of blood in the lumen. Diagnosis: acute encephalitis with consequent haemorrhage into subdural space and into lateral ventricles. Microscopical examination confirmed the diagnosis of acute encephalitis.

Case No. 8.—Well-developed child without congenital abnormalities. Clear dark straw-coloured fluid in pleural cavities and pericardium. Much oedema and many petechial haemorrhages in scalp over vertex and occiput. Pial vessels congested and many petechial haemorrhages in brain substance, including cerebellum. Petechial haemorrhages below visceral pleura on each side and one below visceral pericardium. Several considerable haemorrhages into substance of each kidney. Congestion of lungs, especially bases, and of liver and spleen. Diagnosis: acute septicaemia.

Case No. 9.—Small child, born after 7½ months' pregnancy of mother with a positive blood Wassermann. Considerable haemorrhage into pericardium and into peritoneum. Patches of intense pulmonary congestion into which quite massive haemorrhages had occurred. Liver and spleen almost black from congestion but of average size. Congestion of kidneys, bladder, alimentary tract, and adrenal glands. Considerable oedema of scalp. Leptomeninges and brain intensely congested and some haemorrhage into leptomeninges. Microscopical examination: Brain—vessels congested but no cellular infiltration of perivascular sheaths; occasional small haemorrhages. Liver—blood sinusoids greatly congested. Lungs—in portions examined, alveoli and small bronchi filled with blood.

Summary

The notifiable diarrhoeal diseases have occasions of increased prevalence but "residual" average dimensions. Non-specific diarrhoea results in considerable relatively constant annual mortality, mainly among infants. Specific diarrhoea cases and enteritis deaths are usually highest in the third quarter. Enteritis deaths are regularly frequent also in the fourth quarter. In a Glasgow series of enteritis deaths nearly nine-tenths of the homes were small and four-fifths were overcrowded. The aetiological significance of these seasonal and environmental factors is discussed. Reference is also made to the advantage of segregating hospital cases of non-specific gastro-enteritis and to the practical implications of the recognized frequency of association in infants between enteritis and otitis.

In a winter outbreak of neonatal infections in a Glasgow institution 7 of 9 cases ended fatally after an afebrile illness characterized by rhinitis at onset, loss of weight, and terminal enteritis. The bacteriological findings in the noses or throats of cases and infant and adult contacts are reported. Four cases went to necropsy, and infection was ascribed to an unidentified virus. Abstracts of the pathologist's reports are given.

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O. M. Stout and R. J. Kositchek (*Arch. Derm. Syph.*, 1940, 42, 803) report their observations on fifty-eight patients in whom pruritus was an outstanding symptom and who were treated at first with subcutaneous and later intravenous injections of 50 c.cm. of a 50% solution of dextrose. They found that the injections were of value in treatment of serum sickness, of temporary but often prolonged value in certain kinds of pruritus, and useless for pruritus in dermatitis venenata, senile pruritus, and infectious eczematoid dermatitis.

THE PROPHYLAXIS OF THROAT INFECTION

BY

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At this time of the year there is always a sharp rise in the incidence of infections of the upper respiratory tract. This winter the conditions of overcrowding and poor ventilation which prevail in public air-raid shelters will undoubtedly prove to be another important factor in the aetiology of these diseases. Various remedies to solve the shelter problem, such as the use of aerosols to diminish air-borne bacteria, are being investigated, but it is unlikely that these will be in operation before the winter is far advanced. In the meantime some simple method of prophylaxis which can be easily applied to large numbers of people is urgently required.

The Case for Nasopharyngeal Hygiene

The throat and nasopharynx form a natural reservoir and breeding ground for many varieties of pathogenic organisms, their dissemination into the atmosphere taking place by means of the buccal spray. A recent Ministry of Health memorandum (Straker, Hill, and Lovell, 1939) on the bacteria of the nasopharynx has shown that the carrier rate of throat-borne infections is astonishingly high, up to 20% of throat swabs yielding cultures of *Strept. haemolyticus* and 20 to 60% yielding pneumococci. *Haemophilus influenzae* showed a constant carrier rate in the nasopharynx of 60 to 65%. It has also been proved that during most of the large influenza epidemics of recent years the causal virus could be isolated from throat garglings.

Local treatment of the throat and nasopharynx has been regarded with a great deal of reserve since the last war, due largely to the conflicting results obtained in attempts to eliminate the meningococcus carrier. But in view of the pathogens which inhabit the throat in both health and disease there must still be a place in prophylaxis and therapeutics for one method of local treatment—the antiseptic throat spray. For whereas the limit of effective action of the gargle is somewhere between the pillars of the fauces, the throat spray, which projects droplets of fluid direct into the throat, brings the antiseptic into contact with the pharyngeal mucosa.

The following investigation was carried out in a large naval training establishment during the 1939-40 epidemic of influenzal nasopharyngo-tracheitis with the object of estimating the prophylactic value of the antiseptic throat spray. A solution of sodium hypochlorite (15 to 20%) was chosen as the antiseptic because it combines a powerful bactericidal action with a strong oxidizing and deodorant quality.

