The disease results in considerable loss in the Willowmore and Uniondale districts of the Cape Province. It is more prevalent in good years,



KAALSIEKTE.

Natural Case of the Disease, showing almost Complete Loss of Hair. From Steyn's Paper.

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especially when there are late winter and early summer rains, and appears in the flocks most commonly during the months of August, September, and October. The disease chiefly affects kids and lambs from four to fourteen days old, is uncommon over fourteen days, and very rare after the age of three weeks. The percentage of kids and lambs affected may be as high as 100, but outbreaks are known where the incidence has been very low. The mortality, with bad nursing, is as high as 90 per cent., but care in the handling of the sick animals reduces the death-rate to about 50 per cent.

The earliest symptom is itching, which results in scratching and biting of the sides. The hair over these parts often presents a ruffled appearance and can easily be pulled out by the hand. Shedding of the coat begins, at the earliest, three days from the onset of symptoms, and may occur any time up to fourteen days. It is rare after that period. The animal may become completely bald within a few *hours* from the commencement of the shedding, but sometimes the process may take several days to complete. The rate of shedding of the coat depends on the severity of the attack. The first bare patches of skin are invariably seen over the shoulder-blades and upper half of the hind legs. Pigmented hair is more resistant to shedding than non-pigmented.

Diarrhoea almost invariably accompanies the alopecia, and may be extremely severe. Affected animals sometimes die within the first three days after birth before the onset of the alopecia. As soon as diarrhoea sets in, the patient becomes listless and feverish, and shows marked anorexia. Ultimately these symptoms become so severe that the animal has a staggering gait, and finally is unable to rise. Most of the cases develop in addition acute conjunctivitis, rhinitis, and keratitis.

Should the animal survive the acuter stages of the diarrhoea, it is then subjected to certain secondary risks. Exposure of the bald skin to the sun results in an acute dermatitis, and similar exposure to cold may cause an acute pneumonia which often proves fatal. The primary diarrhoea persists and is aggravated by swallowing of the hair. The amount of hair swallowed may be sufficient to cause an acute obstruction in the gastro-intestinal tract, and such acute obstruction has been known to develop as late as three months from the onset of the disease.

Post-mortem examination reveals an acute catarrhal gastro-enteritis, especially when diarrhoea has been present. If shedding of the coat has taken place, hair is always found in the alimentary tract, and may be formed into balls. The lungs are sometimes found to be in a pneumonic condition.

Many of the animals recover if they are carefully nursed. It is particularly important to protect the bald subject from the direct rays of the sun and from cold. The effects of the swallowed hair in aggravating the diarrhoea and in producing obstruction in the gastro-intestinal tract may be considerably lessened by the early administration of mild oily purgatives. The diarrhoea has been successfully treated by the administration of one-gram doses of tannic acid in a mixture of raw linseed oil and lime water in equal parts.

Investigation by Steyn shows that kaalsiekte in kids and lambs results from the mothers eating **Chrysocoma tenuifolia Berg.**, Bitterkarroo, Beeskaroo,

Beesbossie, Brandbossie, Bitterbossie, Suto *sehalahala*. The toxic principle is ingested by the young in the milk, but it is interesting to note that the mother may frequently show no symptoms of poisoning. It has been found that if the pregnant does and ewes are prevented from eating the plant for not less than two weeks before and two weeks after parturition, that the disease does not usually develop in the young. Once the kids and lambs are weaned, no further cases of the disease occur in the flock. It is noteworthy that animals are not born with the disease.

Steyn has shown that feeding 4 lbs. of the fresh plant daily results in poisoning of adult sheep and goats. They eat it freely despite its bitterness. Within a few days of commencing the feeding, the subjects develop an acute diarrhoea, accompanied by great straining and the presence of a considerable amount of mucus, and sometimes blood, in the dejecta. The animals lose rapidly in condition and suffer from great thirst. They have a mucous discharge from the nostrils and sometimes abort. Death is by exhaustion. *Post-mortem* examination reveals an acute gastro-enteritis. The feeding of other food-stuffs with the plant greatly lessens the likelihood of poisoning of the mother, but the young develop alopecia none the less. Chrysocoma tenuifolia collected at Colesburg is more toxic than that from Willowmore. Drying does not destroy the toxicity of the plant.

Brachylaena elliptica Less., Firesticks, Bitterblaar, Suurbos. Zulu *uHlunguhlungu*, *iPhahle*, Xosa *isiDuli*, is used medicinally by the Zulus and the Xosas. The former take an infusion of the decorticated root as an emetic for pains in the side, and whenever the breathing is not normal (pneumonia) (?), and inject as an enema an infusion of the leaf for biliousness and backache. The latter use a decoction of the leaf as a gargle for sore throat, ulcerations about the mouth and throat, and in quinsy and thrush (Smith, Hewat). The leaf has a considerable reputation among Europeans and Natives as a remedy for diabetes, and one constantly hears of cases where it is stated to produce benefit. This is not supported by controlled observations. Gunn and Morrison [10] investigated the effects of subcutaneous and intravenous injections of an infusion upon the blood-sugar level of a large number of normal rabbits. In most of them there was no change, in a few the blood-sugar fell, but the extent of the fall was almost within the experimental error of the method used. A few showed a rise in the blood-sugar reading. They conclude, rightly, that the infusion produces no effect upon carbohydrate metabolism, but that in some cases there is a slight fall in the blood-sugar percentage, which fall occurs haphazard and is in no way related to dosage. Falconer [11] tried the infusion on six cases of glycosuria : four showed no improvement either in the glycosuria or in the blood-sugar percentage ; in the other two, the glycosuria disappeared temporarily, but in neither case could it be shown to be due to the action of the plant. The decrease in glycosuria was accompanied by a rise in the blood-sugar level. There occurred, therefore, in these two cases, a rise in the renal threshold to sugar which Falconer thought was independent of the bitter blaar. Gunn and Morrison [10] state that the infusion is *bitter*, contains one or more *glucosides*, and probably no resin, and is negative to tests for alkaloids. It produces a considerable amount of local reaction when given subcutaneously.

Bennison [12] finds that the leaf contains *mucilage*, *tannin*, and a *bitter principle*, which he thinks may be alkaloidal. Alcoholic extracts are more bitter than watery preparations. There seems little doubt that Bitterblaar is useless in diabetes, except in so far as it may improve appetite and digestion from its bitter action. Benefit from its local use as a gargle, etc., arises from the demulcent and astringent effects of the mucilage and tannin respectively. The leaf is on the market as a commercial product.

An infusion of the leaf of **Brachylaena discolor DC.,** Bitterblaar, Bosvaalbos, Zulu *iPhahla*, is used in diabetes and renal conditions by both Europeans and Natives. It is said to act as a tonic. The early Dutch settlers made alkali for soap-making from the ashes of the plant.[13] According to Bryant. the leaf is an ingredient in a Zulu remedy for intestinal parasites.

It has been suggested that **Brachylaena racemosa Less.** may be used in the same way as Brachylaena elliptica Less.,[14] but we have no evidence of this.

All parts of **Tarchonanthus camphoratus L.,** Wild cotton, Sage wood, Wilde-salie, Kamferhout, Kamferbos, Sieriehout, Vaalbos, Veld-vaalbos, Vaaibos, Suto *mofahlana*, Rolong and Thlaping *mohathla*, have a camphoraceous odour (Pappe). Pappe states that the dried leaves were smoked by the Hottentots and Bushmen like tobacco and that slight narcosis results therefrom. Nowadays the Sutos inhale the smoke from burning green branches for the relief of headache (Phillips), and the Rolongs do the same with the smoke from burning the green root. The latter smoke rheumatic joints with smouldering green twigs, and drink an infusion of the green leaf for stomach troubles. Pappe records that an infusion of the leaf is diaphoretic, and was used by the early Cape settlers in spasmodic asthma, while Wicht states that the plant is used as a toothache remedy. It is stated that the leaf contains *camphor*.[15] but we have found no scientific confirmation of this. The leaf does not appear to be toxic, as drenching tests with stock proved negative.[16] The plant yields, by steam distillation, 0·107 per cent. of *volatile oil*.[17]

Epaltes elata Steetz. has been suspected of being toxic to stock, but drenching tests on a single sheep produced no effect.[3]

The Sutos burn **Amphidoxa gnaphaloides DC.,** Suto *mosuoane-oa-naha*, *toanenyane*, with **Conyza pinnatilobata DC.,** in the sickroom to drive away sickness (Phillips). They do likewise with **Gnaphalium undulatum L.,** Suto *mothepetelle*, *phefo*, and **Gnaphalium luteo-album L.,** an introduced species known as Cudweed, Roerkruid, Suto *musuwane*, *manku*, and **Gnaphalium sp.,** Suto *mosuwane-wa-mosimo*, in the hut of a feverish child. **Gnaphalium luteo-album L.** has apparently been suspected of causing poisoning of stock, but, given by the mouth to rabbits it produces no ill-effects.[3]

The leaf of **Helichrysum leiopodium DC.,** Zulu *isiDwaba-somkhovu*, Pondo *iColacola*, Suto *phefšwana-basia*, *letapiso*, *mohlemêla-tsie-wa-thota*, *mohlemêla-tsie-wa-thaba*, Chuana and Kwena *phefo*, *mothabelo*, is used as a tea by the Zulus and the Pondos. The former drink a decoction of the root for chest troubles and also as an emetic in similar conditions. The Sutos make a steam bath by pouring an infusion on hot stones, which is applied to patients suffering from fever or bad dreams. They use the plant as a poultice for swellings. According to Phillips, they also administer a decoction as an enema to children

suffering from colic. The Chuanas and Kwenas drink a decoction of the root for "internal sores" (intestinal ulceration) (?), and rub an ointment of the charred plant into scarifications over bruises.

Zulu women use **Helichrysum stenopterum DC.,** Zulu *imPepho,* in making a lotion for washing themselves when they have disagreeable body odours. They also use the flower in hairdressing and for ornament.

The leaf of **Helichrysum pedunculare DC.,** Xosa *isiQutsi, isiCwe,* is applied by the Xosas and Fingos as a dressing after circumcision, the idea being that it prevents the development of serious inflammation. Europeans state that it makes an excellent dressing for festering sores, as also does the leaf of **Helichrysum foetidum Cass.,** Muishondblaar.

An infusion of **Helichrysum crispum Less.,** Hottentot's bedding, Hottentots-kooigoed, Hotnots-kooigoed, Kooigoed, is used by Europeans as a remedy for "heart weakness" in man and animal. It is said to quieten the heart's action.

Helichrysum imbricatum Less., Duinetee, has been used as a tea, and an infusion as a demulcent in coughs and other respiratory affections (Pappe). **Helichrysum nudifolium Less.,** Kaffir tea, Kaffertee, Xosa *iColocolo,* according to Pappe, is demulcent, and was used as an infusion in respiratory conditions. The Xosas use it as a remedy for colds (Smith).

Helichrysum serpyllifolium Less., Hottentot's tea, Hotnots-tee, Vaaltee, is used by the Hottentots and coloured folk as a tea. Pappe states it is demulcent, and was used, like the preceding, in chest affections. Juritz [18] records that two persons are said to have died after drinking this tea, but it appears doubtful whether the plant is toxic, as the organs of the deceased, when analysed, were found to be free from toxic principles. In this connection, 10 per cent. of an acrid resin was isolated from the root of a Helichrysum sp., which was thought to be identical with the preceding. The resin produced vomiting and purgation when given to a dog by the mouth.[18] Pappe mentions that **Helichrysum auriculatum Less.,** Hottentot's bedding, Kooigoed, was used in the same way as Helichrysum serpyllifolium.

The leaf of **Helichrysum appendiculatum Less.,** Sheep's ears, Xosa *inDlebe-yemvu,* Suto *senkotwana,* is a Xosa remedy for chest troubles (Smith, Hewat), and **Helichrysum capillaceum Less.,** Suto *mosuwane-oa-lehabo,* a similar Suto remedy for children (Phillips).

A decoction of **Helichrysum caespititum Sond.,** Suto *seledu-sa-phooko, moriri-wa-naha, moriri-wa-setsohadi,* Kwena and Kxatla *sephanyane,* is drunk by the Kwenas and Kxatlas in the treatment of gonorrhoea. The Sutos, in addition to inhaling the smoke from burning the plant for the relief of head and chest colds, take a decoction of the root as a remedy for nausea (Phillips).

The Sutos administer a decoction of the root of **Helichrysum adenocarpum DC.,** Suto *towane-badingwana,* to children suffering from diarrhoea and vomiting, and rub the powdered ash of **Helichrysum sutherlandi Harv.,** Suto *molepelle, senkotwana,* into scarifications on the bodies of the sick (Phillips). **Helichrysum setosum Harv.,** Suto *phefo-ya-thaba, bohloko,* is used by the Sutos to fumigate huts, and a decoction of **Helichrysum fulgidum Willd.,** Suto *leabane,* as a lotion for sore eyes (Phillips). They also use a decoction of the root of **Helichrysum psilolepsis Harv.,** Suto *towane-kxomo,* as a remedy for painful menstruation, and

Helichrysum latifolium Less., *var.* **reticulatum,** Suto *papetlwane-e-kxolo, leboko,* as an ingredient of a colic remedy (Phillips).

A decoction of **Helichrysum mundii Harv.,** Suto *phefo-ya-didiba,* is taken by the Sutos for chest troubles, while Suto men drink a decoction of the root of **Helichrysum platypterum DC.,** Suto *papetlwane-ya-mafika, lesira, lešetla,* to renew their virility (Phillips). The Sutos use **Helichrysum gymnocomum DC.,** *phefo-ya-setlolo,* to fumigate huts, and their women make a pleasantly perfumed ointment from the plant (Phillips). **Helichrysum aureo-nitens, Sch. Bip.,** Suto *towane-podi, towane-ntja,* is a Suto remedy for bed-wetting in children (Phillips).

The Sutos smoke the leaf of **Helichrysum dregeanum Sond. and Harv.,** Suto *towane-ya-thaba,* for cold in the head, and the leaf of **Helichrysum athrixiifolium O. Hoffm.,** Suto *motoantoanyane-o-monyenyane,* for chest complaints (Phillips). They administer a decoction of the root of **Helichrysum calocephalum Schltr.,** Suto *towane-balingoana-e-kholo,* to children suffering from diarrhoea (Phillips). **Helichrysum rugulosum Less.,** Suto *motwantwanyane-o-monyenyane,* is used by the Sutos to fumigate the hut in cases where children have colds, and as an ingredient in an enema for colic (Phillips). **Helichrysum callicomum Harv.,** Suto *motwantwanyane,* is used in a similar enema by the Sutos (Phillips).

We are informed that natives commonly use **Helichrysum lepidissimum S. Moore** as a body perfume, in the form either of a powder or of an ointment. **Helichrysum sp.,** *prob.* **H. kraussii Sch. Bip.,** has evidently been suspected of producing poisoning in stock, but a drenching test in a single sheep gave negative results.[3]

Europeans in the Wellington district use an infusion of **Helichrysum sp.,** Bytbos, for colds, body pains, and other conditions. Natives in the Bikita district of Southern Rhodesia drink the ash of **Helichrysum sp.,** Bikita natives *bomanoka,* mixed with beer as a cure for epilepsy.

According to Pappe, **Leontonyx angustifolius DC.,** Beetbossie, has an aromatic smell, and was used by the early settlers as an ointment for ulcers.

Thunberg records that, in the early days of the Colony at the Cape, the settlers used a decoction of **Stoebe sp.** (Seriphium sp.), Stangebos, as an anthelmintic, and that a **Stoebe sp.** smells like valerian and may be of some effect in epilepsy.

In the time of Pappe, a wine or brandy infusion of the tops of the branches of **Elytropappus rhinocerotis Less.,** Rhenoster bush, Renosterbos, Renostertoppe, was taken as a stomachic bitter in dyspepsia and other conditions related to impaired digestion. The powdered tops were also given to children with diarrhoea. Pappe stated that the whole plant is bitter and resinous. Nowadays Europeans take either an infusion or a tincture for similar purposes. The preparations are said to stimulate sweating. The plant had a great vogue as a remedy during the 1918 influenza epidemic. It was also formerly used as a remedy for krimpsiekte in sheep.[19] The air-dried tips of the branches yield up to 10 per cent. of a *wax-like material* to organic solvents.[20] Pappe quotes Thunberg as recording that a decoction of **Elytropappus glandulosus Less.,** Slangenbos, Slangbos, is a good anthelmintic.

The Sutos use **Metalasia muricata Less.,** Blombos, Suto *lehlôhlô, sehalahala-se-seputswa,* along with **Eriocephalus punctulatus DC.,** to fumigate the hut of a person suffering from a cold or diarrhoea, and a hut during illness or after a death (Phillips).

Pappe mentions that **Leyssera gnaphaloides L.,** Geelblommetjies-tee, Hongertee, Hongerbos, Skilpadtee, has an agreeable odour, and that an infusion has a pleasant, sweetish taste. He states that it is emollient, and therefore was much used in catarrh, coughs, and pulmonary tuberculosis. Europeans and Natives, nowadays, take an infusion of the leaf and flower as a tonic in loss of appetite. Marloth [21] says that the plant is used as a "tea" in the Cedarberg, and that the infusion has a pleasant, aromatic flavour, with stimulating action.

The Zulus use a decoction of the root of **Athrixia phylicoides DC.,** Kaffir tea (Natal), Zulu *umTshanela, iTshelo,* Suto *sephomolo,* Gcaleka *iGqogqina,* as a cough remedy and a purgative. Both the Zulus and the Gcalekas use an infusion of the herb as a "tea," while the Zulus and Europeans take the infusion as a "blood purifier" for sores, boils, etc. As a cure for sore feet, the Sutos bathe the feet, after scarifying them, with a decoction of the leaf and root of **Athrixia elata, Sond.,** Bostee, Suto *phefšwana-ya-basia,* Chuana *towane* (Phillips). The Chuanas give a decoction of the herb as a stimulant to convalescents. **Athrixia angustissima DC.,** Suto *phefšwana-e-nyenyane,* is used by the Sutos in the same way as the preceding (Phillips). The Xosas administer a decoction of the root of **Athrixia heterophylla Less.,** Xosa *iYeza-logezo,* made with **Anemone caffra E. and Z.,** in the treatment of madness (Smith). In addition, the dried root of the Athrixia is used as a snuff as part of the treatment.

The Sutos inject an enema made from **Printzia pyrifolia Less.,** Suto *sephomolo, lekhisa,* in the treatment of internal tumours (Phillips).

Inula graveolens Desf., Khaki bush, Khaki weed, Stinkweed (Australia), is an introduced species which does not appear to be used in South Africa. In Europe it is a remedy for colic, dysuria, and amenorrhoea, and in Australia for asthma. Schimmel & Co. [22] have isolated a brown *volatile oil* with a greenish fluorescence. They think it probably contains *bornyl acetate.* According to Merck,[23] preparations of the plant are capable of paralysing both the respiration and the motor activities of animals. They express the view that the plant apparently contains two principles which act upon the central nervous system. On account of suspected toxicity to stock, a single observation has been made of the oral administration of the plant to a rabbit.[3] The results are inconclusive, as the animal died after six days from pneumonia and pleuritis.

