Eucalyptus oil, as used within its usual dose limits of \( \frac{1}{2} \) to 3 minims, seems never to give rise to any toxic symptoms, but a remedy such as this, which has almost become a misnomer, is apt to be used by the like, has, in not a few cases, been taken by mistake in larger doses, and in some cases with poisonous effect. The number of such cases is as yet but small (in fact scarcely over a dozen) and their record is naturally fragmentary, as all notes of poisoning are apt to be lost or forgotten. Therapeutic measures must prevent detailed study of the resulting clinical phenomena. In these cases of eucalyptus poisoning the symptoms have varied greatly according to the amount of oil taken, and apparently also according to the variation of the patient. Incidentally it may be mentioned that Davies\(^{14}\) knew a patient who fainted even with the smell of it.

In general, toxic symptoms have been noted after doses of 1 drachm or more, and Dr. S. Taylor\(^{2}\) speaks of his patient who felt a little giddiness and confusion after \( \frac{1}{4} \) drachm. Most of the cases, however, developed marked toxic symptoms after doses of 1 drachm or more, as in those of Taylor,\(^{11}\) Benham,\(^{12}\) the two of Atkinson,\(^{13}\) a case of Kunkel,\(^{1}\) and in the case of Otta. In other cases the dose of eucalyptus oil taken was 2 drachms, as in that of Orr,\(^{15}\) 3 drachms or even 6 drachms, as in the cases of Benjamin\(^{14}\) and Myott.\(^{2}\)

With such different dosage the time of onset of toxic symptoms will naturally vary greatly—from ten minutes in one case to one or two hours in another. In like manner the kind of symptoms and the order of their development have shown differences. Vomiting was generally the first sign—in the case reported by Kunkel\(^{1}\) it was almost the only symptom—and it was generally followed by abdominal pain and diarrhoea. In most of the cases, whether preceded by gastro-intestinal irritation or not, unconsciousness, varying in degree from mere drowsiness to coma, supervened.

In no case symptom noticed was a giddiness, as in the cases of Kinns,\(^{13}\) Sheaf,\(^{3}\) and Taylor.\(^{2}\) In all but the slightest cases further effects manifested themselves in pallor, quick pulse, and general collapse, as well as frequently respiratory disturbance. No after-effects were noticed beyond the temporary order of the patient. Benjamin,\(^{14}\) where a boy ill with remittent fever had got by mistake 6 drachms.

Nevinny\(^{4}\) in 1898 mentioned that a fatal result had not yet been observed, but since then several have been put on the records.\(^{5}\) Some of the cases have been reported by Dr. K. H. Cartwright,\(^{6}\) who has had a case of syphilitic meningitis of some 24 days duration. After giving 4 grains, his patient died within forty hours after taking the oil. The post-mortem examination showed a large amount of pus in the trachea and bronchi. Nevinny also reports a fatal case.

The explanation of these toxic cases has not so far been satisfactorily explained.\(^{7}\) Some\(^{1}\) say that pure eucalyptus oil is very slightly active, and that 10 grains produces no effect; others,\(^{8}\) while Cuthbert Hall\(^{9}\) considers that eucalyptol—the chief constituent—has probably very little toxic result. Manqu\(^{10}\) quotes the experiences of Bouveret and Pescadre with the subcutaneous injection of eucalyptus oil in man and rabbit, where the patients sometimes felt a heat in the abdomen, and at other times showed symptoms of cerebral phenomena of a more or less uncomfortable nature.

Some, like Manqu\(^{11}\) mentions, noted with a dose of 3\( \frac{1}{2} \) grams headache and mental prostration. The other phenomena are like those produced by turpentine—coma, weakness of reflexes and of the respiration, lowering of the blood pressure and temperature, and in fatal cases respiratory paralysis. Kunkel,\(^{1}\) in discussing his case, considered it may have been caused by another kind of eucalyptus oil, or else that it might be due to an adulleration.

**REFERENCES.**

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**THE CURATIVE EFFECT OF SALVARSAN (“606”) IN CASES OF FRAMBOESIA.**

**BY HENRY ALSTON, M.B.**

**GOVERNMENT MEDICAL OFFICER, TRINIDAD.**

The following experiences were carried out at the St. Augustine Yaws Hospital, Trinidad, from January 4th onwards. On that day Dr. Rost, the surgeon at the General Hospital, sent me a case of Framboesia, which had been brought in to Kiel, by my request kindly injected five cases of yaws, three adults and two children. Dr. Rost used 0.6 gram (9 grains) in an emulsion with 5 to 6 c.c.m. of sterilized olive oil for adults. The injection was made deeply into the muscle of the arm.

In twenty-four hours a marked improvement was noticeable, the yaws inelastic drying up from the periphery, so that the whitish circles appeared to be surrounding them. The improvement continued, and on January 11th I decided to try an experiment with serum. I had read that in the case of an injected syphilitic mother and suckling the baby was cured by suckling the mother; and I was also aware of Professor Ehrlich’s view that “606” created an antibody by rapidly destroying syphiliotics. I therefore put a cantharides blister on two of the cases being cured by the “606” treatment, and injected the serum from the blister into several cases of yaws, the adult dose being 16 c.c.m. To my astonishment, the serum acted as rapidly as “606”. In some cases improvement was noticed in sixteen hours after injection. On January 11th, at my request, Dr. Rost injected thirteen more cases of yaws with “606,” and the same rapid improvement was noticeable—in some cases as early as sixteen hours. Blisters to absorb the serum, and used the serum for more experiments. In every case injected with serum I got a rapid improvement.

