

Common colds on Tristan da Cunha

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SUMMARY

Eight epidemics of respiratory disease have been observed among islanders of Tristan da Cunha. They seem to be initiated by the arrival of ships and transmission seemed to occur as a result of close human contact but could not always be traced. Islanders suffered from less colds than those in less isolated communities.

INTRODUCTION

For many years it has been known that there were some unusual features of the epidemiology of common colds on the island of Tristan da Cunha in the South Atlantic. Epidemics were said to occur which affected many of the islanders, but they only took place when ships called at the island from Cape Town and not from more distant parts (Woolley, 1963). Similar epidemics have been noticed on Easter Island (Heyerdahl, 1958). However, systematic prospective studies had never been made in such a situation.

Tristan da Cunha was evacuated in 1961 because of the eruption of the volcano and the islanders came to Britain, where, after an initial period of unusually frequent and unpleasant respiratory tract infections, the frequency and clinical pattern of illness seemed to be much like that of other inhabitants (Black, Thacker & Lewis, 1963; Samuels, 1963). It was therefore of interest to find out whether the pattern of epidemics observed before the evacuation would be re-established when the islanders returned to Tristan da Cunha and also to document, as far as possible, the occurrence of such epidemics which previously had been based only on impressions and hearsay evidence. For 5 years after the main party returned continuous records of respiratory infections were kept, apart from one short break, and this paper presents a qualitative analysis of these.

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THE POPULATION AND MIGRATIONS

The evacuation and repopulation are shown graphically in Fig. 1. The island was re-occupied as follows:

- 1962: Scientists of a Royal Society expedition took an advance party of 12 men. When the volcanic activity subsided, 12 islanders returned to the island in January, in company with scientists of a Royal Society expedition.
- 1963: In May, 52 islanders returned, followed by 198 in November; this left only 14 islanders in Britain.
- 1966: In April, there was a voluntary migration from Tristan by 37 islanders, who came back to Britain.
- 1967: In October, 9 of this group decided to return once again to Tristan.
- 1968: In August, they were followed by another 6.

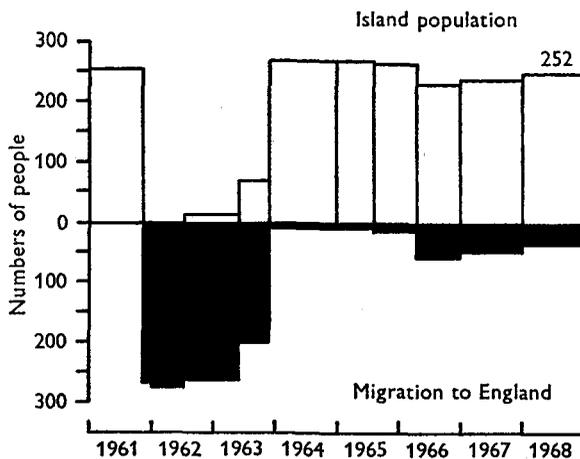


Fig. 1. The movement of islanders to England following the volcanic activity of October 1961, and the relatively stable population of the island following the return of the main party in 1964.

During the period of this study the traditional pattern of life on the island had been re-established and was maintained. Islanders lived in 71 houses, grouped as shown in Fig. 2. The number in each house varied from 1 to 8, the modal number being 3. Their children between the ages of 5 and 15 years attended the school, in which they were divided into 4 classes by age. There is a canteen which the adults visited almost every evening. The men worked outside much of the day but women met together indoors in fairly well-defined 'carding parties' for work and social intercourse. There were usually 40–50 islanders at the church service on Sunday and there were occasional parties at which virtually the whole population gathered under one roof. Apart from this there were a great many casual contacts between neighbours, both indoors and outdoors, though these tended to be more frequent among those who were closely related. Hence, the internal contacts did not differ much from those of well-knit village communities in all parts of the world; however, contacts with the outside world were infrequent. As shown in Fig. 3, ships

called only occasionally. The most important of such visitors were the fishing vessels *Gillian Gaggins* and *Tristania*. These worked in Tristan waters twice a year, namely between September and December and between January and March, when about a dozen islanders joined the crew. The ships took their catches to Cape Town where they spent about a month, the voyage taking about 6 days. These ships, as a courtesy, took occasional passengers to or from the island.