The Zulus apply a paste of the powdered leaf of **Pulicaria capensis DC.,** Zulu *um Khathula,* to the vagina for the treatment of tumours, and they take the powdered leaf of **Pulicaria scabra Drme.,** Zulu *isiShoshokazana,* as a tonic and for colds.

Vermeersiekte or *Misbeksiekte* is a disease of stock resulting from the ingestion of various species of **Geigeria.** In the Cape Province, particularly the north-western parts, **Geigeria passerinoides Harv.,** Vermeerbossie, Suto *hlohwana-kxolwanyane,* is the cause; [24, 25, 26] in Griqualand West, **Geigeria**

FIG. 1.

FIG. 2.

GEIGERIA POISONING IN SHEEP.

FIG. 1.—In the Act of Vomiting.

FIG. 2.—Head of Sheep suffering from *Vermeersiekte* (Geigeria Poisoning), showing Vomited Material adhering to the Mouth and Nose.

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pectidea Harv.; and in the Western Orange Free State and South-Eastern Transvaal, **Geigeria aspera Harv.**[26] **Geigeria zeyheri Harv.**, which is widespread in the Transvaal, has not yet been reported as producing the disease under field conditions, but produces it experimentally.[26] **Geigeria passerinoides** had early come under suspicion as the cause of the disease in the Cape Province, but all attempts at producing it experimentally by feeding the plant to animals proved fruitless.[27] These tests were undertaken on account of the fact that the plant was abundant on farms where the disease occurred, and, indeed, might be the only plant green at the time. Elley,[27] despite these negative experiments, persisted in thinking that the plant was the causative agent. Sheep and, to a less extent, goats are most susceptible, and it is estimated that enormous losses have taken place from time to time. Steyn [26] reports that in a small area of Griqualand West, 1,500 sheep were lost over a period of three months. Cattle, though apparently less liable to become affected, are often lost in large numbers, as, for example, during 1930 in Griqualand West.[26] Horses and donkeys sometimes suffer from the intoxication.[26] **Geigeria zeyheri** and **Geigeria pectidea** are *two* to *three times*, and **Geigeria aspera** *ten times* as *toxic* as **Geigeria passerinoides.**[26] The toxicity, however, of any species may vary from time to time.

Formerly [24] the symptoms of Vermeersiekte were described as vomiting, cough, weakness, and loss of condition, with death from exhaustion. Now, four types of the intoxication are distinguished.[26] As the name indicates, the commonest type, particularly in sheep, is characterised by vomiting. The earliest symptom is salivation, which is followed by the development of persistent vomiting and diarrhoea. There is often some degree of hoven and a stiff gait, the latter affecting the hind limbs more noticeably. The respiration is usually quickened and the heart unaffected to begin with, though it becomes steadily weaker as the condition progresses. Sheep sometimes die suddenly without symptoms after the ingestion of large quantities of either Geigeria aspera or Geigeria pectidea, but this has not been recorded as occurring with Geigeria passerinoides or Geigeria zeyheri.

A second group of cases exhibits hoven as the main feature, while the third is the stiff form, characterised by a stiff gait. The latter is probably an early stage of the fourth type or paralytic form. Combinations of all types are frequently seen. Goats are more susceptible to the paralytic form associated frequently with hoven and a stiff gait. Cattle almost invariably develop the paralytic form associated with a slow stiff gait and hoven. Dogs and pigs cannot be killed by the plant, apparently from the very rapid development of vomiting after its ingestion.

Death occurs in a variety of ways: (*a*) from asphyxia as a result of the aspiration of vomit into the bronchi and lungs, the amount being insufficient to produce instantaneous suffocation; (*b*) from paralysis of the respiratory centre; (*c*) from exhaustion as a result of the incessant vomiting and diarrhoea; (*d*) from heart failure; and (*e*) from chronic pneumonia developing weeks, even months, after the aspiration of vomit in small amounts.[26] *Post mortem*, all species of animal almost invariably show lips moistened with saliva and stained with green vomit and an acute gastro-enteritis. One may find, in

addition, one or more of the following : hyperaemia and slight oedema of the lungs ; ruminal contents in the trachea and bronchi ; acute or chronic broncho-pneumonia ; hyperaemia of, and haemorrhages into, the bronchial, mediastinal, and retropharyngeal lymph glands ; degenerative changes in the heart muscle and in the liver ; and oedema of the periportal lymph glands.[26]

The active principle or principles have not yet been isolated from the plants. Steyn [26] is of the opinion that they act by irritating the mucosa of the rumen and by direct stimulation of the vomiting centre.

Geigeria passerinoides Harv. has considerable value as a stock food, provided the animal is not poisoned by it.[26] The Sutos rub a preparation of the plant into incisions on the forehead, cheeks, and neck of children supposed to be suffering from parasites inside the head (Phillips).

Geigeria aspera Harv., Geigeria pectidea Harv., and **Geigeria zeyheri Harv.** are too toxic to be of any value as food-stuffs for stock.

The Kwenas and Kxatlas rub burnt and powdered **Geigeria sp.,** Kwena and Kxatla *mothlabelo*, into incisions over the sternum to relieve acute pains.

According to Bryant, **Callilepis laureola DC.,** Zulu *imPila*, is poisonous. The Zulus take a decoction of the root as a vermifuge and an infusion as a purgative. They also use an infusion of the leaf as a purgative enema. Wood mentions that the Zulus apply a paste of the root to kill maggots in cattle. Maberley [28] records that the root, gathered in winter, is a native cough remedy, and that he has found it useful in the treatment of whooping-cough. He states that the active principle is a resin.

A decoction of **Osmitopsis asteriscoides Cass.** (Osmites asteriscoides Linn.), Mountain daisy, Daisy, Bellis, Bells, Belse, Bels, is taken by Europeans to relieve body aches and pains. It produces sweating. Europeans use it extensively with **Artemisia afra** and **Eucalyptus globulus** in the treatment of influenza. They also drink a tincture or an infusion for rheumatism, and apply a poultice of the leaves to cuts and swellings. According to both Thunberg and Pappe, the plant contains much *volatile oil*, with a camphoraceous odour and taste. In the early days, external applications of the plant were made to relieve inflammations and colic, and *spiritus bellidis* was much esteemed in coughs and hoarseness. Thunberg mentions that he found this spirit useful as an embrocation in paralyses. V. Gorup-Bezanez [29] isolated a yellowish-green *volatile oil* which resembles *oil of cajeput* and contains *camphor*. Pappe records that **Osmites hirsuta Less.,** Van der Merwe's kruie, has a similar smell.

Xanthium strumarium L., Cocklebur, Clotbur, Noogoobur, Spitzklette, Boetebossie, and **Xanthium spinosum L.,** Burweed, Cocklebur, Clotbur, Boetebossie, Boeteklis, Pinotiebossie, Suto *mokwala*, *sehlabahlabane*, Kxatla *boxopa*, are introduced species. In Australia the young plants are said to be poisonous,[16] but Arthur, of Illinois, states that, though decoctions may be toxic, the plants are not poisonous under field conditions.[16] According to the United States Dispensatory,[6] Guichard has isolated an *alkaloid* from **Xanthium spinosum,** and Zander a glucoside, *xanthostrumarin*, from **Xanthium strumarium.** Both plants are said to be effective local and general styptics.[6] The leaf of Xanthium strumarium occurs as an adulteration of stramonium

leaves [6] (Tschirch), and branches of Xanthium spinosum are rubbed by the Kxatlas over the bodies of bulls as a stimulant (Schapera).

The Zulus use an infusion of the leaf and stem of **Wedelia natalensis Sond.,** Zulu *umPhamipuce*, *ubuHlungwana*, as an emetic, and as an enema in diseases of the chest and abdomen. Bryant records that they also use an infusion of the root as an enema in dysenteries and diarrhoeas. Similar infusions are administered as an emetic or as an enema in fevers. The leaf and its juice is a Zulu dressing for wounds.

An infusion of the root of **Melanthera brownii Sch. Bip.,** Zulu *i Khaphanyongo*, *iShiyapice*, is used by the Zulus as an emetic and an infusion of the leaf and stem as an emetic for children.

The Zulus apply the moistened powdered leaf of **Spilanthus acmella L.,** Zulu *isiSilili*, to hollow teeth to relieve toothache, and rub it on the lips and gums of children suffering from "sore mouth." The application is said to be soothing, and to stimulate the flow of saliva. In East Africa the plant is used as a snake-bite remedy (Santesson). Asano and Kanematsu [30] have isolated *spilanthol*, $C_{14}H_{25}NO$, from the flower. It boils at 165° under 1 mm. Hg. pressure, has a hay-like odour and a strong local anaesthetic action. Should the leaf prove to contain the same product, there would be a definite basis for its use in relieving toothache.

The Zulus chew the young shoots of **Bidens pilosa L.,** an introduced weed, for the treatment of rheumatism. The plant is known as Black jack, Beggarticks, Duiwelskerwel, Wewenaar, Zulu *uQadolo*, Suto *moonyane*. The Zulus also administer the powdered leaf in water as an enema for abdominal troubles, and rub the burnt seeds into incisions on the sides for the relief of pain. The flower is a Zulu diarrhoea remedy, and, according to Bryant, they take an infusion of the leaf and root for colic.

Tagetes minuta L., an introduced weed, known as Khaki bush, Mexican marigold, and Kakiebos, is frequently referred to in the daily Press as an excellent parasiticide for cattle, but no confirmatory controlled experiments have been performed. Cases are occasionally recorded where native children have been laid to sleep among the bush and have died. Unfortunately no proper investigation of these cases appears to have been made, and one doubts very much whether the plant is the cause of death. A large dose of the plant in flower has been administered to a sheep without untoward effect.[3] A *volatile oil* has been isolated from the herb to the extent of 0·5 per cent. From this the Imperial Institute [31] has distilled 55 per cent. of a pale yellow oil, which readily deposits amounts of resinous bodies. The characteristic odour is mainly due to the presence of *carvone*, *linaloöl*, and *terpene* (either *myrcene* or *ocimene*). *Linalyl acetate* is probably present, together with small amounts of pungent-smelling *phenols*.

Eriocephalus punctulatus DC., Suto *sehalahala-sa-matlaka*, is used by the Sutos with **Metalasia muricata** to fumigate the hut of a person suffering from a cold or from diarrhoea, and to fumigate a hut during illness or after a death (Phillips).

The Namas use a decoction of **Eriocephalus umbellatus DC.,** Wild rosemary, Kapokbossie, as a colic remedy (Laidler). Pappe states that Thunberg records

its use among the early Cape settlers and the Hottentots as a diuretic in cases of dropsy. Du Plessis [32] has isolated from the fresh leaf 0·2 per cent. of a light yellow *volatile oil* with a sharp, though not unpleasant, aromatic odour and a burning taste. The flower and the seed yield the same oil. The Nama use for the plant is thus quite logical, and it is possible that the plant produces some degree of diuresis.

Natives in Middelburg, Cape Province, use an infusion of **Lasiospermum radiatum Trev.,** Xosa *isiFikane*, *sehadikane-se-seholo*, for chest affections. Smith and Phillips state that the plant is pleasantly scented, and the latter that the Sutos make an ointment from it. The Sutos also use it to fumigate the sickroom (Phillips). According to Walsh, the plant is suspected of poisoning stock.

Europeans use a decoction of an introduced **Anthemis sp.,** Kameelblom, for chill during the menstrual period, and especially when the menstrual flow is delayed.

The Xosas and Fingos use **Matricaria nigellaefolia DC.,** Staggers weed, Xosa *umHlonyane-womlambo*, *umSolo-womlambo*, Xosa and Fingo *umSolo*, as an anthrax and skin remedy (Smith). The Fingos, nowadays, treat a skin affection by inhaling the vapour from boiling the leaf in water and applying a paste of the leaf to the skin. Phillips [2] and Pole-Evans [33] state that it is the cause of " bovine staggers." Andrews [34] calls the disease " pushing disease " or " staggers," and says that it has been known popularly as " brain disease " or " brain staggers." The disease affects only bovines, and the symptoms are protrusion of the eyeballs, restless wandering with the head carried low, isolation from his fellows, a clumsy, uncertain, stumbling gait, and some difficulty in drinking. Later, the animal pushes its head against walls, trees, fencing poles, etc., at intervals. It is this symptom from which the disease is named. Involuntary twitchings and spasms of the muscles now occur, and there is inco-ordination of muscular action. Salivation and lachrymation are also seen, and constipation is a regular feature. As the intoxication develops, the animal becomes weaker and weaker, and finally sinks in coma, which in the early stages is interrupted by convulsions. Animals showing only the early symptoms have been known to recover, but once the condition is well established, death seems always to supervene. The plant has a bitter taste and a strong, characteristic, pleasantly aromatic odour. Smith expresses the opinion that the active principles are a bitter substance and a *volatile oil.* Andrews [34] confirms the presence of volatile oil in the leaf. He has also produced the disease experimentally by feeding both **Matricaria nigellaefolia** and its variety, **tenuior,** and finds that the toxin is apparently cumulative.

Europeans administer an infusion of **Matricaria globifera Fenzl.,** Stinkkruie, Miskruie, for convulsions (Wicht), and the Hottentots take an infusion of the flower and leaf in typhoid and other fevers (Smith).

Pappe states that **Matricaria glabrata DC.,** Wild chamomile, contains " a superfluity of *volatile oil,*" and is therefore an excellent antispasmodic, especially in colic. He states, also, that it is to be recommended for dyspepsia and other gastric derangements on account of its aromatic bitter taste, and is excellent as an external application to inflammations. He compares it in

efficiency to **Anthemis nobilis L.** and **Matricaria chamomilla,** both of which have been popular overseas.

Matricaria multiflora Fenzl. (Tanacetum multiflorum Thunb.), Wormkruie, contains much *resin* and a *volatile oil* with a strong peculiar odour (Pappe). It has a bitter, acrid, and aromatic taste. Pappe states that it was used by the early settlers as a tonic, antispasmodic, and anthelmintic. It was thus used in flatulency, gout, amenorrhoea, and particularly for its anthelmintic properties. It was administered either as a powder or as an infusion, the latter being both diaphoretic and diuretic. Pappe states that a fomentation of the plant quickly resolved inflammations.

A decoction of **Cotula anthemioides L.,** Xosa *umHlonyane*, Suto *hlapi-e-nyenyane,* is a Xosa remedy for head and chest colds, and was much used during the influenza epidemic. The nostrils are sometimes filled with the crushed leaf for colds. The Sutos use a decoction of the leaf and root as a colic remedy (Phillips).

The Hottentots, according to Pappe, use **Cotula multifida DC.,** Hottentot *kamso*, in treating rheumatism, scalds, and skin diseases.

A decoction of the root of **Cenia hispida Bth. and Hk.,** Suto *motwantwanyane-wa-thaba, mokubetso*, is drunk by the Sutos for the relief of nausea (Phillips).

The leaf of **Schistostephium crataegifolium Fenzl.,** Suto *leapi, lehakanya, kobokxolo, kobo-tsa-marêna*, is smoked by the Sutos for chest complaints (Phillips). The plant has been suspected of being toxic to stock, but Steyn [3] finds that 200 grm. produces no effects in a sheep.

Artemisia afra Jacq., Wormwood, Wilde-als, Als, Xosa, Zulu, and Swazi *um Hlonyane*, Suto, Pedi, and Chuana *lengana*, is one of the most widely used of popular medicines in South Africa, among both Europeans and among Natives. The usual preparation is an infusion or a decoction, often made syrupy by the addition of sugar, especially when the medicine is for bronchial troubles. It is used for coughs and colds, chills, dyspepsia, loss of appetite, and other gastric derangements, colic, croup, whooping-cough, gout, and as a purgative. The infusion or decoction is also used as a lotion to bathe haemorrhoids, as a hot bath to bring out the rash in measles, and in the ear for earache. It is held in the mouth to ease the pain of gumboils and to hasten their bursting, and is taken in fevers and in " blood-poisoning." The vapour from boiling leaves is inhaled for respiratory affections, and the genitalia are steamed with the vapour for menstrual chill and after childbirth. The fresh tips of the plant are inserted into the nose for colds and headache, and into hollow teeth to relieve toothache. A poultice of the leaf is applied locally to relieve neuralgia, to the swellings in mumps, and to the abdomen in infantile colic. In the last case, the leaf is usually moistened with brandy. A brandy tincture is taken by the mouth for colic. The vapour from a hot infusion is used to steam the throat in scarlet fever and the infusion used as a gargle. The leaf is smoked to relieve throat irritation, and is placed in the socks for sweating of the feet. Europeans often add brandy, sugar, ginger, thyme, rosemary, mint, chamomile, **Osmitopsis asteriscoides Cass.** or **Eucalyptus globulus Labil.,** to preparations of the plant. Pappe mentions that a tincture was formerly used as an efficient vermifuge, but this use seems to have gone out of fashion.

The Pedis administer a decoction to children for the relief of cough, and the Zulus use the infusion as an emetic. Phillips says that the Sutos take the decoction as an enema for constipation, and make a lotion from the plant for washing the body.

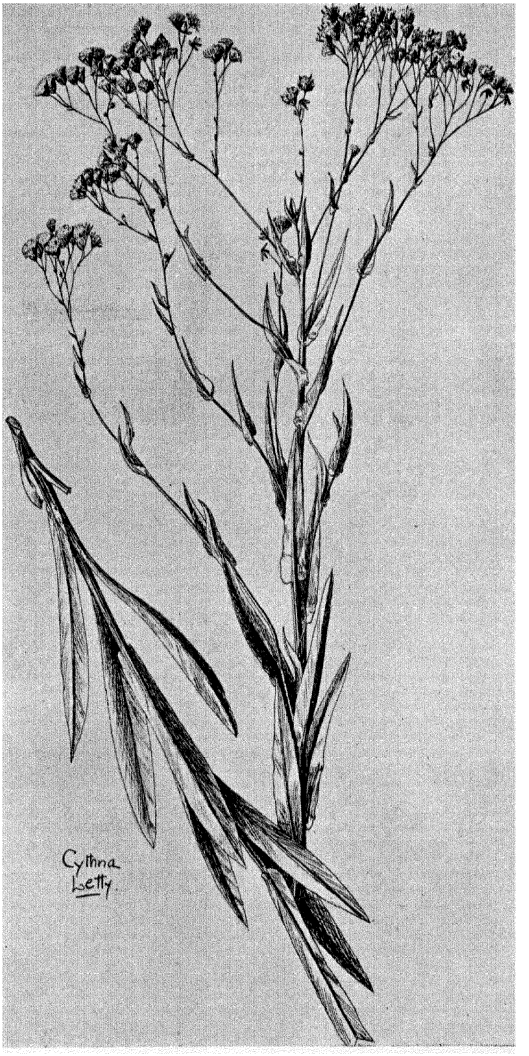
The infusion and the decoction of Artemisia afra are said to be diaphoretic and bitter. Goodson [35] has found that, unlike many other Artemisiae, the plant contains *no santonin*, nor anything which can be regarded as being related to it. He has isolated 0·5 per cent. of a *volatile oil* with a camphoraceous odour. The crude oil yields about 13·5 per cent. of dextrorotatory *camphor*. He has isolated also a wax ester (probably ceryl cerotate), triacontane, scopoletin, and quebrachitol. Any action, therefore, which the plant has as a medicine is due to the volatile oil and the camphor, the effects being pungent, bitter, very mildly antiseptic, carminative, irritant, and possibly anthelmintic, especially for hook-worm.

