I suggest that the true explanation is that her father was a great burden to her, and subconsciously she must have desired his death, though, with characteristic overcompensation, she sat up every night during his illness. When he did die the fulfilment of her suppressed wish produced a sense of guilt lest she had in some way contributed to his death, and as a result she developed a guilty flush—i.e., rosacea. I explained all this to her and told her that she must live more for herself and move with her mother into a small easily run cottage; this, together with some local treatment, produced a dramatic improvement. It has been suggested that the emotional factor acts upon the face only indirectly through its influence on gastric tone, which has been shown to be related to rosacea (Eastwood, 1934). I do not think that it is necessary to introduce this complication when one remembers how directly flushing of the face is related to nervous influences; and, anyhow, the important thing is that all cases of rosacea should be considered from the psychological aspect.

That worry makes the hair fall out is a popular conception. I would go further and say that all cases of alopecia areata are nervous in origin and that all successes claimed for local treatment are due to suggestion or spontaneous improvement, though I admit that the actual speed of growth of hair is increased by hyperaemia. One could give endless instances of acute or chronic psychological factors causing alopecia, and there is a type of patient who reacts to adversity by losing his hair and is likely to do so repeatedly whenever things go against him. The following case, which was under the care of Dr. Ingram for several years, and which he has allowed me to quote, is a good illustration of the effect of nervous influences.

A. B., an only boy, suffered from alopecia totalis from about 7 years old. He was given a great variety of treatment at the General Infirmary at Leeds, including ultra-violet light, x rays, hormones, etc., without result. The parents, who lived in an isolated house, kept an anxious watch on the boy's scalp, but each morning failed to reveal any growth even to the closest scrutiny. Finally, after several years of treatment, Dr. Ingram insisted that the boy, who was now 14, should be sent away from home. After his first term at boarding school he returned home with a complete head of hair.

Another condition in which a sudden shock or a definite period of strain plays an obvious part is lichen planus. The onset of this disease is often dramatic; one patient of mine had a sudden attack of haematuria and developed lichen planus two days later, while another broke out the next day after answering the telephone and being told that her best friend had been killed. In these and similar cases the emotional factor is the trigger that sets the condition going, and the case is often rapidly cured; when, however, the rash develops after a period of worry or nervous strain, it may require considerable readjustment in the patient's mode of living before a cure can be effected.

Hyperidrosis; Warts

Hyperidrosis is a problem of some magnitude in the Army. The usual sufferer is of the active, highly strung type with tremor of his hands and feet—often a good soldier, but relegated to a low category because of his feet. The condition is almost incurable by ordinary means, though it can be controlled to some extent by foot toilet, sodium hexametaphosphate, etc. An indication of the real cause of the condition is given by the following patient of mine:

Cpl. X., a first-class soldier, but Category C because of severe hyperidrosis, had never had any trouble with his feet until 1940, when he was evacuated from Dunkirk. Since then he has had sweaty feet, which he attributed to wearing boots and marching continuously for five days. Examination showed his feet to be offensive, with the characteristic livid hue over the ball and outer side of the feet and heels, "honeycomb" maceration of the soles, and sodden skin between the toes (this latter is often wrongly diagnosed as ringworm). The hands are sweaty and tremulous.

The explanation is obvious: the experience at Dunkirk made him sweat and tremble with fear, and this emotion has persisted in his subconscious and is responsible for the persistence of his symptoms. Here is a real line of attack on this incapacitating condition, but in most cases it is by no means a simple psychological problem even for the trained psychiatrist.

One final condition might be of interest to the psychiatrist—the common wart. Warts are due to a virus, and can be transmitted from one person to another by injecting an emulsion of wart tissue. Despite this, Bruno Bloch maintained that he could cure 75% of warts by suggestion. My own experience confirms this possibility, and everyone will recall instances of warts being cured by methods which border on the magical. We have here apparently a remarkable instance of the course of an infection being modified by a psychological process, though I doubt if the psychiatrists would appreciate being sent all the patients with warts who crowd the skin clinics.

Conclusion

This paper is by no means exhaustive, but I hope it will indicate the importance of the psychological approach to dermatology and the close liaison there should be between the dermatologist and the psychiatrist. In the Army there is now ample provision of psychiatrists, and Army specialists of all kinds, having got accustomed to co-operating with them, will surely demand a similar service when they return to civil practice. Unfortunately exigencies of the Service tend to stress the diagnostic aspect. When we return to civil life we shall no longer be able to dispose of our difficult cases by boarding them to Category E, and it is among these that in the future I hope to see the psychiatrist playing a large part in dermatology.

