

The following table shows the results of our analyses, and we believe show it is possible to make and keep Spirit Ethyl Nitrite of good quality:

Sample Assayed	Mch. 29, '11	Apr. 12	Apr. 26	May 10	May 24	June 7	June 21
Experiment No. 1....	4.36%	4.21%	4.11%	4.10%	4.02%	4.05%	4.01%
Experiment No. 2....	4.36	4.10	3.98	4.00	3.77	3.60	3.49
Experiment No. 3....	4.46	4.28	4.22	4.14	4.03	3.83	3.61
Experiment No. 4....	4.46	4.21	3.88	3.88	3.69	3.63	3.50
Experiment No. 5....	4.46	3.96	3.82	3.76	3.67	3.96*	3.91
Experiment No. 6....	4.46	4.05	3.93	3.77	3.55	3.89*	3.67
Experiment No. 7....	4.46	4.22	4.02	4.03	3.80	4.13*	4.09
Experiment No. 8....	4.46	4.24	4.01	3.81	3.65	4.08*	4.02
Experiment No. 9....	4.46	4.15	4.09	4.09	3.98	3.97	3.81
Experiment No. 10....	4.46	4.02	2.51	2.27	2.12	1.88	1.37
Experiment No. 11....	4.35	4.14	4.07	4.00	3.93	3.79	3.50
Experiment No. 12....	4.35	3.95	3.53	3.28	2.90	1.93	1.17

Conclusion. The deterioration of Spirit Ethyl Nitrite appears to be due to a number of contributing causes, chief among which are: (1) Hydrolysis of Ethyl Nitrite by the water contained in the alcohol used. (2) This change appears to be accelerated by the acid produced during the change. (3) Loss of Ethyl Nitrite by volatilization. (4) Effect of actinic rays of light on the Ethyl Nitrite.

Therefore, in the author's opinion, in order to produce the best and most efficient preparation it is necessary to use absolute alcohol U. S. P., in place of that now in use; to keep the product at a temperature not greater than 10° C. (50° F.) and to keep the product in as small a container as possible, better in the size package called for by the trade, and to protect it from the light by use of amber-colored bottles.

DISCUSSION.

Philip Asher stated that his experience had lead him to believe that the disturbing factor was the slight acidity of the alcohol employed. He had been able to overcome the difficulty by neutralizing the acidity with potassium bicarbonate, and had obtained a spirit of full Ethyl Nitrite content that kept fairly well.

COMBRETUM SUNDAICUM.

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Combretum sundaicum Miquel, according to Holmes (P. J., 1907, p. 77), is a shrub indigenous to Sumatra and belonging to the family *Combretaceae*; its leaves are said to have been in use for a long time by the Chinese for curing the opium smoking habit.

An infusion made from the previously roasted stalks and leaves and drunk, is said to quickly give rise to an aversion to opium smoking and hence originates the name of "anti-opium plant."

Upon analysis only tannins and gums have been found, and hence the difficulty to understand the action of the drug. A thought was advanced in Merck's

* Original one-ounce bottle.

Manual of Materia Medica (supplement to, 1905, page 36) that the drug may contain caffeine, a substance well known to be an antidote in acute opium poisoning.

Harrison (P. J., 1908, p. 52) has investigated the chemical character of Combretum, chiefly directing his attention to the detection of either an alkaloid or a glucosid, but failed in this respect. He found a resin to which the action of the drug could be attributed.

Through the courtesy of Mr. Henry C. Blair of Philadelphia, we were provided with authentic specimens of the drug, which was investigated by us both chemically and clinically.

In making the proximate analysis the well known scheme of H. B. Parsons as found in Lyons' Pharmaceutical Assaying (1886) was followed. It, in the opinion of the writer, would be an unnecessary procedure to recapitulate herein the scheme, so only the important findings are presented.