The Xosas take an infusion of the leaf of **Pentzia globosa O. Kuntze,** Bitter karoobossie, for stomach troubles. **Pentzia globifera Hutch.,** Stinkkruie, is suspected of causing *enzootic icterus* in sheep, but 300 grm. produces no effects in an animal of this species.[3]

The leaf of **Cineraria aspera Thunb.,** Suto *mohodu-wa-pela*, is smoked by the Sutos for asthma and tuberculosis. It is said to be as intoxicating as Cannabis indica (Phillips). The Sutos also inhale the smoke from burning **Cineraria lyrata DC.,** Suto *khotoliea*, for colds, and drink a decoction of the root to relieve colic. The ash of the plant is rubbed into incisions on the feet to relieve soreness (Phillips).

The genus **Senecio** is of considerable toxicological importance in South Africa. Various species have from time to time been regarded as causing disease in man and animal. Thus *Molteno cattle sickness* or *straining disease in cattle* and *dunsiekte*, *stomach staggers*, *grass staggers*, *ragwort poisoning*, *senecio cirrhosis disease* or *Molteno disease in horses* have been ascribed to the eating of senecios. Likewise, fatal cases of senecio poisoning in man have been reported from the Riversdale district of the Cape. The relationship of these diseases to Senecio will be discussed in a later paragraph.

According to Chase,[40, 41] affected cattle become "unthrifty," but do not show serious symptoms for some time. A few days before death, diarrhoea develops, but it may not be marked. It is, however, accompanied by straining, which often increases in intensity and frequency, and may be so severe as to produce eversion of the rectum and haemorrhage. A considerable degree of abdominal pain is associated with the diarrhoea and straining. Cows cease to yield milk. A frenzy sometimes develops, with consequent danger to attendants. Finally, the affected animal becomes unconscious, and dies in from two to four days from the onset of diarrhoea and other definite symptoms. *Post mortem*, one finds haemorrhagic spots in the fourth stomach and cirrhosis of the liver. The latter organ is small and blue-slate in colour, and the gall-bladder is distended with bile. In some cases there is no cirrhosis, but the liver is markedly congested. Petechiae are usually found in the mucosae of the gall-bladder and of the urinary bladder, and in the heart muscle, while there may be inflammation of the small intestine around the openings of the bile ducts.



SENECIO RETRORSUS DC.

(Drawn from a specimen in the National Herbarium, No. 8848.)

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Verney [62] describes dunsiekte as follows. The earliest symptoms are yawning and gaping, but affected horses are " unthrifty " and tend to remain solitary while grazing. The sick animal is dejected, with hanging head, and loses in condition. In the stable there is a frequent tendency to support the head on some object. Minor injuries of the skin, particularly over the projecting parts of the body, are the rule, and result from collisions with portions of the stable buildings, fences, rocks, etc. Gradually an uncertain and even staggering gait develops, in which the hind legs are not lifted properly and the hoofs are dragged slightly. Occasionally this condition affects the fore legs, and results in stumbling. Early in the disease the horse is seen to sway a good deal while standing, and this is suggested as being due to weakness of the loins. In the paddock the horse is restless, and is often in trouble with fences and the like. Near the end, the animal has great difficulty in keeping its balance, and staggers from side to side like a drunken man. Periods of unconsciousness are now noted, and complete stupor may supervene. Ecchymoses are seen in the eye membranes, and icterus may be perceptible. Loss of appetite is marked throughout the course of the disease, and is accompanied by progressive deterioration in condition. Mild attacks of colic occur at intervals, and death may be accompanied by such an attack. The disease is usually afebrile, but slight fever has been recorded in some cases. The pulse rate is slightly increased, while the respiration is usually unchanged, though it may be hurried. None the less, towards the end there is acute dyspnoea with stretching of the head and neck, rapid movement of the widely distended nostrils, stridor and jerky movements of the flanks. Bile may or may not be present in the urine.

On occasion, a horse may show little, if any, sign of the symptoms of dunsiekte during life, and yet display typical cirrhotic changes in the liver *post mortem*. Often in such cases there develops a sudden attack of acute staggers, which may be the first sign of the illness, except, perhaps, loss of condition. The occurrence of these atypical cases is confirmed by the recent work of De Kock, Du Toit, and Steyn.[63]

The *post-mortem* picture here described is from Theiler.[64] The horse cadaver is, as a rule, more or less emaciated, and the skin shows many signs of fresh and healed injuries, particularly over the head and other projecting parts of the body. Slight icterus of the visible mucosae is generally noted. The chief seats of pathological change are the liver and gastro-intestinal tract. The liver is usually smaller than normal, but may be enlarged. Its surface is uneven, and feels corrugated to the finger. The colour in almost all cases is yellow or pale brownish-yellow to grey-yellow, rarely chocolate or dark brown. Blackish spots are seen through the capsule, giving the organ a speckled or mottled appearance. The substance is always tough, resists the knife when cut, and cuts with a grating sound. The stomach is usually greatly distended, and contains a large quantity of ingesta. The fundus is sometimes congested, and ecchymoses may be seen in both fundus and pylorus. The duodenal mucosa is frequently hyperaemic and swollen, but the remainder of the small intestine usually presents a normal appearance. In some cases, however, the mucous membrane throughout the length of the small intestine is reddened and swollen, and is pale or slate-coloured. A patchy hyperaemia is often found in the colon

and rectum, and haemorrhages and petechiae are sometimes observed in these parts. Ecchymoses and petechiae are frequently found in other organs of the body, and their incidence is apparently quite erratic.

Although Theiler [64] states that he regards the distension of the stomach to be an essential feature of the disease, he remarks that the liver is the chief seat of disturbance in dunsiekte.* There are " two definite well circumscribed stages," an initial and a final, " connected by more or less distinct intermediary or transition stages." The initial stage is characterised by stasis in the sublobular and central veins and adjoining capillaries. This leads to the development of so-called " blood roads " in the centre of the lobules, sometimes interconnected from lobule to lobule. Extravasation of blood and actual haemorrhage may be found around the central veins or within the lobules, irregular in shape and size, and often called " blood pools " or " blood lagoons." In such areas the liver parenchyma may have partly or completely disappeared in many of the lobules. Even at this early stage of the intoxication, what Theiler describes as an " interstitial hepatitis " may be found. It shows itself by a round-celled infiltration and the appearance of fibroblastic tissue. Actual " fibrillar connective tissue " may be seen in the very early stages of the process. In the transition stage, the " lagoons " are still present, but are not distributed so uniformly nor so centrally in the lobules as in the initial stage. They occupy " any place within the lobule." There is thickening of the walls of the sublobular and central veins, and an increase in the amount of connective tissue in the interlobular septa. In this stage the regular normal arrangement of the liver cells is disappearing, and individual liver cells and portions of cell rows are found isolated by fibrous bundles. A light brown pigment is always seen, especially in the endothelial and liver cells, but also in the septa. There may be proliferation of bile ducts. The final stage of the process is characterised by " the extremely large amount of connective tissue formed." The stasis and blood extravasations are not now seen, and often there is as much, or even more, connective tissue than liver parenchyma. Increase in the bile ducts and fatty degeneration of the surviving liver cells are frequently seen.

Early in the history of these diseases in South Africa, it was maintained that they were due to an intoxication by some species of Senecio. Thus, Robertson [42, 65] showed in 1905 that a Senecio, called at that time **Senecio latifolius DC.,** is toxic to oxen and horses, and attributed the natural diseases to this cause. Dixon,[39] by feeding the same plant, produced a condition indistinguishable from Molteno disease in horses. He also mentions the fact that if a horse is grazed for two years or more on sour veld in the East London district, it inevitably develops the symptoms. This prevented at that time (1906) the breeding of horses in this district. De Kock, Du Toit, and Steyn [63] record that dunsiekte is so severe and so prevalent in the Kokstad district that horse-breeding has been abandoned on many farms. Verney [62] likewise ascribed dunsiekte to the ingestion of Senecio latifolius DC., while Chase [41] implicated **Senecio burchellii DC.,** and showed that the plant is toxic to oxen.

* We are greatly indebted to Dr A. Sutherland Strachan, of the South African Institute for Medical Research, Head of the Department of Pathology in the University of the Witwatersrand, Johannesburg, for assistance in the interpretation of the pathological changes in dunsiekte and experimental senecio poisoning.

There is little doubt that, in coming to this decision, the earlier investigators had been influenced by the work of Gilruth [66] on *Winton disease* in New Zealand, and by the association of *Pictou disease* in Nova Scotia with Senecio. Both these diseases closely resemble dunsiekte or Molteno disease.

The work of Gilruth [66] in New Zealand, Pethwick [67] in Nova Scotia, and Chase,[41] Robertson,[42, 65] Dixon,[39] and Verney [62] in South Africa would appear to show conclusively that these diseases are produced by the eating of Senecio. This contention is supported by the very close similarity between the symptoms and pathology of dunsiekte and those of experimental senecio poisoning. Theiler,[64] on the other hand, although he [68] was able to produce a condition closely resembling dunsiekte by feeding Senecio latifolius DC. (so-called at that time), maintained that there were essential differences in the liver pathology of the two conditions; that the plant is not eaten by horses under field conditions; that horses refuse to eat the plant when it is offered to them; and that large quantities of Senecio are necessary over long periods of time to produce experimental senecio poisoning. It should be noted, however, that Gilruth [66] actually observed cattle eating Senecio jacobaea L., and that Jalving [58] is of the opinion that cattle in Holland eat both Senecio jacobaea L. and Senecio aquaticus Huds. under field conditions. De Kock, Du Toit, and Steyn [63] state that in South Africa, though horses do not eat Senecio when there is abundance of good grazing, it is difficult to conceive how they can graze on those portions of a farm upon which Senecio is abundant without daily consumption of some of the plant, especially when the plant is young and more or less of the same height as the grass. "In fact, in the early spring, horses were carefully watched during their grazing, and a fair amount of the plant was actually seen to be consumed." In the case of Gilruth,[66] it was his observation, that animals suffering from Winton disease ate Senecio while grazing, which made him investigate the toxicity of the plant. More recently, "*walking disease*" of North-Western Nebraska, a disease of horses and cattle, has been reproduced with the utmost fidelity by feeding Senecio riddellii.[69] There seems little doubt that when Senecio plants are mature, and have grown above the height of the surrounding grass, animals do not eat them readily. The danger is that young plants are cropped with the grass at a stage of their growth which makes it impossible for the animal to avoid the plant. Another interesting observation is that Senecio plants, before flowering, are more toxic than mature plants (De Kock, Du Toit, and Steyn [63]). This is supported by the observations of van Es and his co-workers [69] in Nebraska on "walking disease." This fact is significant not only from the point of view that grazing animals are more likely, as previously pointed out, to eat the plant when immature, but also from the point of view of Watt's [43] statement that preflowering material contains more than twice the quantity of alkaloids as more mature material. He isolated from **Senecio latifolius DC.**, forwarded from the Cape, 1·72 per cent. of *alkaloids* from the dried plant before flowering, and 0·76 per cent. from more mature plants. The one alkaloid he has named *senecifoline*, $C_{18}H_{27}O_8N$, and the other, *senecifolidine*, $C_{18}H_{25}O_7N$.

Senecios are widely distributed in South Africa, and there are close on one hundred and fifty species known to occur here. De Kock, Du Toit, and

Steyn [63] record that dunsiekte in equines occurs in areas in South Africa where Senecio is common, but that there are areas where Senecio is abundant and where no cases of the disease have been reported. They state, however, that it is difficult to maintain with certainty that isolated cases of dunsiekte do not occur in such areas. "From information on hand, it would appear that the distribution of dunsiekte is closely related to that of Senecio" (De Kock, Du Toit, and Steyn). These authors found in their field experiments that the greatest proportion of cases of dunsiekte occurred in the camps where Senecio was most prevalent. Theiler found difficulty in accepting the Senecio causation of dunsiekte, among other things, on account of the large quantity of Senecio which had to be fed over prolonged periods to produce experimental senecio poisoning. However, he [68] reports that as little as 6 oz. per diem is sufficient, while De Kock, Du Toit, and Steyn [63] found that 1¼ lbs. produced in one case symptoms in three days and death in six days, and record that in their Senecio experiments the total quantity of dried Senecio, drenched before death occurred, exceeded 6 lbs. in two cases only.

On the pathological side there is also evidence that dunsiekte is really a Senecio intoxication. De Kock, Du Toit, and Steyn [63] found the characteristic "blood lagoons," described by Theiler in dunsiekte, in the livers of two of their animals experimentally poisoned by Senecio. They record also "that cases of Senecio poisoning were produced [by them] which resembled the symptoms of the initial and later stages of dunsiekte described by Theiler." Again, they state that "microscopically the lesions in the liver were identical with the transition stages of dunsiekte described by Theiler." De Kock, Du Toit, and Steyn sum up the results of their experiments in the following words: "It may be stated that symptomatically and pathologically there is a very close resemblance between Senecio poisoning and dunsiekte, in fact cases were produced by drenching Senecio which could not be distinguished from dunsiekte."

Finally, the direct evidence brought forward by Cushny [44] appears to us to settle the matter beyond doubt. He carried out experiments with senecifoline and senecifolidine, the two alkaloids isolated by Watt [43] from material sent from the Cape. Cushny showed that the symptoms, *post-mortem* findings, and pathological changes in the liver in animals poisoned by the nitrates of these two alkaloids very closely resemble those found in Molteno disease, and expresses the opinion that there is no doubt that Molteno disease is a chronic Senecio poisoning. He mentions that the hepatic cirrhosis was not so complete in his experimental animals as is noted in the natural disease in stock, but states that this is sufficiently explained by the shorter duration of the intoxication in his experiments. None the less, he observed the initial stages of cirrhosis in two instances.

It is extremely difficult, if not impossible, to express any opinion upon the actual toxicological process which is taking place in Senecio poisoning. Cushny's results show that the predominant lesion in acute and subacute poisoning by Senecio alkaloids is haemorrhage, which always occurs in the liver, very frequently in the stomach and intestines, and may be seen in any organ. The haemorrhage is accompanied by fatty degeneration and necrosis of the

cells of the liver, and by great congestion of the organ. This haemorrhagic picture has been recorded by Chase,[41] Theiler,[64] and De Kock, Du Toit, and Steyn,[63] but it should be noted that there are always concurrent degenerative changes in the liver cells. The last-named authors say that "it would therefore seem that Senecio poisoning or dunsiekte in the initial stage is a disease of the circulatory system." Theiler[64] goes the length of suggesting that the primary lesion in the liver is a vasodilation, probably from overaction of the vagus. Gilruth[66] also recorded that the early stages of the liver changes are characterised by a marked portal and hepatic congestion and accumulation, especially in the interlobular tissue, of new connective tissue cells.

Are the vascular changes primary, or is the primary lesion a degenerative change in the liver parenchyma? Or, perhaps, are these two processes occurring concurrently? In the present state of our knowledge, it is impossible to say. Again, it is significant that Theiler[68] frequently notes the presence of inflammation in the duodenum in horses; Chase,[41] that the intestine in cattle is inflamed around the openings of the bile ducts; while Cushny[44] found congestive and haemorrhagic effects in the duodenum, as a rule, in his animals experimentally poisoned by Senecio alkaloids. Further, Theiler[64] regards the gastric paresis as an essential feature of dunsiekte, and does not think that it is secondary to the hepatic cirrhosis but is caused by the same agent as produces the cirrhosis. Have we, therefore, possibly a primary lesion in the duodenum leading to the development of catarrhal inflammation which, by direct spread along the ducts, ultimately affects the liver? If this were so, do the circulatory changes in the liver which are such a prominent feature occur previous to it or develop afterwards?

Another interesting fact about both dunsiekte and experimental Senecio poisoning is the association of liver lesions with mental and nervous symptoms. Such an association is known in man in hepato-lenticular degeneration, a familial disease in which there is a bilateral degeneration of the lenticular nuclei of the brain in addition to liver changes. It raises three possibilities: (i) A primary vascular effect of the Senecio alkaloids affecting first the liver and later the cerebral vessels; (ii) a primary liver degeneration due to the direct toxic effects of the alkaloids, which later are able to affect the brain as a result of inefficient trapping and detoxication of the alkaloids by the damaged liver; and (iii) a primary liver degeneration with consequent secondary nervous symptoms, resulting not from the effects of the alkaloids upon the brain but from the liver damage. The first suggestion does not seem likely for two reasons. Degeneration of the liver parenchyma is a constant and very early sign, and though the vascular changes are always recorded, there is no reason why these should not be regarded as secondary to the degeneration. Though haemorrhagic changes have been recorded in many organs, both in dunsiekte and in experimental Senecio poisoning, there is no record of haemorrhages in the brain. With regard to the second possibility, Cushny produced primary nervous symptoms in the cat and rat by both oral and subcutaneous administration of the Senecio alkaloids, which he thinks are due to "stimulation of the upper part of the central nervous axis, similar to that produced by cocaine and apomorphine." He is of the opinion that this nervous action is confined

to the medulla oblongata and higher centres. The symptoms, however, do not completely resemble those recorded in experimental Senecio poisoning in bovines and equines nor those of dunsiekte, but there is sufficient resemblance to make the theory one which is worth exploring. On the other hand, there is nothing to prevent an assumption that these acute nervous symptoms are really secondary to a rapidly produced liver degeneration. Though Hurst and Hurst [70] state that "gross disturbance of nervous function is not associated with the ordinary forms of liver cirrhosis" in man, there is plenty of evidence that nervous symptoms may develop secondarily to a liver cirrhosis, or, to put it another way, liver damage may antedate the onset of cerebral symptoms. Thus Barnes and Hurst [71] have recorded this in cases of hepato-lenticular degeneration, van Bogaert [72] has recorded a case of spasmodic torticollis following "a chronic hepatitis due to war-gas poisoning," and Schaltenbrand [73] has described a choreiform syndrome during the course of a liver cirrhosis. "In chronic manganese poisoning, cirrhosis of the liver and a syndrome closely resembling that in paralysis agitans occur together" (Hurst and Hurst [70]). On the other hand, nervous symptoms are apparently not seen in cirrhosis of the liver produced experimentally in animals by manganese.[70] It seems to us, therefore, most likely that the primary process in Senecio poisoning is probably degeneration of the liver parenchyma, and that the other effects are secondary to this. In this connection, it is interesting to note that in experiments with sodium cholate, the lesions of acute and subacute atrophy, multiple nodular hyperplasia, and cirrhosis may be produced in the liver by varying the dose of the toxic agent.[74] A further point which appears to have direct application to a consideration of Senecio poisoning is "that each of these changes may follow the injection of a single dose."