REFERENCES

- Eastwood, S. (1934). *Proc. roy. Soc. Med.*, **27**, 1120.
Klaber, R., and Wittkower, E. (1939). *Brit. J. Derm. Syph.*, **51**, 501.
Rogerson, C. H. (1943). *British Medical Journal*, **1**, 406.

SICKNESS RECORDS OF NURSES IN A GENERAL HOSPITAL

BY

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The attention of hospital administrators in various countries has from time to time been directed to the health of nurses and to the protection of hospital personnel from the occupational hazards of their work. While considerable interest has been shown in the occurrence and prevention of tuberculosis among nurses, comparatively few investigations are recorded on the nature and incidence of other ailments.

"The Maintenance of High Standards of Health in the Nursing Community" was discussed at the Congress of the International Council of Nurses in 1937. Pietzcker (1937) gave the interim two-year report of the Health Statistics Committee, whose research work comprised a five-year plan, starting in 1934. Questionnaires were sent to the best-known nursing schools in 32 countries. They were evidently having educational value, for a 44% return was made in 1935, compared with 22% for the previous year; and hospitals were found to be introducing new measures with regard to staff health.

The United States National League of Nursing Education (1938) in its *Study of the Incidence and Costs of Illness among Nurses* published the results of a survey on the illnesses of student and graduate nurses. Two hundred and twenty-three nursing schools, comprising 17,364 student nurses and 8,794 graduate nurses, returned reports for the year 1937-8. The Study disclosed certain significant facts, among them the following:

(a) In the country as a whole student nurses had more illness than graduate staff nurses; the annual average number of days of illness per student nurse was 8.3 and per graduate nurse 6.6. (b) Clinical students were ill more than preclinical students. The annual average number of days of illness per clinical student was 9.2 and per preclinical student 5.2. (c) Students on the paediatric service or on the communicable diseases service had a higher illness rate than clinical students on all other services. (d) Average days of illness for both students and graduates were highest in January, February, and March. (e) The annual financial cost of hospital treatment for student and graduate nurses was estimated at 3 to 4 million dollars. (f) Health records of graduate and student nurses, as measured by days off for illness, were not so favourable as those of college students and of women in the clerical, industrial, and teaching fields.

A comparative study of the health of student nurses and girl college students was made by Diehl (1935), who kept records of minor and disabling illnesses among both groups during one school year. He included only those illnesses which were occasioned by acute infections or by other conditions which might be related to the work. Illnesses incurred by nurses during college vacations were not counted. After allowing for certain factors which might give rise to differences in the sickness rates of the "Nurse Group" and the "College Group," Diehl concluded that the incidence and severity of illness among the student nurses was distinctly greater than among college girls living in a comparable environment. He found that respiratory infections were 2.8 times as frequent among student nurses as among college girls, and superficial pyogenic infections 5.2 times as frequent. He attributed this to the fact that the nurses were more exposed to infection, both cutaneous and respiratory, than other students; that they had longer hours of duty; and that they were deterred from reporting minor illnesses immediately, since they had to make up time lost.

Among nurses at Cook County Hospital, Rhoads and Afremow (1938) found that acute throat infection was the greatest single cause of illness. They followed one class through its period of training and found that, on the average, each nurse was off duty for sickness for 75.5 days (7% of total training time) and that about 27% of this absence was attributable to upper respiratory tract infection. They analysed also the ward distribution of the nurses with sore throat, and discovered that where exposure to infectious diseases was greatest—i.e., the Children's Hospital and the Contagious Diseases Hospital—the incidence of throat infection was highest.

In a recent article Court (1943) reported that among the nurses of an E.M.S. sector hospital respiratory infection took first place both in days lost and in numbers of staff involved. The percentage incidence of staff so affected was 38 in 1941 and 45 in 1942, and was higher among nursing auxiliaries and assistants than among the professional group of trained and student nurses. He regarded the prevention of respiratory infection among hospital personnel as an urgent and important problem.