Five grams of Combretum in No. 80 powder taken for analysis:

Moisture	3.300%	
Ash	7.500%	
Residue from benzoic extraction.....	10.600%	
Residue treated with water and evaporated with one drop of hydrochloric acid to dryness at 100 C.; then heated to 110 C. weighed.....		0.225 Gm.
Residue from benzoic extraction treated with 30 Cc. warm water, filtered and divided into aliquot portions A and B.		
Solution A evaporated to dryness gave a residue. This residue ignited gave ash.....		0.008 Gm. 0.002 Gm.
Solution B was tested for alkaloid with Mayer's, Wagner's and Scheibler's reagents.....		None found
Solution B—another portion was tested for glucose by Fehling's test.....		None found
Solution B was tested for organic acids: Found gallic acid		A trace
Benzoic solution treated with alcohol (0.848) several times, then filtered and evaporated, gave a residue		0.155 Gm.
An alcohol solution was tested for camphors.....		None found
An alcohol solution was tested for resins with acidified water, the residue dried and weighed		0.013 Gm.
Chlorophyll was found.....		Abundant
Calvert test gave no indication of the presence of fixed oils.		
The final residue proved to be a caoutchouc-like substance, dark green in color, and soluble in 4.9 parts of benzol, freely soluble in chloroform, sparingly in ether, but insoluble in either water or alcohol.		
The marc from the first extraction was hot—repercolated with alcohol (0.848) for twelve hours—the extract evaporated. The residue dried and weighed.....		0.55 Gm.
An alcoholic solution precipitated with ammoniacal zinc acetate solution gave partly tannin, which dried at 120° C. weighed.....		0.235 Gm.

The precipitate ignited gave ash.....		0.195 Gm.
Difference in tannin weight.....		0.040 Gm., or
found tannin	1.000%	
Basic lead acetate precipitate—treated in the same fashion as the previous gave tannin.....		0.012 Gm.
Total tannin found.....	1.002%	
The filtrate precipitated with sulphuric acid and tested with Fehling solution for glucose.....		None found
The marc from the alcoholic extraction, dried at 100 C. was macerated 10 hours with 100 Cc. of water and filtered. The filtrate was divided in three portions, A, B and C.		
Portion A—evaporated, dried at 110° C. weighed.		0.038 Gm.
Residue ignited gave ash.....		0.0013 Gm.
Portion B—tested with iodine solution gave indica- tion of the presence of erythro-dextrin.		
Portion C—tested with ammonium oxalate gave no calcium test.		
When tested with dilute hydrochloric acid a gelatinous precipitate consisting of pectic acid was obtained.		
The marc from the water extraction washed with alcohol and dried at 100° C. weighed....		3.492 Gm.
This was treated with 100 Cc's of water, contain- ing 5 Cc. of sulphuric acid—heated until a drop of it gave no coloration with iodine. No color whatever was obtained. The specific gravity of the liquid was determined and was found to be.....		1.0011 Gm.
The excess over 1.000 or .0011 divided by eight equals	0.00011% of starch found	
From the above we deduce that the probable prin- ciples which are active may be the peculiar tannin, the resin and the caoutchouc-like sub- stance found in the drug, and which latter in the process of roasting may become so modi- fied and rearranged as to give rise to some new principle to which the so highly lauded effects as noticed by the Chinese may be as- cribed.		

Credit is herein given Mr. Robert P. Fischelis, Ph. G., for valuable assistance rendered during this investigation.—I. V. S. S.

REPORT OF A CASE OF OPIUM HABIT TREATED WITH COMBRETUM SUNDIACUM.

This plant is a woody climber, belonging to the family of Combretaceae and is found abundantly in the Malay Peninsula, especially in Selangor. A botanical description of it is not necessary as it is a recognized plant in all of the standard botanical works dealing with this part of the world. The story of its introduction into Chinese medicine is given by Wray, which is one of those highly characteristic improbable romances which have been associated especially with nostrums and Chinese remedies. The story goes, that a party of Chinese woodcutters having run out of tea prepared an infusion from this plant as a substitute for their national drink, and in some way, accidentally, opium got mixed with it, and

after taking this mixture for a week they found that their craving for opium had entirely disappeared.

The method of using it in China is stated by Wray to be as follows: The twigs and leaves of the plant are chopped up into pieces of about an inch in length and dried for several days and then the woody portions of the twigs are separated from the leaves by a winnowing process and set aside in a separate sack. The leaves are then thoroughly roasted and mixed again with the sticks. From this mixture a decoction is prepared by boiling eight to ten ounces of the plant in four gallons of water for several hours. This liquid is then strained through a cloth and used before time for decomposition. The opium habitue takes his ordinary daily dose of opium, mixes it with a quart of the decoction and from this bottle he takes at the intervals at which he was accustomed to smoke, a dose of three ounces of this mixture and fills up the bottle with pure decoction of combretum. This method of preparation and use differs a little in details from that which we have seen elsewhere described but in principle all of these methods of employment are that long established practice of gradual reduction in the dose of the narcotic. Even the method of adding an inert substitute for replacing the daily dose of opium taken from a stock bottle is a well recognized method of reducing the dose. I myself have had occasion in treating a patient who had acquired the paregoric habit, to have a preparation made exactly according to the formula of the U. S. Pharmacopeia for camphorated tincture of opium, omitting only the opium and substituting this preparation in the same method as recommended for combretum.