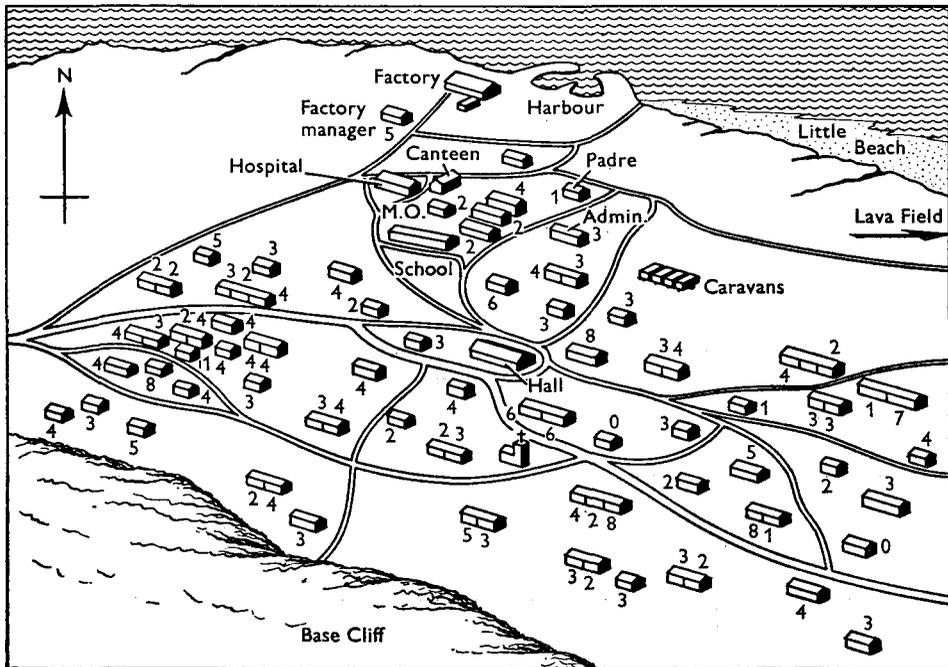


Fig. 2. The housing of the community in 1968. The layout of the village is shown and the digit alongside each building shows the number of people living in each house or part of a house.

In addition to the islanders there were a few expatriate employees on the island. These were the administrator, padre, radio operator, public works department operator, school teacher, doctor and factory manager, and each was accompanied by his family. All had frequent contact with the islanders.

Collection of information

The island medical officers were in continuous residence, S.G. from May 1963 to May 1965 and M.S. from May 1965 to June 1968. They kept ordinary clinical records of patients who consulted them and, in addition, they used the opportunity of their frequent contacts with the islanders to detect as far as possible all members of the community who developed minor upper respiratory infections. Each patient, as recognized, was given a simple diary record card, based on that of Hope-Simpson (see Tyrrell, 1965), which he completed for the period of the illness; other members of the patient's family were given cards also, and completed them if they

became ill. It was not possible to make a complete check of the population, but most of them were thoroughly cooperative and completed cards, although they needed a little assistance at times. It is likely, however, that there was some under-reporting, which may, of course, have varied in amount, being less when the type of illness was more severe and therefore more likely to require medical attention. Apart from this weakness the records seem to be quite adequate for our purposes.

Shipping movements were supplied from the records of the offices of the companies and the administrator of the island.

DESCRIPTION OF THE EPIDEMICS

The epidemics have been summarized in Fig. 3 which shows the general pattern of discrete outbreaks which were reported by previous visitors to the island. Two epidemics were incompletely recorded and are so indicated. The outbreaks tended to occur after the arrival of ships, as shown in Fig. 3, and usually followed the arrival of ships coming directly from Cape Town, rather than those which had been