Cases of chronic poisoning by Senecio in man have been recorded, particularly from Riversdale, Cape Province. The symptoms are dyspepsia, abdominal pain, vomiting, and ascites. There is sometimes diarrhoea and gastro-intestinal haemorrhage. A large proportion of the patients die. The poisoning results from the accidental inclusion of the plant with wheat during harvesting, and ineffective sieving of the grain during milling.

The question of which species of Senecio are involved in producing these diseases in animals is under investigation by the Division of Veterinary Services and Animal Industry.[63] According to a botanical note by the Division of Plant Industry at the end of De Kock, Du Toit, and Steyn's paper, the Senecio latifolius DC. of the earlier investigators may be (*a*) the true original **Senecio latifolius DC.,** (*b*) **Senecio barbellatus DC.,** or (*c*) **Senecio retrorsus DC.** The true **Senecio latifolius DC.** has a restricted coastal distribution, from about Port St. Johns to about the Lower Umfolosi, and has probably never been used in feeding tests or other investigations.[63] **Senecio retrorsus DC.** is abundant in East Griqualand, and in the Molteno district has been shown to be toxic by De Kock, Du Toit, and Steyn,[63] and is probably the major cause of the disease in these parts. **Senecio othonniflorus DC.** cannot, however, be definitely exculpated, in view of its occurrence in these districts, while **Senecio barbellatus DC.** and **Senecio isatidius DC.** would appear to be possible causes at Kokstad, in view of their occurrence in that part. It is probable that the plant used by

SENECIO ILICIFOLIUS THUNB.

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Dixon [39] is Senecio barbellatus DC. The identity of the species investigated chemically by Watt [43] and upon which Cushny's work is based, cannot be settled in the absence of information of the precise geographical source of his material. Chase's [41] toxicological implication of **Senecio burchellii DC.** would seem to stand.

Senecio burchellii DC., Sprinkaanbos (generic name for Senecios in the Riversdale district), and **Senecio ilicifolius Thunb.,** Sprinkaanbos, are the cause of human Senecio poisoning in the Riversdale district.[45] **Senecio latifolius DC.** has always also been regarded as a cause of human Senecio poisoning, but it is impossible to state, at present, whether this is **Senecio latifolius DC.** (true), **Senecio barbellatus DC.,** or **Senecio retrorsus DC.**

Senecio serratuloides DC., Zulu *uMaphozisa*, *inTsukumbili-umahanya*, Suto *kxotodiea-ya-noko*, is used medicinally and is toxic. The Zulus drink a decoction of the leaf as a " blood purifier " for skin eruptions (syphilis) (?). They also apply the powdered leaf to sores on the skin, and the charred and powdered root to burns and sores to promote healing. A medicine made from this species and a Combretaceous plant is used by the Zulus in small doses for swollen gums and for chest pains. A woman died from taking a large dose of it as a purgative, the symptoms apparently being those of a somewhat slow irritant poisoning. We [38] extracted from the herb an *oily material* with a deep orange colour by means of petroleum ether, and a small amount of *dark green extract* with acetone. The former, given orally to a cat, caused the animal to become unsteady on its feet after a transitory slowing of the respiration. Later, the cat became weak and very drowsy. The acetone extract, given by the mouth to a cat, produced a slight transitory salivation, followed later by slight unsteadiness on the legs, and purgation.

Senecio coronatus Harv., Suto *motabo*, *papetlwane-e-tabang-kwae*, *more-moholo*, *lehlomanyane*, is a Xosa purgative. For this purpose they drink a decoction. The Sutos use the plant as an emetic and mix it with their tobacco. The administration of a decoction of the root was stated in a court case at Benoni in August 1928 to have made a woman helpless, and to have paralysed her limbs so that she could offer no resistance to being raped.[36] A Government analyst stated in his evidence that an *alkaloidal residue* isolated from the root was without effect on guinea-pigs.

Muir [37] says that **Senecio rigidus L.,** Poisonous ragwort, *in Kanga*, is toxic. We [38] have confirmed this, and find that it produces slowing of the respiration, weakness, and sprawling of the limbs in a rabbit. **Senecio pterophorus DC.** produces similar effects in the rabbit.[38]

The root of **Senecio albanensis DC.,** *var.* **leiophyllus,** Suto *lehlomanyane*, is a Suto colic remedy (Phillips).

Senecio vulgaris L., Groundsel, Kruiskruie, Suto *mohodu-ya-pela-o-monyenyane*, is an introduced species in South Africa. In Europe it is used for dysmenorrhoea and amenorrhoea, and is said to have a soothing effect on the female genital system.[46] The action is said to resemble that of ergot.[46, 47] Grandval and Lajoux [48] isolated two alkaloids from the plant, *senecionine*, $C_{18}H_{25}O_6N$, which is crystalline, and *senecine*, which is amorphous. Cushny and Watt [40] found that the plant is toxic to animals, resembling Senecio jacoboea

in toxicity and symptoms. Pammel states that the plant is astringent, and Kroeber [50] that extracts are haemostatic.

According to Bryant, the Zulus take a decoction of the leaf and stalk of **Senecio speciosus Willd.,** Zulu *iBohlololo, inZwabuhlungu,* for pleurisy and other pains in the chest. The ash of the plant is sometimes also rubbed into incisions in the side.

The Xosas apply a paste of the leaf of **Senecio deltoides Less.** to sore eyes.

A decoction of the root of **Senecio serra Sond.,** Zulu *uHlabo,* Kwena and Chuana *kxotodua,* Suto *lehlomane-le-leholo,* is a Zulu remedy for palpitation of the heart and phthisis, and a Kwena and Chuana remedy for coughs and difficult breathing.

The Xosas and Fingos apply a poultice of the leaf of **Senecio concolor DC.,** Xosa *umDambiso,* to cuts, wounds, and swellings. They sometimes use a hot decoction for the same purposes.

A decoction of the root of **Senecio orbicularis Sond.,** Zulu *iDumbe,* is taken by the Zulus for shivering fits during fever. They also use the leaf to foment swellings in animals.

The Sutos use a decoction of **Senecio serratus Sond.,** Suto *letapiso,* to wash persons suffering from swollen limbs or internal tumours (Phillips).

Phillips states that **Senecio othonniflorus DC.,** Bietou, Suto *lehlomanyane,* is a strong emetic. The plant has been suspected of producing tympanites and death in cattle, but a feeding test in a rabbit proved negative.[60]

Senecio bupleuroides DC., Suto *lehloxwane, lereka,* is an ingredient in a Suto remedy for chest troubles (Phillips). A feeding test in a sheep proved negative.[60]

The Sutos take a decoction of the root of **Senecio gerrardi Harv.,** Suto *moroborobo-o-monyenyane,* as an emetic in biliousness, and smoke the leaf of **Senecio tanacetoides Sond.,** Suto *mosuwane-wa-matlapa, molepello,* to stop nose-bleeding (Phillips).

A feeding test, in a sheep in each case, of **Senecio glutinosus Thunb.** and **Senecio pinnulatus Thunb.** proved negative.[60]

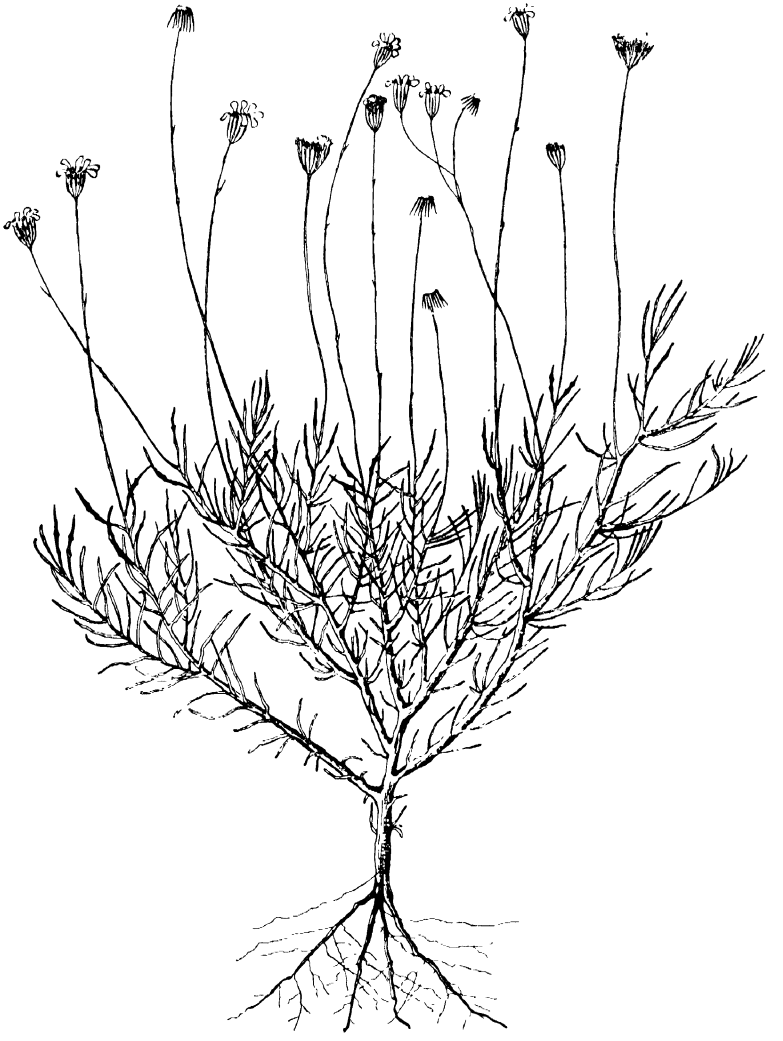
Steyn [60] records that the administration of **Senecio isatideus DC.,** Dan's cabbage, produces fatal poisoning in sheep, the plant apparently being more toxic in the flowering stage than in the late seeding stage. The symptoms are respiratory and cardiac acceleration, listlessness and weakness, and slight jaundice. *Post mortem,* the picture is that of Senecio poisoning.

The Sutos administer **Senecio asperulus DC.,** Suto *moferefere,* to horses suffering from colds, and use a decoction as a lotion for the feet and legs when aching. They also use the plant as a charm for bad dreams in children.

For colds, the Sutos smoke the leaf of **Senecio rhyncholaenus DC.,** Suto *mahwaneng,* or inhale the smoke from burning it. They drink a decoction of the root for colic, and rub the ash into incisions on the feet to relieve soreness (Phillips).

Senecio subcoraceus Schltr., Suto *ngwakwane,* is used medicinally by the Sutos (Phillips).

We [38] find that **Senecio halimifolius L.,** Tabakbos, is toxic to the rabbit, producing collapse and slowing of the respiration. **Senecio pubigerus L.** is also



SENECIO BURCHELLII DC.

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toxic to the rabbit, producing collapse, with quickening of the respiratory and heart rates.[38] Steyn [3] states that the plant is suspected of causing hepatic cirrhosis in the mule.

A decoction of the root of **Senecio dregeanus DC.,** *var.* **discoideus,** Suto *sebilwane, mantwana, lehlomane-le-lenyenyane,* is taken by the Sutos as an emetic in chest colds and as a remedy for madness (Phillips).

The Zulus use an infusion of Senecio quinquelobus DC., Zulu *iHlozi-elincane,* in influenza.

Senecio tamoides DC., Zulu *iHlozi-elikhulu,* is one of the ingredients in a Zulu remedy for " quarter evil " (anthrax).

The Sutos use **Senecio macrocephalus DC.,** *var.* **hirsutissimus,** Suto *sebea-mollo, ngwakwane-ya-loti,* for the relief of colic (Phillips).

A decoction of the root of **Senecio erubescens DC.,** Suto *letapiso,* is taken by the Sutos for nausea and rheumatic fever. They sometimes also mix the leaf with their tobacco (Phillips).

The root of **Senecio brachypodus DC.,** Suto *lephoko,* is a Swazi and Shangaan remedy for syphilis, and the Sutos take an infusion for colds and other respiratory troubles.

Steyn [3] reports that **Senecio angustifolia Willd.** is suspected of causing staggers in horses, that **Senecio fremontii Torr. and Gray** is recorded in the United States of America as the cause of a disease in horses resembling *dunsiekte* in South Africa, and that **Senecio venosus Harv.** is not acutely toxic to the sheep or the rabbit.

The Zulus use a decoction of the root of **Senecio sp.,** Zulu *uDhlutshane,* as an emetic and as an enema in chest complaints. They also take a decoction of **Senecio sp.** for the treatment of venereal diseases. The Kwenas and Chuanas administer a milk decoction of the root of **Senecio sp.,** Kwena and Chuana *mononthšwana,* to infants as a stimulant.

Phillips states that the Sutos smoke the stem of **Euryops evansii Schltr.,** Suto *sehlakwana,* to relieve headache, and use **Euryops annae Phillips,** Suto *sehalahala-sa-qoqolosi, sehlakwana-se-senyenyane,* medicinally. According to Pappe, **Euryops multifidus DC.,** Resin bush, Geel margriet, Harpuis bos, contains a *resin.*[33]

Burchell mentions that a " gum " exudes from **Euryops trifidus (Thunb.) Less.** (Othonna trifida Thunb.) and **other species** of **Othonna,** Resin bush, Harpuisbos, and that this was used by the early settlers as a substitute for resin.

The Namas take a decoction of the resin from **Euryops spp.,** Nama *d-goona,* in fevers (Laidler).

According to Phillips, the Sutos use the root of **Othonna natalensis Sch. Bip.,** Suto *naka, phela,* Zulu *inCamu,* as a vermifuge in calves. The Zulus also administer the plant as an anthelmintic, and take an infusion of the root for the relief of nausea (Bryant).

Marloth states that the foliage of **Othonna auriculaefolia Licht.,** Boegoekruie, Sandkool, is poisonous to small stock.

Gamolepis pectinata Less., Berg-kamille, is said to be used medicinally (Marloth), but we have no details.

Dimorphotheca cuneata Less., Bietou, Mak-bietou, is reported from the Middelburg district (Cape) to be toxic to sheep, causing an acute distension of the abdomen.

Dimorphotheca caulescens Harv., Suto *tosi*, is toxic to cattle, sheep, and goats, the last two named being more susceptible. When poisoned, an animal stands motionless and then collapses, with foaming from the mouth. *Post mortem*, the stomach is found to be distended with gas. It is stated that stock which is habituated to the veld where the plant grows do not eat it.

Dimorphotheca nudicaulis DC., Ox-eye daisy, Wilde-wit-margriet, is thought to be toxic.[51]

Dimorphotheca zeyheri Sond., Jakkalsbos, Bietou, Suto *kxotodiya*, is poisonous to sheep,[2, 16] but feeding experiments with dried material have proved negative.[16] The plant apparently contains a *cyanogenetic glucoside*, for Steyn [3] found the plant positive to the picrate paper test for hydrocyanic acid, and killed a sheep by drenching it with 150 grm. of the plant in the preflowering stage. The symptoms were typical of hydrocyanic acid poisoning.

The leaf of **Dimorphotheca spectabilis Schltr.,** Bietou, contains a *cyanogenetic glucoside*, and is toxic to stock and other animals.[2, 3, 52] Steyn [3] finds that the plant is toxic in both the fresh and the dry state, and that it produces symptoms typical of *hydrocyanic acid* poisoning.

Dimorphotheca ecklonis DC., Van Staden's daisy, Bietou, is toxic to cattle, producing *hydrocyanic acid* poisoning. The leaf contains 1·247 per cent., the green stem 0·374 per cent., the older brown stem 0·143 per cent., and the flower head 0·826 per cent.[53] Rosenthaler [53] states that the plant also contains a glucoside, *linamarin*, while Pammel states that it contains a *saponin*. Rosenthaler [59] states that *linamarin*, which is also named phaseolunatin, can be split into *hydrocyanic acid*, *glucose*, and *acetone*, and that the plant contains an enzyme, *linamarase*.

Dimorphotheca calendulacea Harv., Namaqualand daisy, is not toxic to sheep in doses up to 500 grm., despite the fact that the picrate paper test shows it to contain *hydrocyanic acid*.[3]

Pappe states that the root of **Garuleum bipinnatum Less.,** Snake root, Slanghoutjies, Kowerbos, was a much-prized snake-bite remedy among the early settlers. The farmers also used a decoction or a tincture of it in various diseases of the chest. Pappe states that it is diaphoretic and diuretic, the latter being a use to which the root is still put. In the Transvaal, a brandy extract of the root is one of the ingredients in a remedy for haemorrhoids used by Europeans (Pijper). Gunn [54] informs us that the root has the digitalis action.

According to Burtt-Davy,[16] natives think that **Osteospermum muricatum E. Mey.,** Suto *motlapa-tsunyana*, is poisonous to goats and cattle, particularly the former.

The Sutos believe that burning branches of **Osteospermum moniliferum L.,** Bush tick berry, Brother berries, Bokbessie, Boetebessie, Bietou, Zulu *iTholonja*, Suto *ntlo-ya-lekxwaba*, *monokotswai-wa-makxwaba*, in the hut of a madman will cure him. Marloth states that the plant is poisonous, while Walsh suspects it.

The Zulus use **Osteospermum narvatum DC.,** Zulu *uMasigcolo*, *inKuphulana*,

s an emetic in nausea accompanied by biliousness, and as a remedy in ncomplicated biliousness (Bryant).

An infusion of **Tripteris sp.**, Zulu *uMadintsana*, is taken by the Zulus as n emetic in biliousness (Bryant).

A brandy tincture of **Ursinia (Sphenogyne abrotanifolia R. Br.)**, ammetjieskruie, Fynkruie, is used as a medicine. Both the leaf and the oft stem contain a *volatile oil*, the leaf yielding 0·58 per cent.[32] The oil has a leasant, aromatic, somewhat camphoraceous odour and a burning, bitter taste. crystalline, organic basic substance has been precipitated from a decoction f the leaf, but it gives none of the alkaloidal reactions.[32]

The Xosas administer the leaf juice of **Venidium arctotoides Less.**, ousblom, Xosa *ubuShwa*, Suto *putswa-pududu*, in large doses for the treatment f epilepsy, indigestion, and catarrh of the stomach. It is said to produce ausea, and tingling in the toes and fingers. According to Smith, the Xosas lso use the leaf juice or a paste of the leaf as a local application to wounds. he application produces smarting.

