oblems of the community in e as judged by the 1981 intake gems

		Relative weight ●	
	:nce/lack of health	16.9	16.9
	taboos	16.8	33.7
(3)	Lack of water supply	11.9	45.6
(4)	Poverty	10.4	55.9
(5)	Infections and other diseases	9.8	65.7
(6)	Poor sanitation	7.5	73.3
(7)	Shortage of drugs	7.3	80.6
(8)	Poor nutrition	7.0	87.6
(9)	Climate (droughts, heavy rain)	3.4	91.0
(10)	Poor family planning	3.2	94.2
(11)	Poor housing	1.7	95.9
(12)	Alcoholism	1.5	97.4
(13)	Improper treatment	1.3	98.7
(14)	Religion	0.9	99.6
(15)	Poor cooperation between staff and public	0.4	100.0

● Expressed as percentages of the total allocated to all 15 items. The last column shows the cumulative percentage weights

involvement that were not yet explicit in the days of "basic health services". However, the WHO report "Primary Health Care" (1978) still includes "Further extension of basic health services".

The economic prospects do not support the expectation that health services in the poor countries will be able to support this further extension with materials or supervision.

All emphasis should, therefore be given to the community development dimension of the primary health care approach whereby health objectives should be included in rural development plans. Ministries concerned with development and education are probably better equipped to achieve "Health for all by the year 2000" than is the "health pyramid", which is already stretched to the limit.

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Coagulant property of an indigenous seed:

Home water treatment in Tamil Nadu

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INTRODUCTION

It has been observed in the rural areas of Tamil Nadu that the village people use the seeds from the tree called in Tamil *tettan cottai* to purify water. This practice has been handed down through the centuries, simply because it works. The people take the seed, which when dried looks like a slightly flattened sphere about 15 mm in diameter, and carefully rub it on the inner surface of earthen vessels in which water is stored. The water is allowed to stand overnight and in the morning the supernatant fluid is clear. It has even been claimed that the supernatant is free of bacteria.

The use of vegetable substances to purify water has been recorded in ancient literature. Baker (1949) mentions in his historical account of the quest for pure water the use of the seed of *Strychnos potatorum* by the Aryan and Indic priests and physicians as far back as 400 AD to purify water. *Strychnos potatorum* is a small to middle-sized deciduous tree commonly called the "clearing nut tree". It is common in many parts of the dry deciduous forests of the Indian subcontinent. In Hindi it is called *nirmali* and in Tamil it is *tettan cottai*. The seed of the tree grows to about 0.4 to 0.5 cm in diameter and has a whitish pulp. Troup (1921) wrote that "the seeds are used to clear muddy water by rubbing the inside of vessels with them". The seeds being used today in Tamil Nadu have indeed been identified as the seeds of this tree.

It was reasoned that to attain the results the seed must have coagulant properties. A special study was therefore conducted.

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METHODS

Since the villagers rub the seeds on the rough inner surfaces of earthen vessels, it was thought that the surface coating of the seeds was the material to be tested. Two methods were tried to obtain the outer layer of the seeds: first, by scraping with a metal file; secondly, by putting them into a Waring blender. With the file a light, fluffy material was obtained. This was, however, a laborious and time-consuming task. The fear that the Waring blender might crush the seeds was unfounded; in fact, in the blender the outer layer was very finely scraped off, producing a more uniform material.

Since a limited number of the seeds was available, the test involved coagulation-flocculation of laboratory-prepared turbid water. The test water was made using a suspension of bentonite clay in tap water. A test run involved 6 samples of 500 ml of turbid water in glass beakers. To five of these beakers carefully measured quantities of the seed scrapings were added. The sixth beaker was the control. Contents of all six beakers were stirred vigorously for approximately one minute after dosing. This was followed by slow stirring with the mechanical stirrer for two to three minutes. After precipitates had settled the supernatant fluid was filtered and turbidity determinations were made on the filtrate in a Hach Turbidimeter, Model 2100A.

RESULTS

When the seed scrapings were added and stirred into the water, floc formation was readily observed with the naked eye. The sedimentation of the particles was, as expected, a slow process.

Two experimental runs showed that the material from the seeds did contribute to turbidity reduction. Two temperatures (20°C and 30°C) were tested in the earlier experimental run, and the results are given in Table 1. In a subsequent run the test was repeated at 20°C, with a settling time of 15 minutes (Table 2).

Check on alkalinity and pH before and after the addition of the seed scrapings showed no appreciable change. Alkalinity was in the region of 53 mg/litre as $CaCO_3$, and pH was 7.2–7.4.

DISCUSSION

The tests established that the material of seeds of *tettan cottai* has a coagulant property which appears to be the mechanism involved in the clarification of water in the Tamil Nadu villages of South India. Water temperature in many parts of South India is higher than the temperature at which the tests were carried out in the environmental health engineering laboratory in Baltimore, Maryland (USA). Increased temperature was seen to enhance coagulation. This can be seen when Table 1 and 2 are compared. There appears to be also an optimum dose rate. Turbidity reduction falls above and below the optimum dose rate, much as with the use of alum in municipal water treatment process (Shull 1967). This is suggested by the results shown in Table 1.