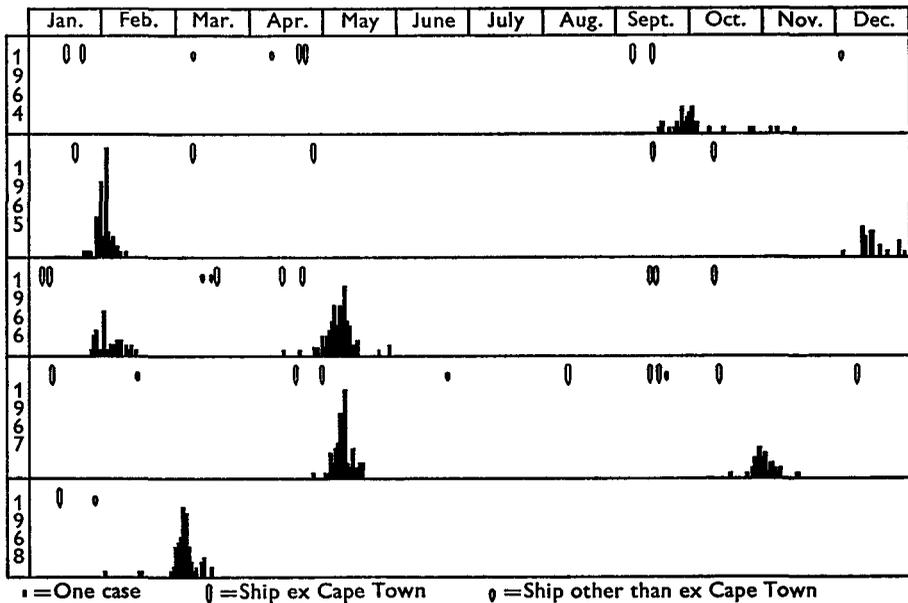


Fig. 3. The occurrence of epidemics of respiratory disease. The arrival of ships from Cape Town is also shown. Almost all colds occurred in definite epidemic waves. Between these waves there were a few sporadic cases, although some of these seemed to be 'leading up' to an epidemic. Epidemics in 1964 and December 1966 were incompletely recorded.

at sea for long periods. We would like to have known whether there were any characteristic circumstances which led to the initiation of an epidemic, but were hampered by lack of information about the occurrence of colds on the ships and the exact details of the coming and going of members of ships' companies and the islanders.

On some occasions the circumstances were obvious; for example, in April 1967 B.L. was returning from Cape Town and developed a cold 2 days before coming ashore. When he got home he passed it on to his family, whence it spread to the community. On the other hand, in October 1967 D.R., a young woman who was not known to visit the ship and who worked in the hospital, was apparently the first case after the arrival of the ship 3 days before. No further case was detected until several days later, when another young woman who probably had no close or direct contact with her developed a cold. Another gap occurred and then an epidemic developed quite rapidly (see Fig. 3).

Relationship between epidemics on board ships and on Tristan da Cunha

Three ships called regularly at Tristan and each made trips twice yearly. Two were small boats which fish for rock lobsters in shallow Tristan waters. These ships brought limited food and emergency supplies for the island, which were off-loaded

Table 1. *Clinical features of successive epidemics*

	Jan–Feb. 1966	April–May 1966	April–May 1967	Oct–Nov 1967	Feb–March 1968	All epidemics
Total number	41	104	96	41	68	350
Percentage of total with:						
Nose blocked	88	64	42	49	37	—
Nose running	97	75	75	85	88	—
Throat sore	83	52	45	44	53	—
Cough	85	58	35	56	63	—
Tight chest	51	23	17	24	22	—
Feeling tired	66	28	14	12	12	—
Headache	71	47	19	32	22	—
Median duration (days)	6	6	4	4	5	—

before fishing. The MV. *RSA* brought the main supplies for the island store and passengers arriving about the end of April and the middle of October from Cape Town. The *RSA* stayed in Tristan waters for from 1 to 2 weeks, but might have had to wait longer if the sea was rough. The passengers who arrive from Cape Town on the *RSA* are often the source of common cold infections on the island. In May 1965, however, the *RSA* called at Gough Island first and did not arrive at Tristan until 3½ weeks later and, on that occasion, no common cold epidemic occurred. It is possible that any virus on board had died out during the 3–4 weeks' journey. The fishing ships, on the other hand, made a more intimate contact with the islanders, in the sense that some islanders were employed to work on board the ships throughout a fishing season.

The first fishing season each year started in the middle of January and continued until the middle of March. The second season started in September and finished in the middle of December. Before starting any fishing, about 20 dinghies were collected from the settlement. The two ships usually arrived almost together, but if the sea was rough they waited in the lee of the island for a couple of days. The fishing boats usually worked round Nightingale and Inaccessible Islands which

are small and uninhabited and situated about 40 km. S.W. of Tristan: they also made a fishing trip to Gough Island, 350 km. S.S.E., but they called at the settlement 3 to 4 times for supplies of fresh water and on these occasions the islanders on board visited their families.

