resulted in negligible extraction of ascorbic acid—about 0.02 mg. per c.cm. (cf. Dr. K. E. Barlow, *Journal*, 1941, **1**, 797). On physico-chemical grounds we had regarded as suspect the apparently almost miraculous properties attributed to sucrose as an extractant of ascorbic acid.

Secondly, the grated vegetables were simply squeezed through muslin; juices containing 0.30 mg. and 0.32 mg. of ascorbic acid per c.cm. were thus obtained from swedes and turnips respectively. It might, however, be thought by some that such expressed juices would be unfit for infant feeding unless sterilized by boiling; moreover, the effect on the ascorbic acid content of any ascorbic oxidase present might be significant if the expressed juices were allowed to stand. Boiling would of course destroy any enzymes present. We therefore examined the effect of boiling on the squeezed-out juice. When boiled for periods up to fifteen minutes, and whether brought to the boil slowly or quickly, the juice showed no destruction of ascorbic acid. Prolonged boiling—for thirty minutes or more—sometimes produced slight losses. Exposure to the atmosphere in covered beakers without agitation produced no losses in three to six hours, and up to 25% loss in twenty-four hours; if, however, the juice was agitated (stirred) periodically the loss was more rapid and might amount to 75% in twenty-four hours. We conclude, therefore, that expressed juice can safely be boiled for a few moments and can be kept (whether unboiled or boiled) for several hours, provided it is covered and not vigorously stirred, without any serious loss of antiscorbutic activity.

Thirdly, the roots can be sliced and boiled with a little water, the cooked mass being then squeezed through muslin into the cooking water. The concentration of ascorbic acid in the resulting liquor will naturally depend on the amount of water used, among other things. Even when this was reduced to a minimum—just enough to cover the vegetables—the liquors were less good sources of ascorbic acid than the cold-pressed juices discussed above. Nevertheless both swede and turnip yielded liquors containing from 5 to 16 mg. of ascorbic acid per 100 c.cm. The comparison between the cold-pressed juices and the cooked liquors must not be carried too far; different samples of vegetables were used at different times in the year; and no properly controlled comparison was carried out in this purely preliminary investigation. Our results indicate, however, that cooking, because of the inevitable dilution of the juice and possibly also owing to some destruction, gives a solution of ascorbic acid somewhat less concentrated than the raw or cooked cold-pressed juice, but still a very useful antiscorbutic for use in infant feeding under present conditions.

Source	Author and Reference	Raw (mg. per 100 gm.)	Cooked (mg. per 100 gm. orig. Raw Material)	Cold Pressed Juice (mg. per 100 c.cm.)	Cooked Liquor (mg. per 100 c.cm.)
Turnip	Present	14 to 16	10 to 17	19 to 32	5 to 16
,,	Chappell (1940)	11 to 22	—	—	—
,,	Olliver (1936)	17 to 36	—	—	—
,,	,, (1940)	—	11 to 17	—	—
Swede	Present	20 to 21	16 to 19	30 to 36	5 to 16
,,	Chappell (1940)	21 to 37	—	—	—
,,	Olliver (1941)	30 to 47	19 to 23	—	—
Parsnip	Present	4 to 8	2 to 8	—	—
,,	Chappell (1940)	5 to 6	—	—	—
,,	Olliver (1941)	5 to 9	2 to 4	—	—
Orange*	Bacharach *et al.* (1934)	—	—	36 to 89	—
,,	Chappell (1940)	—	—	27 to 88	—
,,	Olliver (1936)	—	—	33 to 77	—
Black-currants	,, (1936)	172 to 220	141 to 183	—	96 to 122†
	,, (1938)	108 to 344	—	—	—

* Excluding Seville or other bitter oranges.
† Syrup from cooking; about 50% added water, and fruits not expressed.

Results

As a matter of interest we have summarized in the accompanying table the recent results obtained by Olliver and Chappell, as well as our own, along with some figures for orange juice and blackcurrants. All our determinations were made by titration with 2:6-dichlorophenol-indophenol in the presence of trichloracetic acid.

Parsnips appear to be of no more use than carrots as sources of ascorbic acid. On the other hand, turnip juice or swede juice, cold-pressed, before or after boiling, or the liquors from squeezing the lightly boiled roots, should be of value, especially in infant feeding. Taking the daily requirements of an infant as 5 to 10 mg., then from 1 to 2 fl. oz. of turnip juice or 1/2 to 1 fl. oz. of swede juice each day would suffice. Either of these juices, since they are only slightly acid, can be used to replace the boiled water of a milk feed without causing any curdling, though it imparts to the product a distinct taste and odour of the vegetable, that from the swede also contributing a little colouring matter.