The leaf of **Haplocarpha scaposa Harv.**, Xosa *isi Khali*, Suto *diteno*, *sesweu*, *apetloane*, *mereko*, *lengwako*, *disebo*, *lešala*, is a Xosa dressing for sores and ounds. The Sutos take a decoction of the root and of that of **Tephrosia emiglabra Sond.** for colds in the chest. A decoction of the root is a Suto emedy for venereal diseases and for menstrual troubles. Phillips states that uto women use the crushed leaf as an article of the toilet.

Smith and Burtt-Davy [16] both state that **Haplocarpha lyrata Harv.**, ietou, is thought to be toxic to stock, the former adding that the symptoms re swelling of the abdomen and flatulence.

A Suto purgative is made from the root of **Gazania longiscapa DC.**, Bensli a corruption of *u Benhle*), Zulu *u Benhle*, Suto *mabone*, *šweše*, and the root of **loe sp.** (Phillips).

To relieve toothache the Sutos hold in the mouth a hot decoction of the oot of **Gazania serrulata DC.**, Suto *tsikitlane*, *šweše* (flower only). Phillips ecords that they place the crushed plant, moistened with water, in the ears to elieve earache.

To prevent miscarriages the Xosas give an infusion of **Gazania pinnata Less.**, *ar.* **integrifolia**, Boterblom, Gousblom, Xosa *umKwinti*, *isAphethe*. The Sutos dminister a decoction of the root of **Gazania sp.**, *near* **Gazania jurineaefolia DC.**,)andelion, Suto *tsikitlane*, *šweše*, made with the root of **Scabiosa columbaria ..**, to cases of stricture of the urethra. It is said to cause pus to come away.

The Zulus give an infusion of **Berkheya (Stobaea speciosa DC.)**, Zulu *Maphola*, either as an enema or by the mouth, for abdominal disorders, specially pains after eating. Cawston [55] says that an infusion of the root is hought to be efficacious in bilharziasis, and is so used by the Zulus. He ested it, in rapidly increasing doses, in two cases with no improvement.

The Sutos administer a decoction of **Berkheya kuntzeii O. Hoffm.**, Suto *tswantsane*, *sehlohlo-se-seholo*, to pacify a nervous patient during illness, and hey make a lotion for bruises from the root of **Berkheya montana Wood and vans**, Suto *mohatollo* (Phillips).

According to Phillips, the Sutos use **Berkheya (Stobaea onopordifolia DC.)**,

Suto *mohato*, in feverish conditions, and together with **Euphorbia basutica** as a cure for leprosy.

The Kwenas and Chuanas (males only) drink a decoction of **Berkheya latifolia Wood and Evans,** Kwena and Chuana *diphate*, for pains in the back over the kidneys. In the Filabusi district (Southern Rhodesia) natives rub the powdered plant into swollen testicles.

The Zulus take a decoction of the roots of **Berkheya aristosa DC.,** Zulu *iPhungula*, Suto *papetlwana-e-metlwa*, and **Athrixia phylicoides DC.** for dry hacking cough.

Berkheya setifera DC., Suto *leme-la-kxomo*, *lematlana*, *uLwimi-lwenkomo*, *ntswantsane*, is one of the ingredients in a Suto remedy for sterility. A decoction of the root, made with the addition of **Dicoma anomala,** is taken by them for biliousness and jaundice. In the Eastern Transvaal, natives drink a decoction of the root for colds, coughs, and other respiratory affections.

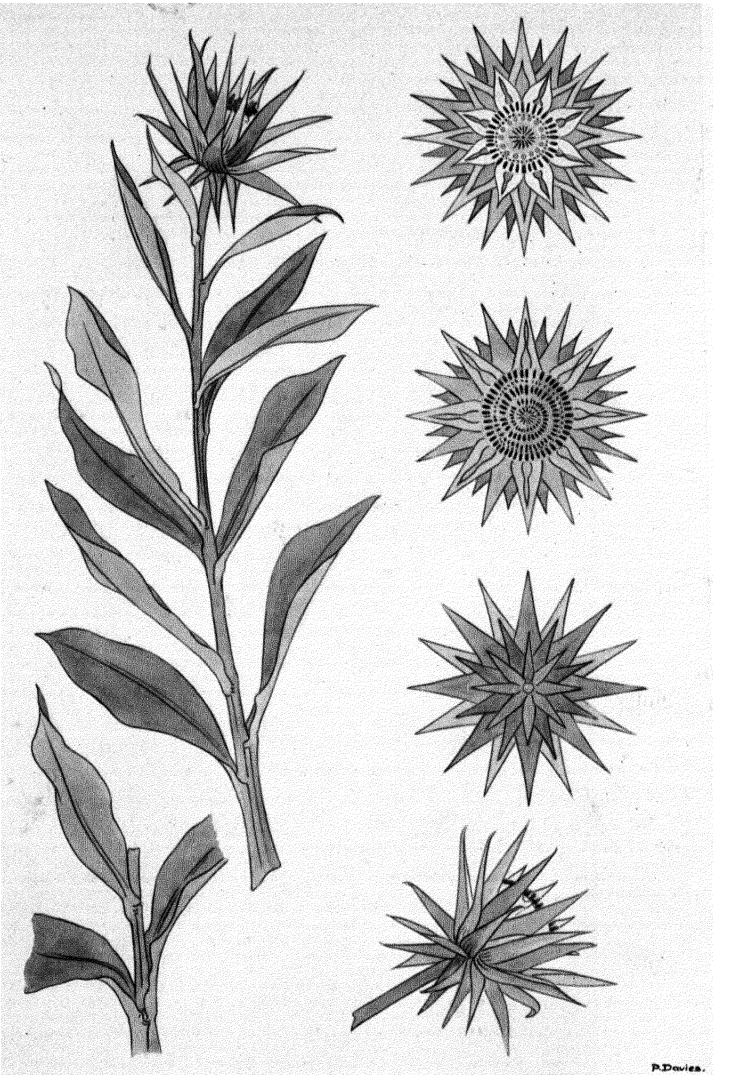
A decoction of the root of **Berkheya (Stobaea rubricaulis DC.),** Graweelwortel, is drunk by the Xosas with an idea that it dissolves vesical calculi. There seems to be some confusion about the name of this plant, for the Flora Capensis [13] says that it is **Stobaea atractyloides Thunb.,** and the Index Kewensis [56] **Berkheya carlinoides.** A decoction of **Berkheya (Stobaea afra)** is used by the Xosas in the same way. Pappe states that a tincture of the root of the former is diuretic and of great service in gravel.

The Zulus take a decoction of the root and leaf of **Berkheya sp.,** Zulu *isiHlungu*, as an enema or by the mouth, for itch. According to Laidler, the Namas take a decoction of **Berkheya sp.,** Suidissel, for shooting pains, and apply the powdered plant as a plaster to burns and boils. Bryant says that the Zulus drink a decoction of the root of **Berkheya sp.,** Zulu *uLimi-lwenkomo*, *uLimi-lwenyathi*, for urinary troubles. They steam the face over boiling leaves for the relief of pustular ophthalmia. He states that they also use an infusion of the leaf of **Berkheya sp.,** Zulu *uShaqa*, *uShwawu*, in fomenting rheumatic joints, and as an astringent lotion for sores and other skin conditions.

Europeans in South Africa take an infusion of **Cnicus benedictus L.** (Carbenia benedictus L.), Blessed thistle, Karmedik, for internal cancers, and a brandy tincture or an infusion for abdominal troubles. Formerly the plant was used in Europe as a bitter tonic, and as an emetic in larger doses.[6] The herb has a feeble, unpleasant odour, and an intensely bitter taste.[6] It contains 0·3 per cent. of *volatile oil* and *cnicin*, a non-glucosidal *bitter principle*.[47] which are the active principles. The plant contains, in addition, some *tannin* and a good deal of potassium, calcium, and magnesium salts, especially *saltpetre*.

Wicht states that a brandy tincture of **Cnicus lanceolatus Willd.,** an introduced species known as Karmedik and Wilde-karmedik, is taken by Europeans to improve appetite, and is applied as a lotion to erysipelas and ringworm.

Dicoma anomala Sond. is known as Maagbossie, Maagwortel, Gryshout, Vyfjaartjies, Swartstorm, Wormbos, Suto *hlwenya*, *hlwejane*, Zulu *uMuna*, Xosa *inNyongwane*, Wemba *nyinu*, and Chuana (?) *thlonya*. The root is a commonly used dysentery remedy. A decoction is used by Europeans and Sutos for intestinal worms and diarrhoea, and for gall-sickness in stock. The



DICOMA ZEYHERI SOND.

DICOMA ZEYHERI SOND.

Facing page 211.]

Sutos also use the decoction for venereal diseases, and apply the powdered plant to sores and wounds on horses. A decoction of the plant is a Suto purgative. The Xosas take the powdered root for the relief of colic (Smith), and the Sutos take a root decoction for a like purpose. The Sutos sometimes simply chew the root and swallow the saliva for dysenteries and diarrhoeas. The Wembas snuff the powdered root-bark for cold in the nose. It is said to cause lachrymation, sneezing, and coughing. The Zulus administer a decoction of the root, as an enema or by the mouth, to children with " blood disorders," and use the charred root as a paste for " scabby heads " in children. Bantus in general take a decoction of the plant for coughs and colds, and sometimes apply it to ringworm. Tutin and Naunton[57] have investigated the chemical composition of the plant, the material being obtained from South Africa. They isolated a small amount of *volatile oil*, a small amount of a colourless crystalline, *glucoside*, $C_{39}H_{58}O_{11}$, a small amount of an amorphous *alkaloid*, a phytosterol, $C_{28}H_{46}O$, and other substances. On account of the presence of the volatile oil, the plant is probably of some use in relieving colic, but the action of the other products isolated by Tutin and Naunton is unknown.

A decoction of the root of **Dicoma speciosa E. Mey.,** Zulu *isiHlaba-makhonjane*, is a Zulu remedy for chest ailments. Europeans and Natives take an infusion of the leaf of **Dicoma capensis Less.,** Koorsbossie, for febrile conditions. The preparation is said to be diaphoretic. In the neighbourhood of Pilgrim's Rest, natives take an infusion of the root of **Dicoma zeyheri Sond.,** Xosa *umQele*, for *umLundagazi* (a disease), and the Xosas, Fingos, and Oorlams a decoction of the root for lumbago and other pains in the back.

The Zulus apply an infusion of the root of **Gerbera piloselloides Cass.,** Zulu *inDlebe-yempithi*, Suto *tseba-pelo*, *tsebe-ya-pela*, *mothuntsetso*, made with human urine, to the ear for earache. The Sutos use a decoction of the root as a tonic and as ear-drops in earache, and a milk decoction or infusion for chest complaints. According to Phillips, the Sutos, in addition, use the plant to fumigate the hut of a person suffering from a cold in the head.

Gerbera kraussii Sch. Bip., Zulu *uHlambihloshane*, *cabazaan*, is taken by the Zulus as an anthelmintic and for the relief of stomach-ache (Bryant).

For cold in the head, the Sutos inhale the smoke from burning **Gerbera viridifolia Sch. Bip.,** Suto *moarubetswa*, *ripa-dithata*, *seboko* (Phillips).

Gerbera sp., *nearest* **Gerbera burmannii Cass.,** Danielsbos, Dialsabossie, Suto *sehoka*, is one of the ingredients in a Suto remedy for sterility.

Thunberg mentions that the early Cape settlers applied the juice of **Sonchus oleraceus L.,** Sow thistle, Melkdissel, Suigdissel, Suidissel, Seidissel, Suto *lešabe*, *bono-sa-lekxwaba*, an introduced plant, for cleansing and healing ulcers. They also made an ointment from a decoction for wounds and ulcers. The United States Dispensatory [6] states that the brownish gum obtained by evaporating the plant juice to dryness is said to be a powerful cathartic, and that it has also been used in the treatment of the opium habit. The plant does not appear to be very active, for the Sutos, according to Phillips, use it as a vegetable.

Sonchus elliotianus Hiern., known by natives in Nyasaland as *nachope* or *chatengo*, is thought to be toxic, and causes violent vomiting.

Hieracium polyodon Fries., Suto *leme-la-kxomo*, is one of the ingredients in a Suto remedy for sterility.

REFERENCES

1. R. Marloth : The Chemistry of South African Plants and Plant Products, 1913, 14.
2. E. P. Phillips : Botanical Survey of South Africa, Memoir IX, 1926, 8, 9.
3. D. G. Steyn : 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 782, 786-790.
4. C. F. Juritz : (i) So. Afr. J. Sci., 1911, viii, 100 ; 1914, xi, 121 ; (ii) Rpt. Chief Chemist (Cape Province) for the Year 1910, U.G. 16—1912, 30.
5. J. H. Harvey Pirie : J. Med. Ass. So. Afr., 1928, ii, 377.
6. United States Dispensatory, 1926, 21st Edition, 1030, 1292, 1485, 1506, 1528.
7. C. Wehmer : Die Pflanzenstoffe, 1911, 763.
8. F. Rabak : Pharm. Rev., 1905, xxiii, 81, through Chem. Cent., 1905, i, 1323.
9. N. Evers : The Chemistry of Drugs, 1926, 230.
10. J. W. C. Gunn and Deborah F. Morrison : So. Afr. Med. Record, 1924, xxii, 522.
11. A. W. Falconer : So. Afr. Med. Record, 1924, xxii, 521.
12. E. C. Bennison : Pharm. J., 1928, cxx. 318.
13. W. H. Harvey and O. W. Sonder : Flora Capensis, 1894, iii, 117, 500.
14. Pharmaceutical Journal, 1929, cxxiii, 528.
15. F. H. Ferreira : Bantu Studies, 1929, iii, 355.
16. J. Burtt-Davy : 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 195, 196, 198-200.
17. C. De Stefanis : (i) Boll. inform. econ. Ministero colonie, 1924, xiii, 37 ; (ii) Intern. Rev. Sci. Pract. Agr., ii, 905, both through Chem. Abs., 1925, xix, 2223.
18. C. F. Juritz : (i) Rpt. Senior Analyst for the Year ended 31st December 1906, Cape of Good Hope, G. 53—1907, 115 ; (ii) So. Afr. J. Sci., 1914, xi, 129.
19. D. Hutcheon : Rpt. Colonial Vet. Surg. for 1886, Cape of Good Hope, G. 14—1887, 29.
20. B. de St. J. van der Riet and G. W. B. van der Lingen : Comm. to Roy. Soc. So. Afr., 25th September 1929.
21. R. Marloth : Agr. J., Cape of Good Hope, 1909.
22. Schimmel & Co. : Geschaeftsber., April 1905, through Chem. Cent., 1905, i, 1470.
23. E. Merck : Bericht., 1894, 64.
24. L. H. Walsh : South African Poisonous Plants, 1909, 35.
25. P. J. du Toit : 13th and 14th Rpts. Dir. Vet. Educ. and Research, Union of South Africa, 1928, i, 109.
26. D. G. Steyn : J. So. Afr. Vet. Med. Ass., 1930, i, No. 4, 31.
27. (i) D. Hutcheon : Agr. J. Cape of Good Hope, 1902, xxi, 39. (ii) D. Hutcheon : Rpt. Colonial Vet. Surg. and Assist. Vet. Surg. for the Year 1899, Cape of Good Hope, G. 35—1900, 2. (iii) J. Spreull : *Ibid.*, 43. (iv) R. W. Dixon : *Ibid.*, 37. (v) R. W. Dixon : Rpt. Colonial Vet. Surg. for the Year 1895, Cape of Good Hope, G. 41—1896, 123. (vi) S. Elley : Rpts. Chief Vet. Surg. and Assist. Vet. Surg. for 1905, Cape of Good Hope, G. 47—1906, 55. (vii) D. Hutcheon : Agr. J., Dept. Agr., Cape Colony, 1893, vi, 24.
28. J. Maberly : Rpt. Jt. Meeting British Ass. Adv. Sci. and So. Afr. Ass. Adv. Sci., 1905, iii, 340.
29. E. v. Gorup-Bezanez : Ann. Chem. u. Pharm., 1854, lxxxix, 214.
30. M. Asano and T. Kanematsu : J. Pharm. Soc., Japan, 1927, No. 544, 77, 521, through Chem. Abs., 1927, xxi, 3348, and Chem. Zent., 1927, ii, 1039.
31. Bull. Imp. Inst., 1924, xxii, 279.
32. I. P. J. du Plessis : So. Afr. J. Sci., 1923, xx, 261.
33. I. B. Pole-Evans : So. Afr. J. Sci., 1920, xvi, 1.
34. W. H. Andrews : 9th and 10th Rpts. Dir. Vet. Educ. and Research, Union of South Africa, 1924, 123.
35. J. A. Goodson : Biochem. J., 1922, xvi, 489.
36. Rand Daily Mail, Johannesburg, 6th August 1928.
37. J. Muir : J. Med. Assoc. So. Afr., 1928, ii, 519.
38. J. M. Watt and Maria G. Breyer-Brandwijk : Unpublished data.
39. R. W. Dixon : Rpts. Chief Vet. Surg. and Assist. Vet. Surg. for the year 1906, Cape of Good Hope, G. 30—1907, 41.
40. W. H. Chase : Rpt. Chief Vet. Surg. for the Half-year ended 30th June 1904, Cape of Good Hope, G. 41 *—1904, 19-21.
41. W. H. Chase : Agr. J., Cape of Good Hope, 1904, xxv, 675.
42. W. Robertson : Rpt. Chief Vet. Surg. and Assist. Vet. Surg. for the Year 1905, Cape of Good Hope, G. 47—1906, 62.
43. H. E. Watt : Trans. Chem. Soc., 1909, xcv, 466.
44. A. R. Cushny : J. Pharm. Exp. Therap., 1910-11, ii, 531.
45. F. C. Willmot and G. W. Robertson : Lancet, 1920, ii, 848.
46. E. Merck : Bericht., 1897, 67 ; 1905, 78.
47. A. Tschirch : Handbuch der Pharmakognosie, iii (i), 162 ; iii (ii), 809.
48. —. Grandval and —. Lajoux : Compt. rend., 1895, cxx, 1120.
49. A. R. Cushny and H. E. Watt : Lancet, 1920, ii, 1089.
50. L. Kroeber : Pharm. Zentralh., 1922, lxiii, 437, 465, through Chem. Abs., 1922, xvi, 4297.
51. P. MacOwan : Quoted by J. Burtt-Davy in ref. No. 16.