Procedure

Two groups each of fifty naval ratings were selected from those joining the establishment for the first time. Care was taken to ensure that these two groups should live under identical conditions in the same part of the establishment and that they should perform similar duties. From the day of joining the establishment one of these groups was subjected to a daily prophylactic routine, this being omitted in the case of the other group. The routine adopted was as follows: Each morning at 6.45, immediately after assembly, the group chosen for treatment was subjected to a throat spray of 15 to 20% sodium hypochlorite solution. The instrument used for producing the spray was a portable pressure atomizer. This consists of a hand-pressure pump fitted with a spray nozzle and

made of chromium-finished metal. During use pressure in the body of the instrument was raised by means of the hand pump, the spray being controlled by a stopcock at the base. The spray was projected direct into the throat and the fluid accumulating from this was enough for a final gargle. It was found that the treatment could be carried out on a class of fifty ratings in six to seven minutes. This routine was continued daily until the time of their departure from the establishment some five weeks after joining. During these weeks any rating of either class who reported to the medical department with any complaint whatever was seen by me and his condition noted.

	Untreated Group	Treated Group
Number admitted to hospital	13 (26%)	6 (12%)
Complaint	Acute sore throat, 11; common cold, 2	Cerebrospinal meningitis, 1*; acute sore throat, 3; common cold, 2
Number attending for daily treatment	23 (46%)	12 (24%)
Complaint	Sore throat, 18; common cold, 4; suppurative otitis media, 1	Sore throat, 6; common cold, 6

* This case of cerebrospinal meningitis developed on the second day after the entry of the rating to the establishment.

By "acute sore throat" is meant acute streptococcal tonsillitis and pharyngitis, together with marked constitutional symptoms so typical of the 1939-40 epidemic. By "sore throat" is meant a subacute infection of fauces and pharynx, and "common cold" indicates acute coryza with slight constitutional symptoms but little or no throat infection.

Conclusions

The results of this investigation, which are shown in the preceding table, demonstrate clearly that during the five weeks that these two groups remained under observation the incidence of sickness occurring in the treated group was greatly diminished. The total number of patients requiring to be admitted to hospital during this period, as well as those receiving ambulant treatment, was reduced by half in the treated as compared with the untreated group. This diminution was entirely due to the decreased incidence of acute and subacute throat infections, the incidence of "common cold" being more or less equal in both groups. Clinically it was observed that the acute throat infection occurring in members of the treated group was similar in severity and in duration of illness to that occurring in members of the untreated group. This suggests that the use of prophylactic treatment failed to attenuate the virulence of the infecting organisms in those cases in which they were not primarily destroyed.

The favourable results obtained in this small experiment indicate that the use of an antiseptic throat spray is a justifiable prophylactic measure against such common winter ailments as acute and subacute streptococcal throat infections and influenza.

Summary

The incidence of pathogenic organisms in the throat is briefly discussed and a method of destroying them by antiseptic throat spray is suggested.

A comparison is given of the incidence of infection in two groups each of fifty naval ratings during a period of five weeks, only one group receiving prophylactic treatment.

The prophylaxis consisted of a throat spray and gargle of 15 to 20% sodium hypochlorite solution each morning on rising for five weeks.

It is shown that the incidence of acute and subacute throat infection in the group receiving prophylactic treatment was greatly diminished.

The severity of the clinical condition once it has developed is unaffected by the previous prophylactic treatment.

I am indebted to Surgeon Captain J. Bruce Ronaldson, R.N.V.R., for his co-operation and to Sick Berth Attendant J. L. Patterson for his assistance. My thanks are also due to Mr. H. C. Edgell of Milton Proprietary, Ltd., for the supply of sodium hypochlorite solution and pressure atomizers.

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MECHANISM OF PARTIAL REBREATHING IN ANAESTHESIA

BY

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With modern apparatus for gas-and-oxygen anaesthesia rebreathing is always provided for by the use of a bag, and CO₂ is eliminated by absorption or by the use of an expiratory valve. The former method (absorption) will not be considered here. The latter, by which a portion of each expiration is retained and a portion released into the atmosphere, constitutes "partial rebreathing," and may be applied to continuous or to intermittent flow. In either case the ultimate justification for partial rebreathing lies in the fact that the non-alveolar upper air-passages add warmth and moisture to the gases they contain, but take no part in real ventilation, so that any procedure which conserves their contents while still permitting adequate ventilation at a lower level is rational and beneficial, the more so that increased lung expansion and oxygenation are thereby occasioned.

Some Important Factors

In examining the mechanism of this process, consideration must be given to the following factors: (1) the "spirometer gradient"; (2) the total minute-flow of the anaesthetic mixture; (3) the total minute ventilation of the respiration and its relation to the gas flow; (4) the metabolic needs of the patient.

The "spirometer gradient" depends on the fact that the CO₂ content of the expired air increases until about 800 c.cm. has been released, the content then reaching a maximal value, which is taken as representing the common concentration of CO₂ in the alveolar field. The actual form of this gradient is shown in Fig. 1, and is of import-

FIG. 1.—Showing the actual form of the "spirometer gradient." The horizontal co-ordinates represent depth of expiration in hundreds of c.c.m.

ance in the mechanism of rebreathing. It will of course vary slightly in different individuals or from time to time in the same individual. The curve here given is based on Haldane's figures.

The extent of rebreathing is determined by the relation between respiration and gas flow. Thus if respiration amounted to 12 litres per minute, and in the meantime