Short settling times were employed in the tests on purpose, as the villagers may not wait long to use the water. If in fact they wait overnight for water to clarify, greater turbidity reduction is to be expected. We do not know whether, in the drawing of the water out of the earthen pot by whatever manner, the settled floc might be resuspended.

Table 1. Turbidity reduction using scrapings of seeds of *Strychnos potatorum*

	Turbidity (NTU)	
Dose (mg/l)	*20°C, 60 min settling*	*30°C, 15 min settling*
Control	4.5	4.5
20		1.25
40		1.1
50		1.5
100	1.3	
150	2.4	

NTU = nephelometric turbidity units

Table 2. Turbidity reduction using scrapings of seeds of *Strychnos potatorum*

Dose (mg/l)	*Turbidity (NTU) 20°C, 15 min settling*
Control	4.0
2	3.7
4	3.4
10	2.9
15	2.75
20	2.9
30	2.5
40	2.5
50	2.25
70	2.25

NTU = nephelometric turbidity units

SUMMARY

Use of some vegetable substances as coagulant has been recorded in historical literature. A seed from the tree known as *tettan cottai* is used today in South Indian villages to purify water. The scrapings of the seed were shown in laboratory experiments to have coagulant properties. It would be extremely valuable to have additional measurements made in South India, where the practice is employed in removal of turbidity, and also to have evidence of the extent of removal of microorganisms.

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Book Reviews

Atlas of Surgical Operations

by Robert M Zollinger and Robert M Zollinger jr *(1983 5th edition pp 437 £72 Collier Macmillan, London &c.)*

This is a large atlas from the United States, first produced in 1939, which has now appeared in its fifth edition. It is profusely illustrated by fine line drawings containing very clear detail. It is aimed at the experienced trainee surgeon, and its major sections are on abdominal procedures, vascular surgery, gynaecological operations, and "miscellaneous procedures" which include the rest of surgery: surgery of the head, neck, and of the breast, hernia surgery, anorectal surgery, amputations, nerve and tendon suture, the drainage of sepsis of the hand, and skin grafting. It does not include any discussion of urological or orthopaedic surgery, so there is no description of prostatectomy nor of operations on urethral stricture, osteomyelitis, etc. This limits its usefulness for the surgeon in tropical areas, who is so often called upon to ply his craft in a very wide field of what was formerly called "general surgery".

The book shows signs of its age in many ways. Thus in the opening chapter, layered closure is recommended without any discussion of the now popular methods of mass closure in just one or two layers. Nevertheless there is healthy emphasis upon careful handling of the tissues and of meticulous technique at all stages in the operation.

The section on anaethesia is not particularly relevant to the tropics. The EMO and similar draw-over vaporizers are not mentioned, and nor is ketamine. Procaine is recommended as the local anaesthetic of choice – whereas it has been almost entirely superseded by newer and safer drugs.

The third chapter is disappointing in that it uses ponderous phrases and generalities where a few succinct sentences might have been more helpful. A statement such as: "The potential dangers of dehydration and starvation were not understood; nor were tests available to determine the levels of the normal constituents of blood serum" may not be as helpful as more concrete advice: "Avoid hypoglycaemia due to overlong preoperative starvation. In children this can cause brain damage". It is difficult to be sure for whom this chapter has been written. Once again, some of the advice seems antique: is the Miller Abbott tube still widely used? There is, however, a very useful table for intravenous replacement of fluid losses.

The chapter on surgical anatomy is confined to intra-abdominal anatomy only, reflecting no doubt the interests of the authors.

As far as the rest of the book is concerned, I have nothing but praise for the excellence of the illustrations. One is tempted to feel that the book's main usefulness might (apart from the problem of copyright) be for the hard-pressed teacher needing help in producing illustrations. There are, however, weaknesses in the text – largely reflecting the age of the book. Thus, not all surgeons would agree with the wide recommendation for the use of (expensive) interrupted silk sutures in anastomosis; nor would gastrostomy be widely welcomed as a "palliative" method in oesophageal obstruction. Many surgeons would prefer a diagram of proper skin-to-mucosa suture in transverse colostomy to one of a knuckle of bowel with a hole made in it and a tube fed into that.

The section on femoral hernia is poor, and in discussing hernia operations, no mention is made of what to do if bladder appears in the hernia and is inadvertently injured. Again, many surgeons would like umbilical hernia to be distinguished from para-umbilical hernia, which is quite different.

A large section is devoted to vascular procedures, but there is no mention of the common emergencies (stab wounds over vessels and their dangers); only what seems to be undue emphasis on more rarely required operations (mesenterico-caval anastomosis and the like).

The section on rectal surgery seemed very antiquated, with no reference to modern operations such as those of Parks for fistula-in-ano, of Lord for haemorrhoids, nor of the Ivalon sponge repair in rectal prolapse.

In the section on the spleen I looked for detail on methods of repair and partial resection in injury cases, but sadly the detail here was inadequate.

In short, this seems to be a book whose main value may lie in its excellent illustrations of abdominal, vascular, gynaecological, head and neck, and breast surgery; but its great cost and limited field probably make it an inappropriate "buy" for the average tropical surgeon.

PETER BEWES