REFERENCES

Bacharach, A. L., Cook, P. M., and Smith, E. L. (1934). *Biochem. J.*, **28**, 1038.
Chappell, G. (1940). *J. Hyg.*, Camb., **40**, 699.
Fixsen, M. A. B., and Roscoe, M. H. (1938). *Nutr. Abstr. Rev.*, **7**, 823.
—— —— (1940). Ibid., **9**, 795.
Olliver, M. (1936). *J. Soc. chem. Ind.*, **55**, 153T.
—— (1938). *Analyst*, **63**, 2.
—— (1940). *Lancet*, **2**, 190.
—— (1941). *J. Soc. chem. Ind.* (in the press).

Medical Memoranda

100 Cases of Scabies: A Comparison of Treatments

To investigate the relative efficiency, speed, cost, and convenience of the various treatments of scabies recently discussed in the *British Medical Journal* I have treated men suffering from this complaint by five different methods:

1. *Sulphur Ointment.*—Sulphur ointment 10% is applied after a hot bath and a scrub in the morning; another application of the ointment is made in the evening.

2. *Sulphur Ointment and Confection of Sulphur.*—The same as the above, except confectio sulphuris 1 drachm is given once daily (Berncastle, 1941).

3. *Benzyl Benzoate.*—Anoint the body with soft soap. Soak in a hot bath, rubbing the affected areas thoroughly. While the body is still wet apply a lotion consisting of equal parts of benzyl benzoate, industrial spirit, and soft soap (King, 1940) vigorously all over with a nail-brush for five minutes. Allow it to dry, then apply the lotion again for a further five minutes. Dry with a towel.

4. *Rotenone.*—A hot bath is taken and the patient is painted all over with 1% rotenone B.D.H. or 2% rotenone (sarevan) Evans in front of a fire (Caller, 1941).

5. *Derris Root.*—The patient is painted thrice daily with a solution consisting of 4 oz. of derris dusting powder, 18 drachms of soap flakes, and 1 gallon of cold water (Saunders, 1941).

There was no selection of cases apart from the exclusion of those in which the diagnosis was in doubt. Each case was treated by one method only until cured.

The diagnosis was founded on the association of itching when warm with the presence of burrows, which are most profuse in certain areas and there give rise to a red papular rash. A patient was considered cured when the itching had ceased, when there was no sign of activity of the rash (redness, swelling, etc., around the burrows), and when the rash had ceased to spread. It is probable that in this series about five days were wasted by hysterical or wilful "prolongation."

RESULTS AND COST

The time taken to cure 20 cases was: method 1, 46 days; method 2, 59 days; method 3, 30 days; method 4, 38 days; and method 5, 41 days. I account for the fact that the 20 cases

treated by sulphur ointment took only 46 days as being due to the large number of mild cases in that group.

In assessing the cost, the expense of disinfecting the clothes and blankets is ignored because it varies so much from place to place. The cost of the soft soap for bathing purposes and the soap flakes is also ignored, it being very small. On this basis I calculated that the cost of curing a case by the five methods was: (1) 4.44d.; (2) 6.79d.; (3) 11.25d.; (4) 24d.; (5) 0.25d.

CONCLUSIONS

Benzyl benzoate is the most rapid of the five methods tried. It is clean, but dermatitis results in some cases. Moreover, it is fairly expensive and, at the present time, is difficult to procure.

Diarrhoea is the only appreciable difference that confection of sulphur makes to a man already being treated with sulphur ointment. It has no effect on the time taken to cure him. Sulphur can be counted on to cure the average case in three days. It is reliable and cheap, and only rarely causes dermatitis. The drawback is that it is such a dirty method.

The rotenone preparations, which cure an average case in two days, are clean and convenient but very expensive. In three cases there developed dermatitis of the scrotum following treatment with rotenone; one of these also developed balanitis.

The derris root method is most satisfactory. It is extraordinarily cheap. It is also clean and efficient. There is no necessity for the patient to bathe or to disinfect the clothing he is wearing. I had no case of dermatitis following the use of derris root.

My thanks are due to S.B.P.O. Mellish and Surgeon Captain I. McA. Holmes.

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REFERENCES

Berncastle, H. M. (1941). *British Medical Journal*, **1**, 135.
Caller, S. (1941). Ibid., **1**, 457.
King, R. E. (1940). Ibid., **2**, 626.
Saunders, L. (1941). Ibid., **1**, 624.

Convulsions under Anaesthesia

Reports of the occurrence of so-called "ether convulsions" have become very frequent in the last few years, and one of the most anomalous features of this puzzling phenomenon is the apparent fact that, whereas a few anaesthetists or surgeons are able to recount a series of cases, the majority of anaesthetists have yet to meet their first case. The following describes my first experience of this alarming condition in fifteen years of anaesthetic practice, and I hope it will be my last.