These mid-season visits may have been very important in spreading common colds. The islanders worked on board the ships in intimate contact with the Cape Town crew and if there was a common cold epidemic on board the ship, the islanders usually suffered from the infection. For example, in 1965 the *Gillian Gaggins* was newly commissioned and made her maiden voyage to Tristan. About 20 islanders were employed on that occasion to help with fishing, but after a week the refrigerator broke down and she had to go to Cape Town for repairs. Almost half the islanders who came ashore had colds and this initiated the late 1965 epidemic. However, on another occasion, one of the ships did not call at the settlement during the season and instead collected water supplies from Gough Island. Towards the end of the season when the islanders came home finally they admitted to having suffered from common colds in the first 2 weeks of fishing, and this infection was passed on to the members of the meteorological team stationed at Gough. Nevertheless, when the ship called at the settlement about 8 weeks after leaving no epidemic resulted.

In addition to the *Gillian Gaggins*, the *Tristania* and the *RSA*, other ships call at the island from time to time. These include ships of the Royal Navy, passing tourist liners, Norwegian whaling ships and sometimes oil tankers. These can only make contact with the island when the sea is calm and boats can enter the harbour safely. Occasionally, a ship with a serious medical emergency on board may call at the settlement if it is considered risky to head for the destination or the nearest mainland port. Cold epidemics are practically never initiated by such contacts.

Comparison of the epidemics

The only epidemics which occurred on the island were the epidemics of respiratory diseases shown in Fig. 3. Nevertheless, these varied from each other in a number of ways. A summary of the symptoms reported in five epidemics is given as Table 1. The number of cases which we recorded ranged from 41 to 104 – from about one-fifth to one-half of the islanders. The epidemics also varied in duration, some being over quickly, while others lingered on (Fig. 3). The first epidemic, though small, was associated with much sore throat, cough, headache and malaise as well as coryza. In all epidemics, nasal discharge was the most frequent symptom, followed by cough, sore throat and nasal obstruction. In the 1966 epidemics, the illness lasted longer as well as being accompanied by more constitutional upset. In the two epidemics that were incompletely recorded, sore throat was a prominent symptom.

During epidemics, a number of patients with mild asthma or chronic bronchitis attended the hospital because their symptoms had worsened and a number of these had recently suffered from common colds.

It can, therefore, be concluded that the eight epidemics observed between 1963 and 1968 were fairly uniform in clinical pattern, varying a little in severity and in

the prevalence of sore throat. Since less than half the population was involved in any one epidemic, it is clear that on the average the islanders were suffering from less than one cold a year, substantially less than the inhabitants of less isolated rural or urban communities.

The records of each illness showed the presence or absence of each symptom on each day. It was therefore possible to arrange the information so as to show how many subjects on each day were showing symptoms of a cold. These figures are being used in studies by B. E. Hammond (in preparation).

DISCUSSION

We feel that the study of this isolated community has been of value in obtaining fairly clear evidence that acute respiratory disease in a very isolated small community behaves as an infectious disease introduced from outside. It appears also that it is usually introduced when there is fairly close contact indoors between patients and normal subjects. There was suggestive evidence that these presumably viral infections precipitated attacks of asthma in susceptible subjects from time to time.

The epidemics resemble that reported by Paul & Freese (1933) in Spitzbergen, where the infection was introduced in spring when the first ship arrived.

On the whole there is also agreement between our observations and those made on small groups of Antarctic explorers, in whom epidemics are introduced from outside although there have also been reports of epidemics arising within these groups, possibly as a result of unpacking clothes (T. R. Allen, personal communication), months after contact with the outside world was broken. Such epidemics are uncommon, however, and possible causative viruses of colds in Antarctic explorers have still not been isolated in spite of serological and other studies (Cameron & Moore, 1968).

We would now like to have further information about the causation of epidemics. Sera collected before the evacuation contained antibodies against parainfluenza viruses, two rhinoviruses and respiratory syncytial virus (Taylor-Robinson & Tyrrell, 1963; J. E. Acornley, personal communication). There was also evidence that they had been infected with influenza viruses (Tyrrell, Peto & King, 1967), although it is unlikely that such a virus caused the epidemics seen in the period of this study. On leaving Britain to return to the island they had more circulating antibody against influenza and parainfluenza than when they were evacuated (Tyrrell *et al.* 1967), nevertheless, it was not long before viruses were being introduced and causing epidemics in the population.

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