I ought to inject the serum cases every seven or ten days; but I am leaving them alone to see how long the improvement will last. I have also used “606” in Framboesia with equal success.

On January 17th the Yaws Hospital was visited by the Acting Surgeon-General, Dr. J. W. Eakin, Dr. Rost, and two of my comrades, who saw all the cases under treatment both with “606” and serum, and who also saw the patients under my care. I believe that this is the first instance known of a drug producing an antitoxic serum with curative properties, and the effect, in a boy, of injecting 2 drachms and 20 minims of a serum that had not been hyper-immunized, was very astonishing.

But a greater astonishment was to come. I put a cantharides blister on two cases that were being cured by the serum from a “606” case, and in both an improvement was noticeable in twenty-four hours. Being boys, each received 8 c.c.m. of serum to counteract the effect due to the drug or on an antitoxin. The dilution is very great in what I call the secondary serum cases. It occurred to me that the results I obtained with serum was to be explained if the failure of a second dose was due to the absence of complement in the blood of yaws patients. I argued that it was possible that the antibody...
It is now holding of normal mixed, as through the glass and toxin. If I added until the fluid is apt to become viscid, and would certainly block an ordinary needle.

The urine must be tested in every case before injection and after treatment. The skin, sometimes, counting three experiments:

1. I put a fly blister on some healthy persons, and injected normal human serum into yaws cases. No result followed.

2. I heated the serum from cases that were being cured along with injections, and the serum, even after boiling, was efficacious.

3. I put blisters on three cases of yaws, and used the patients’ own serum for their injection. No result.

I have therefore abandoned the provisional hypothesis of fixation of the yaws toxin. I also performed the following control experiments:

1. I injected sterilized water with tincture of cantharides, and satisfied myself that the presence of cantharides in the serum has no effect whatever.

2. I injected four cases with caustic soda for comparison, and I see nothing to compare with the experiments with “606” and the serum.

A further experiment with normal human serum obtained by a blister was negative.

It is my intention to inject a goat with “606,” and use the goat’s milk for young children with yaws. I will also blister cases that have been cured of yaws under ordinary treatment and experiment with their serum. If it is impossible to obtain spirochaetes, I suggest that spirochaetes be injected in the lower; that this be followed by “606” injections, and that experiments be made with the serum in cases of syphilis.

When the experiments were carried on, no other treatment of any kind was used or allowed, except a wash or not permitted. No complications, local or general, occurred. I believe that the dose of “606” for yaws can be safely increased, as the reaction was slight, and in some cases absent. Cases will require a second injection. The pain after the injection of the emulsion lasts for about six hours, but is not very great. Dr. Rost intends to publish the cases injected by him with “606.” We owe him a debt of gratitude for so willingly using his “606” tubes in yaws cases. The blisters were applied on the fourth day after injection with “606,” or with the serum of a “606” case.

In the light of marked effects in the secondary serum cases we may have to change the hypothesis of the formation of an antibody by the injections. The curative stage may have to have the power of increasing itself. Is it a ferment?

A REPORT ON THREE CASES TREATED WITH EHRLICH’S SPECIFIC FOR SYphilis.

By E. G. FFRENCHE, M.D., F.R.C.S.ED., Captain R.A.M.C., Station Hospital, Ahmednagar, Southern India.

Through the kindness of Mr. J. E. R. McDonagh of the London Lock Hospital, who spared me a few tubes of “606,” I have been able to carry out Ehrlich’s treatment in three selected cases of syphilis. I had the good fortune to obtain three typical syphilitic cases in London, and have endeavoured to treat the cases after his method.

The doses were received in the form of a yellow powder hermetically sealed in glass ampoules, the dose ranging from 0.3 to 0.9 gram. One end of the glass ampoule is broken off, and the contents turned out into a glass mortar which has been sterilized. The powder is dissolved first of all in as small a quantity of ethyl alcohol as possible. To this is added about 10 c.c.m. of hot water, and the fluids stirred vigorously until every trace has been dissolved; then a small quantity of solution of sodium hydride (40 grams to the litre) is added, well mixed, and three drops of a 1 per cent. alcoholic solution of phenolphtaline added, and titrated with normal acetic acid until the red colour has completely disappeared. Finally, a few drops of normal sodium hydride are added until a faint rose tint comes back to remain, so that the solution is just alkaline. The solution is now ready for injection. A fairly large syringe capable of holding 12 c.c.m. and fitted with a long needle is used. It is necessary to have a needle with a large bore, as sometimes the fluid is apt to become viscid, and would certainly block an ordinary needle.

The urine must be tested in every case before injection and after treatment. The skin, sometimes, counting three experiments:

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