CASE REPORT

The patient, an otherwise normal female child aged 10, underwent Steindler's operation upon both feet on June 11 last. Anaesthesia, administered by myself, was smooth and uneventful. The child received premedication with omnopon 1/6 grain and scopolamine 1/300 grain one and a half hours before operation; induction was with nitrous oxide and oxygen, and after "blind" intubation anaesthesia was maintained with vinesthene 25% in ether in closed circuit, using a circle absorber. The child had been anaesthetized previously, at the age of 5, for tonsillectomy, the anaesthetic on that occasion being ethyl chloride followed by open ether. This anaesthesia is reported to have been without incident.

The temperature upon the evening preceding the Steindler operation was 99°; upon the day of operation it was normal. There was intermittent fever, rising to 100°, for two days after the operation; but this subsided, and for the succeeding four days the temperature was normal. On the seventh day pyrexia returned, accompanied by complaint of pain in the right foot. Pyrexia was intermittent, but since the pain persisted it was decided to change the plasters, and on June 25 I was asked to anaesthetize the child for this purpose. The evening temperature on the 24th was 101°, but on the morning of the 25th it was 98.4°. The child was not obviously ill or toxic.

Premedication was again with omnopon 1/6 grain and scopolamine 1/300 grain. Induction with nitrous oxide and oxygen was smooth, and was followed by maintenance with vinesthene 25% in ether in closed circuit with circle absorber. Intubation was omitted, since upon this occasion the prone position was not required. The day was hot and sultry, the theatre temperature, in spite of all available ventilation, being 82°. Within the first fifteen minutes of maintenance the respirations became more vigorous than normal, and it was found that the soda-lime in the absorber had become exhausted; this was therefore renewed. Respiration, however, continued to be unsatisfactory, resolving itself into a series of sudden diaphragmatic contractions resembling hiccup, unwarranted by the plane of anaesthesia (lower first plane), with accompanying slight cyanosis. Rhythmical distension of the lungs by gentle bag compression improved the colour and temporarily allayed the diaphragmatic spasms, but these returned, and were shortly followed by generalized convulsions, with twitching of the facial muscles and intense cyanosis. The nature of the condition now being apparent, I withdrew the anaesthetic, raised the head by placing the table in reverse Trendelenburg, instituted lung inflation with oxygen, and ordered some 10% evipan solution to be prepared and a rectal temperature to be taken. The rectal temperature, taken under great difficulty, was recorded as 103°; the child, however, was extremely hot to the touch, with a dry skin. No improvement in the condition being apparent, I decided to give the evipan. Venepuncture proved to be impossible owing to the absence of visible or palpable veins, and since the condition of the child now appeared to be desperate I gave 4 c.cm. of the evipan intramuscularly into the triceps. The patient was now grey-black, with pupils widely dilated and arrested respiration. I rapidly exposed the larynx, passed an intratracheal catheter, and began insufflation with oxygen. This measure quickly restored the colour. No further convulsions occurred, and the operation, which had revealed a septic condition of the wound of the right foot, was completed, and the legs were re-encased in plaster without additional anaesthetic. No further trouble occurred, and the child left the theatre with normal respirations. Next day she was quite well.

COMMENTARY

Of the usually cited causative factors the following were present in this case: sepsis and possibly some toxaemia; an abnormally hot theatre and sultry weather; raised CO_2 tension for about fifteen minutes, due to exhausted soda-lime; a patient partially covered with mackintosh sheets; the administration of ether. The following factors were absent: the pre-operative administration of atropine; suboxygenation; marked toxaemia.

While the comparative rarity of the occurrence of convulsions under anaesthesia would seem to postulate the need for some subtle and rare combination of factors in their production, it is clear from the cases reported that only two of the factors cited are constantly present—sepsis with toxaemia, and anaesthesia in some form. Of these two factors, since cases have been reported as having occurred under both local and general anaesthesia, which differ widely in the physiology of their actions, it would seem that sepsis with toxaemia is the more constant and must therefore be accorded pride of place in causation; while anaesthesia must be relegated to the role of precipitating factor, possibly through a modification of the stimulus threshold of the nervous system. This would seem to support strongly the postulated neurotoxic origin of the condition.

I have complete confidence in the advisability of administering evipan in this condition, whatever the state of the patient; and from the rapidity and efficacy of its action in this case it would seem that the intramuscular route is as effective as any other, and, if one may dogmatize after such brief experience, I would advise the adoption of this route, since it would seem to be safer in a moribund patient and to afford a longer period of less depressive sedation. As an alternative technique I would suggest a minimal effective dose intravenously, followed after a short interval by the formation of an intramuscular "depot."

CONCLUSIONS

Of all the possible causative factors so far cited only two are constantly present in every case.

Although the convulsions do not necessarily start in the facial muscles, as has been so often stated, there is not the slightest difficulty in recognizing the condition once it has arisen.

Successful treatment consists in the immediate withdrawal of the anaesthetic, the early administration of evipan, intra-