The plant appears to have been used to a considerable extent in the Malay Peninsula and China for the relief of the opium habit. The statements which are made concerning the results from this treatment are, however, vague in the extreme as to the results. I have not yet been able to find a single detailed report of a case treated by the method although there are several articles in which the drug was claimed to have been used with good results. The only trial of the remedy which has been published in this country so far as I know is in the paper of Heffner, read before the Pennsylvania Pharmaceutical Association in 1910. This paper comes the nearest to describing the effects in an actual case of any communication I have seen, although there is no detailed report. The case mentioned after ten weeks' treatment was entirely cured of the opium habit. Heffner also states that others have obtained favorable results from the plant but gives no reference to the literature. It has seemed to me, therefore, worth while to briefly describe the effects which I have noted in a marked case of opium habit.

L. R., aged 37. Some four or five years ago acquired the opium habit through the use of Bull's Cough Syrup, later using paregoric and laudanum. After realizing that he had acquired the opium habit, he took the Contrell Opium Cure, for which he paid \$5.00 a week, and after a month's treatment learned that the cure contained morphine. Later he used the alkaloid and states that he has taken as high as forty grains a day of morphine, in from three to five grain doses. About one and one-half years ago he was treated at a hospital and for two weeks after leaving did not take any opium but was now using between three and four ounces of laudanum a day. He was admitted to the Medico-Chirurgical Hospital in April, 1911. An eight-ounce bottle was filled with a mixture of equal parts of tincture of opium and an infusion of combretum (prepared by Prof. Stanislaus).

Of this mixture he was given one tablespoonful every two hours and for each dose that was taken out there was poured in an equal quantity of the infusion of combretum. During the first week, although he was not sleeping well and was distinctly nervous, the symptoms were in no way violent. At the end of this time, however, he became extremely restless and suffered intensely with insomnia, although there was no diarrhoea. The second week of his stay in the hospital was no whit less painful to him than to the opium habitué under ordinary treatment. As the combretum did not seem to exercise any quieting action whatsoever it was stopped and the case treated along conventional lines. He remained in the hospital about six weeks and so far has not returned to the drug.

While from this single case one is, of course, not justified in drawing definite conclusions, it does not seem to me probable that the plant exercises any peculiar effect upon the central nervous system which would explain its action in opium habit. It seems perfectly plausible to ascribe its virtues to the large percentage of tannic acid which it contains. When the infusion is mixed with the opium there is a heavy precipitate consisting, presumably, largely of the tannates of the opium alkaloids. As we administered it, the bottle was always well shaken so that these were also taken.

The effect of the tannic acid will be two-fold. In the first place one of the most troublesome symptoms of the withdrawal of the opium is diarrhoea, which, of course, the tannin would tend to restrain and as the dose of tannin in the method of administration recommended is proportionate to the amount of opium withdrawn, the need of the intestines is gradually met as it occurs. The second factor which has occurred to me, is that the tannate of morphine which is formed, being but very sparingly soluble is absorbed from the intestinal tract very slowly so that instead of the abrupt pleasurable effects of the opium the drug is so slowly absorbed that the patient is continually under a comparatively mild degree of narcotic effect. This, while not sufficient to give rise to the pleasurable sensations is sufficient to prevent the violent disturbances of the nervous system so that with a little determination the patient is able to endure for a time without the drug. As far as I can determine it has been the experience of others that the drug is more useful in reducing the dose than in producing complete cures.

I believe that combretum sundiacum is of service in the treatment of the opium habit, but whether it is of any more service than tannic acid or the other vegetable astringents, I am not prepared at present to say.—H. C. W., Jr.

THE RED TAPE OF DUTY.

“The boy who ‘stood on the burning deck,’ and who committed suicide on a technical point of obedience, has been held up to the school children of this century as a model of faithfulness to duty. The boy was the victim of a blind adherence to the red tape of duty. He was placing the whole responsibility for his acts on some one outside himself. He was helplessly waiting for instruction in the hour of emergency when he should have acted for himself. His act was an empty sacrifice. It was a useless throwing away of human life. It did no good to the father, to the boy, to the ship, or to the nation.”—*William George Jordan.*