52. I. B. Pole-Evans: The Flowering Plants of South Africa, ii, Plate 57.
53. L. Rosenthaler: Schweiz. Apoth. Zeit., 1922, lx, 234, through Chem. Abs., 1922, xvi, 2387.
54. J. W. C. Gunn: Private communication to J. M. Watt.
55. F. G. Cawston: Lancet, 1921, ii, 1049.
56. Index Kewensis, K-Z, 1895, 1001.
57. F. Tutin and W. J. S. Naunton: Pharm. J., 1913, xc, 694.
58. H. Jalving: Dissertation, University of Utrecht, 1928.
59. L. Rosenthaler: Fermentforschung, 1922, vi, 197, through Chem. Abs., 1923, xvii, 1044.
60. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 713, 715, 716, 718.
61. D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 729.
62. —. Verney: J. Comp. Path. Therap., 1911, xxiv, 226, through ref. No. 64.
63. G. de Kock, P. J. du Toit, and D. G. Steyn: 17th Rpt. Dir. Vet. Services and Animal Indust., Union of South Africa, 1931, Part II, 617.
64. A. Theiler: 7th and 8th Rpts. Dir. Vet. Research, Union of South Africa, 1920, 107.
65. W. Robertson: J. Comp. Path. Therap., 1906, xix, 97, through ref. No. 64.
66. —. Gilruth: (i) 10th Rpt. Dept. Agr., Wellington, New Zealand, 1902, 300, through ref. No. 44; (ii) Rpt. Dir. Vet. Sci., New Zealand Dept. Agr., 1902-03, i, through ref. No. 63.
67. —. Pethick: Dept. Agr. Canada. Health of Animals: Special Rpt. on Pictou Cattle Disease, Ottawa, 1906, through ref. No. 44.
68. A. Theiler: 5th and 6th Rpts. Dir. Vet. Research, Union of South Africa, 1919, 9.
69. L. van Es, L. R. Cartwell, H. M. Martin, and J. Kramer: Agr. Exp. Station, Univ. Nebraska, Res. Bull. xliii, through ref. No. 63.
70. E. W. Hurst and Phyllis E. Hurst: J. Path. Bact., 1928, xxxi, 303.
71. S. Barnes and E. W. Hurst: Brain, 1925, xlviii, 279; 1926, xlix, 36; 1929, lii, 1.
72. —. van Bogaert: J. de Neurol. et de Psychiatr., 1926, xxvi, 93, through ref. No. 70.
73. —. Schaltenbrand: Deut. Zeitschr. f. Nervenheilk., 1926, xci, 174, through ref. No. 70.
74. J. S. Young: Quoted by R. Muir, Textbook of Pathology, 1929, 2nd Edition, 546.

CXXIII. ALGAE

Pappe states that **Suhria vittata J. Ag.,** a seaweed, forms a gelatinous mass when boiled with water, and that the jelly thus formed was used with advantage as a demulcent and nutritive in respiratory affections, tuberculosis, rickets, irritation of the bladder, and other illnesses.

CXXIV. FUNGI

Claviceps paspali Stevens and Hall is a species of *ergot* infecting *Paspalum dilatatum* in South Africa. It has been recorded as producing poisoning in cattle, the symptoms being inco-ordination of movement in varying degree up to complete paralysis.[1] Hyperaesthesiae and quickening of the respiration is seen more commonly in the disease when produced experimentally.[1] Horses, donkeys, sheep, and goats seem to escape the intoxication. The fungus is the cause of ergotism in South Africa, and has been known to produce this condition elsewhere.[2]

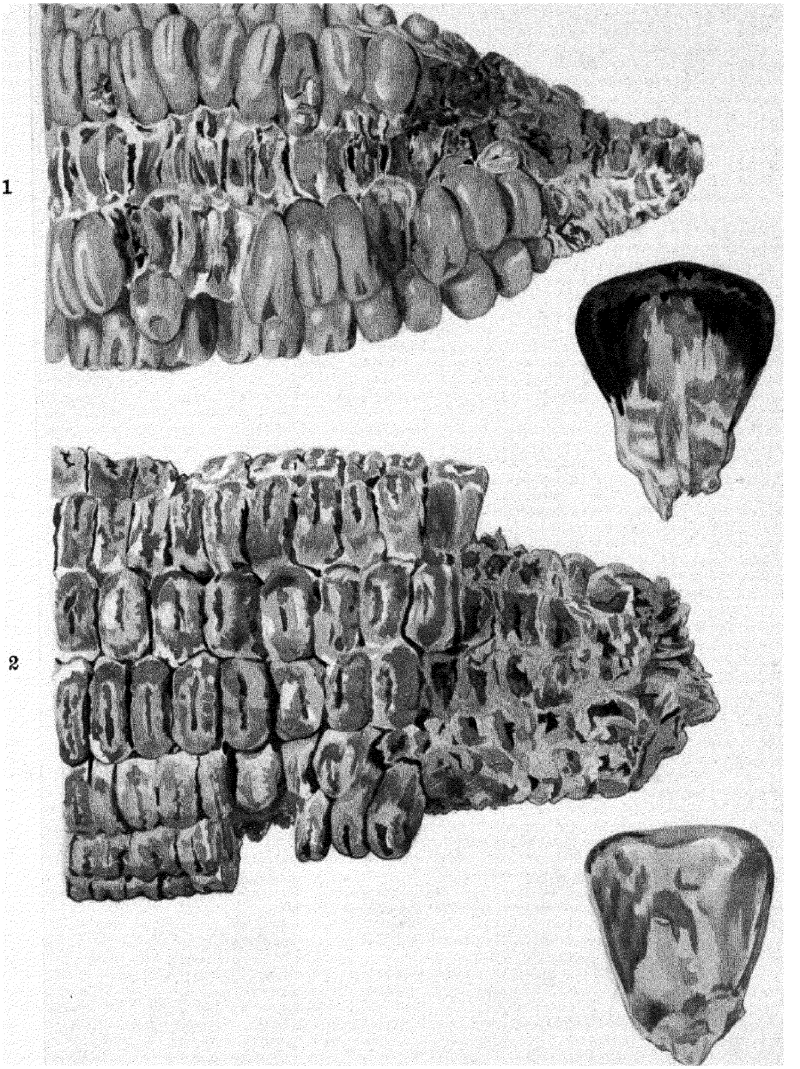
Grass containing much **Epichloe (typhina Tul.** (?)) is thought to be injurious to stock (Prillieux [3]).

Mealies infected with **Gibberella saubinetii (Mont.) Sacc.** are reported to us by a farmer as producing poisoning in stock, but unfortunately we have no details of the effects. We have reason to believe, however, that ingestion of infected mealies by cows results frequently in abortion and sometimes death. In 1928 there occurred in Germany, and to a less extent in Holland, a wholesale

outbreak of poisoning in swine by barley infected by the fungus.[4, 5] In Germany this was so serious that the German Ministry of Foodstuffs and Agriculture placed an embargo on the importation of barley from certain parts of Canada and the United States of America.[4] The symptoms in pigs were a distaste for food and severe vomiting, which sometimes proved fatal to weakly animals.[4] On the other hand, the Director of the German Institute of Milling failed to find either the fungus or any toxamine in the barley, but isolated an undetermined bacterium which fermented barley dough with the copious production of gas and the development of a repulsive butyric acid-like odour.[4] It was believed, on the basis of this work, that the microbe might produce fermentation in the stomach with the decomposition of proteins and the absorption of toxic products.[4] Subsequent investigations,[6, 7] however, proved that the trouble really arose from the presence of the fungus on the barley, and pure cultures of the fungus, when fed to swine, produced the same symptoms as the suspected American grain.[7] Analysis of several samples of the barley gave slightly higher readings of ammonia, sulphuretted hydrogen and amines than in normal samples of barley, and neither hydrocyanic acid nor alkaloids were present.[8]

A family in the Cape Province was poisoned in 1927 by eating **Amanita pantherina (DC.) Quel.,** Panther agaric, in mistake for edible mushrooms.[9] Seven persons were affected and three died. The symptoms were giddiness and weakness of the legs, with twitchings, convulsive movements, and signs of excitement in some cases. All the patients became comatose two to three hours after eating the fungus, during which state the respiration was deepened and slightly quickened. The pulse, in some cases, was slow, but quite regular and strong. Recovery from the coma took five to ten hours, and was followed by abdominal pain and tenderness, accompanied by vomiting and purging. The abdominal pain was of a persistent character. One case developed jaundice. *Post mortem*, gastric ulceration was found in one case and degenerative changes in the livers of all three fatal cases. An extract of the vomit gave the alkaloidal reactions, and resembled *muscarine* in its pharmacological action. The fungus contains *muscarine*,[10] and has been used in Japan as an intoxicant.[11]

Amanita muscaria (L.) Pers., Fly agaric, and **Amanita phalloides (Fries.) Quel.,** Death cup, Toadstool, Duiwelsbrood, Duiwelskos, Paddastoel, Slangkos, both occur in South Africa and are well known as poisonous mushrooms. In the *former* the toxic principle is *muscarine*; in the *latter* there is a *haemolytic glucoside* and a *toxin* which is the main active principle. Both are antigens. The haemolytic glucoside is identical with the *phalline* of Kobert, and is readily destroyed by cooking. Rabe states that he has isolated a muscarine-like alkaloid from Amanita phalloides. Symptoms of mushroom poisoning which are commonly seen, no matter what species of Amanita is implicated, are: "Abdominal pain, nausea, vomiting, violent diarrhoea; variable pulse; laboured respiration; consciousness unaffected, or delirium; coma or convulsions." It is worthy of note that abdominal symptoms may arise simply from the indigestibility of mushrooms. In poisoning by Amanita phalloides, symptoms do not arise for several hours after ingestion, and are as follows: "Sudden abdominal pain, with vomiting and diarrhoea, stool containing blood



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1. FUSARIUM MONILIFORME SHELD., VAR. SUBGLUTINANS RKG. AND WOLL. Mycological Herbarium, No. 20998. Watt and Brandwijk, No. 1432.

2. GIBBERELLA SAUBINETII (MONT.) SACC. Mycological Herbarium, No. 24866. Watt and Brandwijk, No. 2288.

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and mucus ; rapid loss of strength ; cyanosis ; death in two or three days." *Post mortem*, there is found degenerative changes, and even necrosis of the organs. This description of the toxic principles and symptoms of poisoning by Amanita muscaria and Amanita phalloides is based on Sollmann.[12]

Fomes rimosus Berk., Lamba *ulukumbakumba*, infects **Burkea africana Hook.** in Northern Rhodesia, but it occurs on a variety of hosts in South Africa. The Lambas burn the fungus to an ash, and eat it with salt in the treatment of colds and coughs.

Thunberg and Pappe state that **Podaxon carcinomale Fr.** (Lycyperdon carcinomale) was used by the early Cape settlers in the treatment of cancer.

Diplodia zeae (Schm.) Lev., a fungus which infects maize, is toxic to cattle when eaten. Apparently it does not affect other domestic animals. Mitchell [13] states that he was successful in producing experimental poisoning with a culture of the fungus grown on sterile maize cobs, and that the symptoms were indistinguishable from those seen in cattle poisoned by eating infected cobs on cultivated lands. He gives the following description of the intoxication. The earliest symptoms are lachrymation, salivation, and slight quivering of the muscles of the flank and shoulder. The animal is weak. The faeces are soft, but there is no diarrhoea. Later the lachrymation, salivation, and tremor become more marked, and an increasing degree of inco-ordination is observed. The affected animal tends to remain quiet, and does not walk unless urged to do so. When forced to walk, it shows marked inco-ordination, and falls after travelling a short distance. After a couple of days of these symptoms, the animal is unable to rise. The cause of death is muco-enteritis and nephritis. *Post mortem*, there is catarrhal enteritis and acute hyperaemia of the kidneys and lungs.

Fusarium moniliforme Sheld., *var.* **subglutinans Rkg. and Woll.,** has been reported to us by a farmer as a cause of abortion in cows. He states that many cows and oxen die as a result of eating mealies infected by the fungus, but we have no further details. Fusaria have been suspected of causing stock poisoning in America (Pammel).

The Pondos drink a decoction of **Parmelia conspersa Ach.,** a lichen known as *bakaliba* by the Griquas and *ubu Lembu-belitye* by the Xosas, and apply it in powder locally in the treatment of venereal diseases, especially syphilis. Hewat says that it is very bitter, and Smith that the Xosas take it internally and apply it locally as a snake-bite remedy. The lichen contains either *salazic acid* [14] or *conspersaic acid*,[15] but the significance of these, if any, is not known.

REFERENCES

1. D. T. Mitchell : 7th and 8th Rpts. Dir. Vet. Research, Union of South Africa, 1920, 441.
2. D. T. Mitchell : J. Dept. Agr., Union of South Africa, i, 422.
3. Quoted by J. Burtt-Davy in 2nd Rpt. Dir. Vet. Research, Union of South Africa, 1913, 195.
4. Mitt. Gesellsch. Vorratsschutz, 1928, iv, 66, through Rev. App. Mycology, 1929, viii, 439.
5. Deutsch. Landw. Presse, 1928, lv, 564, through Rev. App. Mycology, 1929, viii, 98.
6. —. Oppermann and —. Doenecke : Deutsch. tierärztl. Wochenschr., 1929, xxxvii, 165.
7. H. Miessner and G. Schoop : Deutsch. tierärztl. Wochenschr., 1929, xxxvii, 167.
8. P. W. Danckwortt : Deutsch. tierärztl. Wochenschr., 1929, xxxvii, 170.
9. S. F. Silberbauer and L. Mirvish : J. Med. Ass. So. Afr., 1927, i, 549.
10. R. Kobert : Lehrbuch der Intoxikationen, 1906, 2nd Edition, ii (2), 1224.
11. United States Dispensatory, 1926, 21st Edition, 1389.

12. T. Sollmann : A Manual of Pharmacology, 1926, 3rd Edition, 402.
13. D. T. Mitchell : (i) 7th and 8th Rpts. Dir. Vet. Research, Union of South Africa, 1920, 427 ; (ii) So. Afr. J. Sci., 1919, xvi, 446.
14. W. Zopf : Liebig's Ann., cccxl, 276, through Chem. Zent., 1905, ii, 898.
15. O. Hesse : J. prakt. Chem., lxxxiii, 22, through Chem. Abs., 1911, v, 2075.

CXXV. FILICES

According to Phillips, the Sutos use a decoction of the rhizome of **Cystopteris fragilis Bernh.,** Suto *lehorometso*, as an anthelmintic enema. The rhizomes of **Lomaria punctulata Kze., Asplenium furcatum Thunb., Asplenium adiantum-nigrum L., Asplenium cuneatum L.,** and **Pellaea calomelanos Link.** may be added (Phillips).

Thunberg and Pappe record that an infusion of **Adiantum aethiopicum L.,** Large maidenhair, Vrouehaar, Suto *pata-lewana*, *pata-mawa*, was formerly used for coughs and other chest affections. Phillips states that the Sutos smoke the leaf for colds in the head and chest, and Pappe that they employed a decoction of the caudex for promoting parturition.

The Sutos smoke the leaf of **Adiantum capillus-veneris L.,** Maidenhair, Suto *pata-lewana*, *pata-mawa* (both for *var.* **minor**), for head and chest colds. In Europe the plant has a reputation as a remedy in chronic pulmonary catarrh, and has been used as an emmenagogue.[1] It has been claimed that the leaf contains tannin, but Tunmann [2] finds that a watery extract gives no reaction with ferric chloride solution. The extract, however, reduces Fehling's solution, and the leaf yields a crystalline sublimate which is negative to tests for coumarin and vanillin.

A decoction of **Cheilanthes hirta Swartz.,** Parsley fern, Suto *mma-mawaneng*, *lehorometso*, *mahwane*, Zulu *in Komakoma*, is taken by the Sutos as a remedy for colds and sore throats (Phillips). The Zulus use the powdered root as an anthelmintic for tape-worm. The Kwenas and Chuanas burn the plant with **Mohria caffrorum Desv.,** and make children who suffer from sleeplessness and nightmares inhale the smoke. We suspect that the rhizome enters into the composition of a " cancer cure " in Natal.

Smith says that the Xosas smoked the leaf of **Pellaea hastata (Thunb.) Prantl.,** Hard fern, Suto *pata-lewana*, *lethšithša*, *lehorometso*, for the relief of asthma, and Phillips that the Sutos do likewise for colds in the head and chest.

The Sutos use a decoction of the rhizome of **Pellaea consobrina Hook.,** Suto *lehorometso*, as a vaginal injection in cows which do not get rid of the placenta after calving (Phillips).

According to Phillips, the Sutos use the rhizome of **Pellaea involuta Bkr.,** Suto *lehorometso*, *mosokelo*, as a diarrhoea remedy, the crushed rhizome in milk for the bites of spiders, and inhalation of the smoke from burning the leaf for colds in the head and chest. They also use the rhizome of **Pellaea calomelanos Link.,** Suto *pata-mawa*, *pata-lewana*, *lehorometso*, as an anthelmintic (see Cystopteris fragilis Bernh.), and smoke the leaf for colds in the head and chest.

The Sutos use a decoction of the rhizome of **Pteris buchanani Bkr.,** Suto *lehorometso*, as a vaginal injection in cows, to aid the expulsion of the placenta when this is retained (Phillips).

A decoction of the rhizome of **Lomaria punctulata Kze.,** Suto *lehorometso,* is a Suto anthelmintic (Phillips). (See Cystopteris fragilis Bernh.)

The leaf of **Asplenium trichomanes L.,** Suto *lehorometso,* and **Asplenium monanthemum L.,** Suto *lehorometso,* is smoked by the Sutos for colds in the head and chest (Phillips).

The rhizome of **Asplenium cuneatum L.,** Suto *lehorometso,* **Asplenium adiantum-nigrum L.,** Suto *lehorometso,* and **Asplenium furcatum Thunb.,** Suto *lehorometso,* is used as an anthelmintic by the Sutos (Phillips). (See Cystopteris fragilis Bernh.)

The Sutos administer a decoction of the rhizome of **Aspidium aculeatum Sw.,** *var.* **pungens Klf.,** Suto *lehorometso,* as an enema for intestinal worms in humans and for bots in horses (Phillips). Heffter [3] states that **Aspidium athamanticum** is used as a tape-worm remedy in South Africa.

Dryopteris athamantica (Ktze.) O. Kuntze, Suto *lehorometso,* Zulu *in Komakoma, isi Khomakoma,* is used as an anthelmintic by the Zulus, and we are informed that it has been exported for a similar purpose. Pappe states that its caudex, in the form of a powder, infusion, or electuary, is an excellent anthelmintic, especially for tape-worm.

The rhizome of **Dryopteris inaequalis O. Kuntze,** Zulu *inKomakoma,* is taken by the Zulus and the Xosas as an anthelmintic.

A decoction of the rhizome of **Nephrodium thelypteris Desv.,** Suto *lehorometso,* is injected by the Sutos into the vagina of cows to hasten the birth of the placenta when this is delayed (Phillips). **Nephrodium inaequale Hook.,** Suto *lehorometso,* and **Nephrodium athmanticum Hook.,** Suto *lehorometso, komakoma, mong-a-lebitso,* are used in the same way by the Sutos (Phillips).

A decoction of **Polypodium lanceolatum L.,** Suto *lehorometso,* is drunk by the Sutos as a remedy for colds and sore throats (Phillips).

According to Phillips, the Sutos smoke the leaf of **Nothochlaena eckloniana Kze.,** Resurrection fern, Suto *pata-lewana-la-mollo, lehorometso,* for the relief of colds in the head and chest.

A decoction of the rhizome of **Gymnogramme cordata Schl.,** Suto *lehorometso,* is drunk by the Sutos for colds and sore throats (Phillips). **Acrostichum viscosum Sw.,** Suto *lehorometso, tsebe-ya-mmutla,* is used in the same way (Phillips).

The Sutos smoke the leaf of **Mohria caffrorum Desv.,** Scented fern, Brandbossie, Suto *lehorometso,* Kwena and Chuana *mokubetso,* for the relief of colds in the head and chest (Phillips). The Kwenas and Chuanas make children suffering from sleeplessness and nightmares inhale the smoke from burning this plant and **Cheilanthus hirta Swartz.**

Pappe records that the early Cape settlers made an ointment for application to burns and scalds from the powdered leaf of **Mohria thurifraga Sw.,** Brandbossie.

A warm decoction of the rhizome of **Ophioglossum vulgatum L.,** Suto *tsêbê-ngwe, mmadiyo, tseyananyane,* is used by the Sutos as a lotion for boils (Phillips).

REFERENCES

1. United States Dispensatory, 1926, 21st Edition, 1186.
2. O. Tunmann: Schweiz. Wochschr., xlviii, 749, through Chem. Abs., 1911, v, 1157.
3. A. Heffter: Arch. exp. Path. u. Pharm., xxxviii, 458.

CXXVI. EQUISETACEAE

Equisetum ramosissimum Desf. is known as Horse-tail, Mare's-tail, Dronkgras, Transvaal dronkgras, Drilgras, Perdestert, Zulu *isi Khumukele*, Suto *mohlaka-photwane*. The Zulus administer the powdered stem in water or milk as an enema to children suffering from abdominal upsets. Barren Suto women drink a decoction of the rhizome to facilitate fertilisation, and the Sutos use it as a medicine for colds and colic in infants (Phillips). Walsh [1] states that ingestion of the plant produces an intoxication in cattle and horses, in which they stagger about and wander aimlessly over the veld, sometimes killing themselves by falling over a krantz or into a sloot. Fatal poisoning seems to be uncommon. Marloth [2] records that the plant has been proved experimentally to be toxic to horses at the Veterinary Research Laboratories at Onderstepoort. In this connection, it is interesting to note that the Sutos state that horses sweat freely after eating the plant. Curson [3] records toxicity to the ox, stating that the chief symptom is diarrhoea. On the other hand, negative feeding tests with bovines are recorded by Neser [4] and Mogg [5] in connection with the investigation of vlei-poisoning. A decoction is used as a diuretic, as a styptic especially in uterine troubles, and in the fomenting of septic inflammations.

REFERENCES

1. L. H. Walsh: South African Poisonous Plants, 1909, 23.
2. R. Marloth: The Chemistry of South African Plants and Plant Products, 1913, 7.
3. H. H. Curson: J. So. Afr. Vet. Med. Ass., 1927, i, 46.
4. C. P. Neser: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 805.
5. A. O. D. Mogg: 15th Rpt. Dir. Vet. Services, Union of South Africa, 1929, ii, 815.

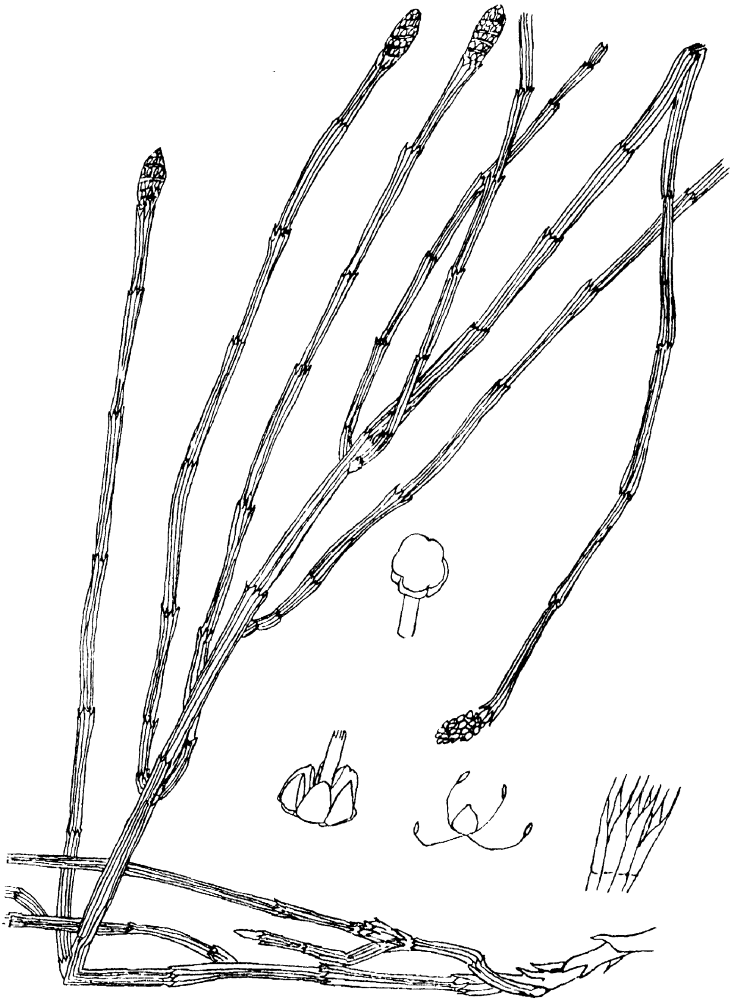
CXXVII. LYCOPODIACEAE

Lycopodium clavatum L. is known as Club moss, Stag's horn, Vegetable sulphur, Suto *moriri-wa-mafika*, *boriba-bo-boholo*. It is smoked with **Selaginella rupestris Spreng.** by the Sutos for the relief of headache (Phillips). The plant is employed as a dusting powder and for dusting pills. Overseas it was formerly used as a diuretic and antispasmodic.[1]

The powdered rhizome of **Lycopodium rupestris Spreng.,** Wild turnip, Chimanyika *hodzo*, is made into an ointment and rubbed into venereal sores by the Jindwes of Northern Rhodesia.

REFERENCE

1. United States Dispensatory, 1926, 21st Edition, 666.



EQUISETUM RAMOSISSIMUM DESF.
(After T. R. Sim.)

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CXXVIII. SELAGINELLACEAE

Selaginella rupestris Spreng., Suto *boriba*, is smoked by the Sutos along with **Lycopodium clavatum L.** for the relief of headache (Phillips).

APPENDIX I

List of publications referred to in the text by the name of Author.

1. A. Gomes de Almeida: *Plantas venenosas e medicinais dos indigenas de Moçambique*, Boletim Agricola è Pecuário, 1930, 1.
2. A. Bernhard-Smith: *Poisonous Plants of All Countries*, 1923, 2nd Edition.
3. G. Beyer: *Festschrift Meinhof*, published by J. J. Augustin, Hamburg, 1927.
4. James Bowie: *Communications to South African Institution*, Cape Town, 31st August 1829 and 30th September 1829.
5. A. T. Bryant: *Zulu Medicine and Medicine-men*, Annals of the Natal Museum, 1909, ii, 1-103.
6. W. J. Burchell: *Travels in the Interior of Southern Africa*, London, 1822-24.
7. E. J. Dijkman: *Die Suid-Afrikaanse Kook, Koek en Resepte Boek*, Paarl, 15de. Verbeterde ediesie, 1912.
8. S. S. Dornan: *Some Notes on Rhodesian Native Poisons*, South African Journal of Science, 1916, xiii, 356.
9. C. F. Ecklon: *A List of the Plants found in the District of Uitenhage, between the months of July 1829 and February 1830*, South African Quarterly Journal, 1830, No. iv, 358.
10. M. L. Hewat: *Bantu Folk Lore*, Cape Town, no date.
11. P. W. Laidler: *The Magic Medicine of the Hottentots*, South African Journal of Science, 1928, xxv, 433.
12. R. Marloth: (i) *The Flora of South Africa*, 1913-1925; (ii) *The Flora of South Africa*; Supplement: *Dictionary of the Common Names of Plants*, 1917.
13. J. Muir: (i) *The Cancer Curer in South Africa*, South African Medical Record, 1906, iv, 5; (ii) *A Contribution to the Medical Folk Lore of South Africa*, South African Medical Record, 1907, v, 148.
14. L. H. Pammel: *Manual of Poisonous Plants*, 1911.
15. L. Pappe: *Florae Capensis Medicae Prodromus*, Cape Town, 2nd Edition, 1857, and 3rd Edition, 1868.
16. E. P. Phillips: (i) *A Contribution to the Flora of the Leribe Plateau and Environs*, Annals of the South African Museum, 1917, xvi, 1-379; (ii) *A Preliminary List of the Known Poisonous Plants found in South Africa*, Botanical Survey of South Africa, Memoir IX., 1926.
17. C. Pijper: *De Volksgeneeskunst in Transvaal*, Dissertation Leiden, 1919.
18. C. G. Santesson: *Einige Drogen aus dem Kamerun-gebiete*, Arkiv für Botanik, 1926, 20A, No. 8.
19. I. Schapera: (i) *Bushman Arrow Poisons*, Bantu Studies, 1925, ii, 199; (ii) *Some Notes on Cattle Magic and Medicines of the Bechuanaland BaKxatla*, South African Journal of Science, 1930, xxvii, 557.

20. ANDREW SMITH: *A Contribution to South African Materia Medica*, 1895, 3rd Edition.

21. J. STEVENSON-HAMILTON: *The Low-Veld*, 1929.

22. G. W. STOW: *Native Races of South Africa*, 1905.

23. C. P. THUNBERG: *Travels in Europe, Africa and Asia made between the years 1770-1779*, London, 1795, 2nd English Edition.

24. A. TSCHIRCH: *Handbuch der Pharmakognosie*, 1917-25, 1st Edition. (Two volumes of the second edition have been issued, but have not been used for reference as the whole of the work is not available in this edition.)

25. L. H. WALSH: *South African Poisonous Plants*, Cape Town, 1909.

26. J. M. WATT and N. J. VAN WARMELO: *The Medicines and Practice of a Sotho Doctor*, Bantu Studies, 1930, iv, 47.

27. J. WICHT: *South African Huismiddels*, South African Medical Record, 1918, xvi, 306.

28. J. MEDLEY WOOD: *Natal Plants*, 1899-1908. (With Maurice S. Evans in vol. i.)

APPENDIX II

Method of Reporting and Sending Specimens

REPORT ON MEDICINE, CHARM, OR POISON

To

Professor J. M. WATT,
Department of Pharmacology,
University of the Witwatersrand,
Johannesburg.

Date.....

If you do not happen to have all the information asked for, just send in the notes which you have.

1. **Name :** (*a*) Common : English ..... (*b*) Botanical.....
   Afrikaans ..... Zoological, etc. .....
   Native ....
2. **Method of use, preparation and administration, including dose**.....
   (Please give full details ; attach a separate sheet if necessary.)
3. **Is it used alone or mixed with other substances ?**.....
   If so, give particulars.
4. **What diseases is it used for ?**.....
   If not used as a medicine, for what purpose is it used ?.....
5. **Describe any effects seen after taking the remedy**.....
   (*e.g.*, sweating, purging, sleepiness, etc.)
6. **What tribe(s) or people(s) use the substance ?** .....
7. **Any other remarks which you think useful**.....

Signature .... **Address**.....

Designation ....

ADDITIONAL NOTES IN THE CASE OF PLANTS.

Always send Specimens with flower and/or fruit.

1. District, Town, etc., where found .....
2. Nature of soil .....
3. Dry or moist surroundings ? .....
4. Stony or fertile ground ?.....
5. Valley, Hill, River-bed, etc. ?.....
6. Height above sea .....
7. Shrub, Bush, Tree, Creeper, Moss, etc. ? .....
8. Height of plant .....
9. Is the plant common or rare in this district ? .....

Further copies of this form will be sent on application.

APPENDIX II

Method of Reporting and Sending Specimens

RAPPORT OOR GENEESMIDDEL, TOORMIDDEL OF VERGIF.

Aan
Professor J. M. WATT,
Departement van Farmakologie,
Uniwersiteit van die Witwatersrand,
Johannesburg. Datum.....

As u nie al die informasie besit wat verlang word nie, stuur dan alleen die opmerkings wat u het.

1. **Naam :** (*a*) Gewone : Engelse..... (*b*) Natuurkundige .....
Afrikaanse..... Dierkundige, ens .....
Naturelle ....
2. **Metode van gebruik, toebereiding en toediening, met dosis**.....
(Gee asseblief volle besonderhede ; gebruik indien nodig 'n aparte stuk papier.)
3. **Word dit op sigself gebruik, of saam met ander stowwe ?**.....
So ja, gee besonderhede.
4. **Vir watter siektes word dit gebruik ?**.....
As dit nie vir medisyne gebruik word nie, vir watter doel word dit dan wel..... gebruik ?
5. **Beskrywe enige verskynsel opgemerk na gebruik van die middel**.....
(*n.l.*, sweet, purgeer, vaakheid, ens.)
6. **Watter stam(me) of ras (se) gebruik die stof ?**.....
7. **Enige verdere opmerkings wat u van nut mag beskou**.....

Handtekening..... **Adres**.....
Beroep..... .....

VERDERE OPMERKINGS IN DIE GEVAL VAN PLANTE.

Stuur altyd monsters met blomme en/of vrugte.

1. Distrik, Dorp, ens., waar dit gevind word.....
2. Grondsoort .....
3. Nat of Droë omgewing ?.....
4. Klipagtige of Vrugbare grond ?.....
5. Vallei, Heuwel, Rivier-bedding, ens. ? .....
6. Hoogte bo die see ? .....
7. Struik, Bossie, Boom, Klimplant, Mos, ens. ?.....
8. Lengte van plant ? .....
9. Is die plant volop of skaars in die distrik ?.....

Meer kopieë van hierdie vorm sal op aanvraag gestuur word.

SPECIMENS OF MEDICINAL PLANTS, ETC.

When sending in a report on any Native Medicine, Charm, or Poison, always send in specimens of the material, as it is necessary to confirm the identity in every case.

PLANTS:

Small Plants—up to about 12 in. in height.

Send two or three specimens of the complete plant, in flower. If possible, send the fruit also.

Large Plants, *e.g.*, bushes, trees, etc.

Send two or three twigs bearing leaves and flowers, and if possible, also the fruit. Send also specimens of part of plant which is used, *e.g.*, the bark.

PACKING PLANT SPECIMENS:

Lay the fresh specimens **singly and flat** between sheets of newspaper, as soon as possible after gathering. Tie up **flat** between a couple of pieces of stout cardboard or thin wood.

(Never send specimens of plants loose in a box, or packed in wet paper or moss, as they arrive in a useless condition.)

ANIMAL AND OTHER MATTER:

Pack in suitable tin, box, or bottle, each specimen in a separate container.

FORWARDING OF MATERIAL:

Union of South Africa—Post per **Agricultural Post.**

South-West Africa
South and North Rhodesia
Nyasaland
} The packets will usually be accepted per **"Sample Post."**

Portuguese East Africa
Portuguese West Africa
} Post per **"Parcel Post."**

We refund postage on all packets.

ADDRESS: Professor J. M. WATT,
Department of Pharmacology,
University of the Witwatersrand,
Johannesburg.

MONSTERS VAN GENEESKUNDIGE PLANTE, ENS.

As u 'n rapport oor enige geneesmiddel, toormiddel of vergif instuur, stuur dan altyd monsters van die materiaal wat gebruik word, want dit is in alle gevalle nodig vir identifikasie.

PLANTE :

Klein Plantjies—tot 12 duim lank. Stuur twee of drie monsters van die hele plant, met blom. Stuur, indien moontlik, ook die vrug.

Groot Plante—struike, bome, ens. Stuur twee of drie takkies met blare en blomme, en, indien moontlik, ook die vrug. Stuur ook 'n monster van die deel van die plant wat gebruik word, b.v. die bas.

DIE VERPAK VAN MONSTERPLANTE—Sit die vars monsters so gou moontlik na insameling **een vir een plat** tussen aparte blaaie van 'n koerant. Bind dit dan vas, **plat** tussen stewige karton of dun hout.

(Stuur nooit monsters van plante los in kassies, of in nat papier of mos nie, want dan kom hulle in onbruikbare kondiesie aan.)

DIERLIKE EN ANDER MATERIAAL : Stuur in geskikte blik, kissie of bottel, elke monster in aparte verpakking.

DIE VERSEND VAN MATERIAAL :

Unie van Suid-Afrika—Stuur per **" Landbou-Pos."**

Suidwes-Afrika
Suid- en Noord-Rhodesië
Nyasaland
} Pakkies word gewoonlik onder **" Monster-Pos."** aangeneem.

Portugees Wes-Afrika
Portugees Oos-Afrika
} Stuur per **" Pakket-Pos."**

Ons vergoed die posgeld op alle pakkies.

ADRES : Professor J. M. WATT,
Departement van Farmakologie,
Uniwersiteit van die Witwatersrand,
Johannesburg.

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„ . . . . . „ pycnantha Benth. 65
„ . . . . . Agave americana L. 28
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„ . . . . . Widdringtonia cupressoides Endl. 1
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H

Haemanthine . . . Buphane disticha Herb. 26, 27
Hederin . . . . Hedera helix L. 130
Hell oil . . . . Jatropha curcas L. 102
Hesperidin . . . . Citrus grandis Osbeck. 91
Hesperidine . . . . Peucedanum galbanum Bth. & Hk. 134
Hyaenanchin . . . Hyaenanche globosa Lamb. 100
Hydrastine . . . . Amaryllis belladonna L. 27
Hydrocyanic acid . . . Adenia digitata Burtt-Davy 122
„ „ . . „ glauca Schinz. 122
„ „ . . Anthephora pubescens Nees. 3
„ „ . . Aristida congesta Roem. & Schult. 3
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„ „ . . Brabeium stellatifolium L. 36
„ „ . . Chloris petraea Thunb. 3
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„ „ . . Dimorphotheca calendulacea Harv. 208
„ „ . . „ ecklonis DC. 208
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„ „ . . „ zeyheri Sond. 208
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„ „ . . Prunus persica Sieb. 63
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„ „ . . Themeda triandra Forsk. 3
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Hydroquinone	Protea mellifera L. 37
4-Hydroxyhygric acid	Croton gubouga S. Moore 100
Hyoscyamine	Datura metal L. 167
,,	,, stramonium L. 167
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Indigo	Indigofera arrecta Hochst. 73
Invertin	Verbena officinalis L. 153
Ipuranol	Buphane disticha Herb. 26
Iron	Rumex crispus L. 40
Iso-anemonic acid	Anemone transvaalensis (Szysz.) Prantl. 51
Isohyaenanchin	Hyaenanche globosa Lamb. 100
Isovaleric aldehyde	Eucalyptus globulus Labil. 129

K

Katakar oil	Argemone mexicana L. 55
Katine	Catha edulis Forsk. 110
Kino	Eucalyptus globulus Labil. 129
,,	Jatropha curcas L. 102
,,	Pterocarpus erinaceus (Poir.) Lam. 77
,, -tannin	Eucalyptus globulus Labil. 129

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Laevulose	Buphane disticha Herb. 26
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Lavender oil	Lavandula vera DC. 156
Leucodrin	Leucodendron concinnum R. Br. 37
,,	Protea mellifera L. 37
Leucoglycodrin	Leucodendron concinnum R. Br. 37
Lignoceric acid	Melia azedarach L. 94
Lime	Mesembrianthemum crystallinum L. 47
a-Limonene	Erigeron canadense L. 185
d-Limonene	,, ,, 185
Linaloöl	Mentha aquatica L. 160
,,	Tagetes minuta L. 195
,, acetate	Mentha aquatica L. 160
Linalyl acetate	Tagetes minuta L. 195
Linamarase	Dimorphotheca ecklonis DC. 208
Linamarin	,, ,, 208
Linoleic acid	Melia azedarach L. 94
Loliin	Lolium temulentum L. 5, 6
Loliine	,, ,, 5, 6
Lycorine	Amaryllis belladonna L. 27
,,	Buphane disticha Herb. 26
,,	Clivia miniata Regel. 27

M

Macleyine	Argemone mexicana L. 55
Madder	Rubia cordifolia L. 177
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Malic acid	Adansonia digitata L. 118
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,, ,,	Harpephyllum caffrum Sond. 108
,, ,,	Mesembrianthemum acinaciforme L. 46
,, ,,	,, crystallinum L. 47
,, ,,	Sclerocarya caffra Sond. 108
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Margosa oil	Melia azedarach L. 93
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,, ... ,, expansum L. 46
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,, ... Pyrus cydonia L. 62
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,, ... ,, pantherina (DC.) Quel. 214
,, ... ,, phalloides (Fries.) Quel. 214
Musennin . . . . Albizzia anthelmintica Brongn. 63
Mustard oil . . . . Brassica nigra (L.) Koch. 56
Myrcen . . . . Barosma venusta E. & Z. 90
Myrcene . . . . Tagetes minuta L. 195
Myriocarpin . . . . Cucumis myriocarpus Naud. 181
Myristic acid . . . Myrica cordifolia L. 34
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Narcissine . . . . Buphane disticha Herb. 26
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,, ,, ... ,, ferox Mill. 16
,, ,, ... ,, marlothii A. Berg. 15
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,, ... ,, mellifera L. 37
,, ... ,, species 37
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Nepodin . . . . ,, ,, ,, 41
Neriin . . . . Nerium oleander L. 145
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,, fixed . . . *see* Fixed oil
,, volatile . . . *see* Volatile oil
Oil . . . . Balanites aegyptica Delile 87
,, ... Fagara capensis Thunb. 89
,, ... Leonotis leonurus R. Br. 157
,, ... Melinus minutiflora Beauv. 3
,, ... Ximenia americana L. 39
,, ... ,, caffra Sond. 39
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,, of cajeput . . . Melaleuca leucadendron L. 129
,, of calamus . . . Acorus calamus L. 8
,, of Canada fleabane . Erigeron canadense L. 185

Oil of cassia	Acacia farnesiana Willd. 65
,, of chenopodium	Chenopodium ambrosioides L. 42
,, of fleabane	Erigeron canadense L. 185
,, of garlic	Allium sativum L. 18
,, of geranium	Pelargonium species 84
,, of Katakar	Argemone mexicana L. 55
,, of lavender	Lavandula vera DC. 156
,, of mustard	Brassica nigra (L.) Koch. 56
,, of peach kernel	Prunus persica Sied. 63
,, of pennyroyal	Mentha pulegium L. 160
,, of plumbago	Plumbago capensis Thunb. 136
,, of poco	Mentha aquatica L. 160
,, of spearmint	,, crispa L. 160
,, ,,	,, longifolia L. 160
Oleandrin	Nerium oleander L. 145
Oleic acid	Melia azedarach L. 94
Oleum erigeronis	Erigeron canadense L. 185
,, erigerontis	,, ,, 185
,, infernale	Jatropha curcas L. 102
,, menthae viridis	Mentha crispa L. 160
,, ricini majoris	Jatropha curcas L. 102
Ophelic acid	Swertia chirata Buch.-Ham. 141
Orange oil	Citrus aurantium L. 91
Organic acid	Gloriosa superba L. 10
,, ,,	Plantago major L. 173
Osyritin	Osyris abyssinica Hochst. 38
Osyritrin	,, ,, ,, 38
Ouabain	Acokanthera venenata G. Don. 142
Oxalate	Mesembrianthemum mahoni N. E. Br. 46
Oxalate, acid potassium	*see* Acid potassium oxalate
,, calcium	*see* Calcium oxalate
,, potassium	*see* Potassium oxalate
Oxalic acid	Acokanthera venenata G. Don. 142
,, ,,	Oxalis cernua (Thunb.) L. 84
,, ,,	Rumex crispus L. 40
,, ,,	Salsola kali L. 43
Oxymethyl-anthraquinone	Aloe africana Mill. 15
,, ,,	,, ferox Mill. 15
,, ,,	,, marlothii A. Berg. 15
,, ,,	,, plicatilis Mill. 15
,, ,,	Cassia fistula L. 69
,, ,,	,, obovata Collad. 68
,, ,,	,, occidentalis L. 68
,, ,,	Mirabilis jalapa L. 44
,, ,,	Rumex acetosa L. 41
,, ,,	,, crispus L. 40

P

Palmarosa oil	Andropogon schoenanthus L. *var.* versicolor Hack. 2
Palmitic acid	Melia azedarach L. 94
,, ,,	Myrica cordifolia L. 34
Pamorusa oil	Andropogon schoenanthus L. *var.* versicolor Hack. 2
Papain	Carica papaya L. 123
Papayotin	,, ,, 123
Para-cumaric acid	Aloe ferox Mill. 16
Peach kernel oil	Prunus persica Sied. 63
Pectic acid	Adansonia digitata L. 118
Pelletierine	Punica granatum L. 127
Pelosine	Cissampelos parcira L. 54
Pennyroyal oil	Mentha pulegium L. 160
Pentatriacontane	Buphane disticha Herb. 26
Perilla alcohol	Andropogon schoenanthus L. *var.* versicolor Hack. 2
Phalline	Amanita phalloides (Fries.) Quel. 214
Phaseolunatin	Dimorphotheca ecklonis DC. 208
,,	Phaseolus lunatus L. 79
Phellandrene	Schinus molle L. 108
Phosphoric acid	Luffa cylindrica Roem. *var.* lissa 180

Phytolaccin	Phytolacca americana L. 44
Phytolaccotoxin	,, ,, 44
Phytosterol	Buphane disticha Herb. 26
,,	Cluytia similis Mull. Arg. 103
,,	Dicoma anomala Sond. 211
,,	Gloriosa superba L. 10
,,	Hyaenanche globosa Lamb. 100
,,	Ornithogalum thyrsoides Jacq. 22
Picro-crocin	Crocus sativis L. 170
Pinene	Eucalyptus globulus Labil. 129
,,	Schinus molle L. 108
Pinhoen oil	Jatropha curcas L. 102
Plumbagin	Plumbago capensis Thunb. 136
Plumbago oil	,, ,, ,, 136
Poco oil	Mentha aquatica L. 160
Pompelmus oil	Citrus grandis Osbeck. 91
Potassium	Salsola kali L. 43
,, binoxalate	Rumex acetosa L. 41
,, bioxalate	Oxalis cernua (Thunb.) L. 84
,, bitartrate	Adansonia digitata L. 118
,, chloride	Ipomoea purpurea Roth. 152
,, nitrate	,, ,, ,, 152
,, ,,	Phytolacca americana L. 44
,, ,,	Withania somnifera Dun. 162
,, ,,	Zea mais L. 2
,, oxalate	Mesembrianthemum crystallinum L. 46
,, ,,	Phytolacca americana L. 44
,, oxalate, acid	Rumex acetosa L. 41
,, ,, ,,	,, acetosella L. 41
,, oxide	Erodium cicutarium l'Hérit. 82
,, tartrate, acid	Adansonia digitata L. 118
Proteacic acid	Protea mellifera L. 37
Proteacin	Leucodendron concinnum R. Br. 37
,,	Protea mellifera L. 37
Proteae syrupus	,, ,, 37
Protein	Acanthosicyos horrida Welw. 179
,,	Bauhinia esculenta Burch. 68
,,	Citrullus naudinianus Hook. 180
,,	Diplorrhynchus mossambicensis Benth. 143
,,	Luffa cylindrica Roem. *var.* lissa 180
Protopine	Argemone mexicana L. 55
Pulegone	Mentha pulegium L. 160
Pyrrolidine	Daucus carota L. 135

Q

Quebrachitol	Artemisia afra Jacq. 198
Quercetin	Osyris abyssinica Hochst. 38

R

Resin	Adenium boehmianum Schinz. 144
,,	Albizzia anthelmintica Brongn. 63
,,	Aloe ferrox Mill. 16
,,	Arctopus echinatus L. 132
,,	Aster hispidus Bhr. 185
,,	Bowiea volubilis Harv. 13
,,	Caesalpinia crista L. 69
,,	Callilepis laureola DC. 194
,,	Chlorocodon whitei Hook. f. 146
,,	Cluytia similis Mull. Arg. 103
,,	Commiphora africana Endl. 92
,,	Conopharyngia elegans Stapf. 144
,,	Copaifera mopane Kirk. 67
,,	Cucumis africanus L. f. 182
,,	,, myriocarpus Naud. 182
,,	Cyclopia tenuifolia Lehm. 70
,,	Dichapethalum cymosum (Hook.) Engl. 98

Resin	Diplorrhynchus mossambicensis Benth. 143
,,	Elephantorrhiza elephantina (Burch.) Skeels. 66
,,	Euphorbia caput medusae L. 105
,,	,, dregeana E. Mey. 105
,,	,, gregaria Marl. 105
,,	,, tirucalli L. 105
,,	Euryops multifidus DC. 207
,,	Fagara capensis Thunb. 89
,,	Gloriosa superba L. 10
,,	Hedera helix L. 130
,,	Helichrysum serpyllifolium Less. 190
,,	Ipomoea purpurea Roth. 152
,,	,, species 152
,,	Knowltonia bracteata Harv. 52
,,	Lasiosiphon meisnerianus Endl. 125
,,	Leonotis leonotis R. Br. 157
,,	,, leonuris R. Br. 157
,,	Marrubium vulgare L. 156
,,	Matricaria multiflora Fenzl. 197
,,	Melia azedarach L. 93
,,	Monsonia biflora DC. 81
,,	,, burkei Planch. 81
,,	,, ovata Cav. 81
,,	Ornithogalum thyrsoides Jacq. 22
,,	Polygala japonica 96
,,	,, tenuifolia Link. 96
,,	Polygonum tomentosum Willd. *var.* glabrum 41
,,	Sarcocaulon burmanni Sweet. 81
,,	,, patersoni DC. 81
,,	,, rigidum Schinz. 81
,,	Swertia chirata Buch.-Ham. 141
,,	Trichilia emetica Vahl. 95
Resino-tannol	Aloe ferox Mill. 16
Resinous acid	Melia azedarach L. 94
Ricin	Ricinus communis L. 101
Ricinine	,, ,, 102
Ricinoleic acid	Jatropha curcas L. 102
Rubber	Asclepias stellifera Schl. 149
,,	Diplorrhynchus mossambicensis Benth. 143
,,	Euphorbia dregeana E. Mey. 105
,,	,, gregaria Marl. 105
,,	,, tirucalli L. 105
Rumicin	Rumex crispus L. 40
,,	,, nepalensis Spreng. 41
Rutin	Ruta graveolens L. 89

S

Saffron bitter	Crocus sativus L. 170
Sal acetosellae	Oxalis cernua (Thunb.) L. 84
Salazic acid	Parmelia conspersa Ach. 215
Salicylic acid	Cluytia similis Mull. Arg. 103
,, ,,	Gloriosa superba L. 10
Saponin	Agrostemma githago L. 50
,,	Albizzia anthelmintica Brongn. 63
,,	Anagallis arvensis L. 136
,,	Balanites aegyptica Delile 87
,,	Cardiospermum helicacabum L. 112
,,	Combretum bracteosum (Hochst.) Brandis. 128
,,	Cucumis metuliferus E. Mey. 182
,,	Dimorphotheca ecklonis DC. 208
,,	Dodonaea thunbergiana E. & Z. 112
,,	Entada scandens Benth. 66
,,	Eucomis undulata Ait. 21
,,	Helinus ovata E. Mey. 115
,,	Herniaria hirsuta L. 50
,,	Hibiscus sabdariffa L. 118
,,	Mesembrianthemum crystallinum L. 47

Saponin	Phytolacca abyssinica Hoffm. 45
,,	,, dioica L. 45
,,	,, heptandra Retz. 45
,,	Raphionacme purpurea Harv. 147
,,	Securidaca longipedunculata Fresn. 97
,,	Vaccaria vulgaris Host. 51
,,	Xysmalobium undulatum R. Br. 148
Sarkokaulin	Sarcocaulon burmanni Sweet. 81
,,	,, patersoni DC. 81
,,	,, rigidum Schinz. 81
Sassa gum	Albizzia gummifera (Gmel.) C. A. Sm. 64
Scillipiain	Agapenthus umbellatus l'Hérit. 17
,,	Urginea altissima (L. f.) Bkr. 20
Scillitol	Helinus ovata E. Mey. 115
Scillitoxin	Agapanthus umbellatus l'Hérit. 17
,,	Urginea altissima (L. f.) Bkr. 20
Scopoletin	Artemisia afra Jacq. 198
Sedanolic acid	Apium graveolens L. 133
,, anhydride	,, ,, 133
Sedanolid	,, ,, 133
Sem-sem oil	Sesamum indicum L. 171
Senecifolidine	Senecio latifolius DC. 201
Senecifoline	,, ,, 201
Senecine	,, vulgaris L. 205
Senecionine	,, ,, 205
Senegin	Polygala tenuifolia Link. 96
Sesame oil	Sesamum indicum L. 171
Solancine	Solanum nigrum L. 163
Solanidine	,, ,, 163
,,	,, pseudocapsicum L. 166
Solanine	,, aculeastrum Dun. 164
,,	,, auriculatum Ait. 164
,,	,, incanum L. 165
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,,	,, pseudocapsicum L. 166
,,	,, sodomoeum L. 165
,,	,, supinum Dun. 164
Solanocapsine	,, pseudocapsicum L. 166
Somnirol	Withania somnifera Dun. 162
Somnitol	,, ,, ,, 162
Sophorine	Sophora tomentosa L. 79
Spearmint oil	Mentha crispa L. 160
,, ,,	,, longifolia Huds. 160
Spilanthol	Spilanthus acmella L. 195
Spiritus bellidis	Osmitopsis asteriscoides L.
Starch	Cyperus esculentus L. 6
,,	Plantago major L. 173
Stearic acid	Melia azedarach L. 94
,, ,,	Myrica cordifolia L. 34
Strophanthin	Nerium oleander L. 145
Sucrose	Arctopus echinatus L. 132
,,	Cyperus esculentus L. 6
Sugar	Acanthosicyos horrida Welw. 179
,,	Andropogon sorghum Brot. *var.* saccharatus Korn. 2
,,	Beta vulgaris L. 42
,,	Cluytia similis Mull. Arg. 103
,,	Crocus sativis L. 170
,,	Lasiosiphon meisnerianus Endl. 125
,,	Schinus molle L. 108
,,	Sclerocarya caffra Sond. 108
,,	Swertia chirata Buch.-Ham. 141
,,	Withania somnifera Dun. 162
Superbine	Gloriosa superba L. 10

T

Tannin	Acacia arabica Willd. 65
,,	,, ,, ,, *var.* kraussiana Bth. 65
,,	,, benthami Rochbr. 64

Tannin	Acacia cyclopis A. Gunn 65
,,	,, decurrens Willd. 65
,,	,, farnesiana Willd. 65
,,	,, mollissima Willd. 65
,,	,, pallens Rolfe 65
,,	,, pycnantha Benth. 65
,,	,, saligna Wendl. 65
,,	Adansonia digitata L. 118
,,	Adiantum capillus-veneris L. 216
,,	Avicennia officinalis L. 155
,,	Bauhinia reticulata DC. 67
,,	Brachylaena elliptica Less. 189
,,	Bruguiera gymnorrhiza Lam. 127
,,	Cassine croceum DC. 111
,,	Catha edulis Forsk. 111
,,	Ceriops candolleana Arn. 127
,,	Cnicus benedictus L. 210
,,	Cunonia capensis L. 61
,,	Curtisia faginea Ait. 135
,,	Dichapetalum cymosum (Hook.) Engl. 97
,,	Ekebergia capensis Sparrm. 94
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,,	Eucalyptus globulus Labil. 129
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,,	Fagara capensis Thunb. 89
,,	Gonioma kamassi E. Mey. 143
,,	Heeria argentea (E. Mey.) O. K. 108
,,	Helinus ovata E. Mey. 115
,,	Hyaenanche globosa Lamb. 100
,,	Hydnora africana Thunb. 40
,,	Ipomoea purpurea Roth. 152
,,	Lasiosiphon meisnerianus Endl. 125
,,	Leucospermum conocarpum R. Br. 37
,,	Lippia scaberrima Sond. 154
,,	Marrubium vulgare L. 156
,,	Melia azedarach L. 94
,,	Mensonia biflora DC. 81
,,	,, burkei Planch. 81
,,	,, ovata Cav. 81
,,	Myrsine melanophleos R. Br. 135
,,	Nuxia floribunda Benth. 140
,,	Ochna arborea Burch. 120
,,	Ocotea bullata E. Mey. 55
,,	Osyris abyssinica Hochst. 38
,,	Phytolacca abyssinica Hoffm. 45
,,	,, dioica L. 45
,,	Platylophus trifoliatus Don. 61
,,	Podocarpus elongatus l'Hérit. 1
,,	,, latifolius (Thunb.) R. Br. 1
,,	Protea grandiflora L. 37
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,,	Pterocarpus erinaceus (Poir.) Lam. 77
,,	Pteroclastrus rostratus Walp. 111
,,	,, variabilis Sond. 111
,,	Punica granatum L. 127
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,,	Rhus cotinus L. 109
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,,	Schotia brachypetala Sond. 97
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,, ... Withania somnifera Dun. 162
,, ... Ximenia americana L. 39
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,, ... Cassia occidentalis L. 68
Triacontane . . . . Artemisia afra Jacq. 198
Trihydroxyflaranon . . Citrus grandis Osbeck. 91
Trimethylamin . . . Chenopodium vulvaria L. 42

V

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Vanillin . . . . Chlorocodon whitei Hook. f. 146
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