Sickness figures for a general hospital are given by Branson (1933) in his report on the health of nurses at St. Bartholomew's Hospital for 1922 to 1931. As an index of health he regarded the total independent attacks of illness occurring annually (especially when related to the number of nurses at risk) as more reliable than the figure for "nurse-days" lost. He found that the infections comprised by the terms "sepsis," "catarrhal disease," and "sore throat" provided, in a

Sickness Records of Nursing Staff in a London General Hospital

In order to obtain more detailed information the sickness records of the nursing personnel at University College Hospital (London), a general hospital with a training school, have been reviewed for the years 1936, 1937, and 1938. More recent data could not satisfactorily be analysed owing to the various administrative changes brought about by the war. About 80 student nurses entered the school each year; on entry all had a medical examination and a radiograph taken of the chest, and were immunized against diphtheria. Including resident masseuses, radiographers, dietitians, etc., and all grades of nurses, the numbers "at risk" were 410 for 1936, 475 for 1937, and 500 for 1938. The analysis was made from the "day book" of the resident medical officer and the home sister, who see sick staff each day, and from case records of those who were admitted to the hospital wards. In addition, data were obtained in some cases from infectious diseases hospitals and sanatoria to which nurses had been sent for treatment.

TABLE I.—Number of Attacks and of Days Off Duty for Sicknesses lasting Less than 100 Days

No. of nurses at risk	1936		1937		1938	
	410		475		500	
Nature of Sickness	No. of Attacks	Days Off Duty	No. of Attacks	Days Off Duty	No. of Attacks	Days Off Duty
Influenza	26	456	63	939	12	148
Colds	28	223	26	93	47	318
Sore throat	47	617	27	414	40	390
Boils, styes, etc. ..	59	637	43	340	96	1,045
Whitlow	46	639	27	253	57	851
Infectious diseases :						
Chicken-pox	0	0	4	101	2	97
Diphtheria	1	83	3	228	0	0
Measles	3	141	0	0	1	35
Mumps	1	31	1	13	0	0
Pertussis	1	28	0	0	0	0
Rubella	2	17	22	317	0	0
Scarlet fever	4	306	7	370	4	174
Catarrhal jaundice ..	0	0	5	184	4	69
Glandular fever	3	143	0	0	2	329
Gastro-enteritis	34	340	51	355	39	237
Other gastro-intestinal disorders	5	57	14	152	31	384
Injuries	22	189	26	214	37	222
Rheumatism, lumbago, and sciatica	8	129	10	257	11	
Operations :						
Appendicectomy	2	65	0	0	7	324
Mastoidectomy	1	92	0	0	1	87
Tonsillectomy	5	135	0	0	1	132
Other operations	2	77	2	133	1	40
Debility, etc.	9	100	5	81	5	73
Miscellaneous	31	475	25	269	22	213
Total	340	4,980	361	4,713	416	5,168

TABLE II.—Number of Attacks and Days Off Duty for Sicknesses lasting More than 100 Days

1936			1937			1938		
Nature of Sickness	No. of Attacks	Days Off Duty	Nature of Sickness	No. of Attacks	Days Off Duty	Nature of Sickness	No. of Attacks	Days Off Duty
Gastric ulcer	1	104	Appendicitis and Sonne dysentery ..	1	106	Septic glands of neck ..	1	104
Hyperthyroidism	1	Left	Hysteria and migraine	1	115	Polio-myelitis, abortive ..	1	143
Influenza and pleurisy	1	109	Influenza and lobar pneumonia	1	206	Rheumatoid arthritis ..	1	172
Sacro-iliac strain	1	166	Sinusitis followed by streptococcal septicæmia	1	236	Tonsillectomy	1	132
Scarlet fever and arthritis of knee ..	1	292	Sore throat and subacute mastoiditis ..	1	194	Tuberculosis, pulmonary ..	2	(a) Left (b) 335
Acute rheumatism	1	148	Tuberculosis :					
			Pulmonary	3	Left			
			Of ileum	1	"			
			Unresolved pneumonia	1	"			
Total	6	819+		10	857+		6	886+

descending scale of contribution, about 60% of the nurses' illnesses. The heading "sepsis" covered an ill-defined but large group of septic skin conditions—"septic fingers," similar lesions of the feet, and boils. A considerable majority of these cases were "septic fingers," and apparently a good many resulted from safety-pin pricks. In a fair number the disablement lasted for a long time. The term "catarrhal disease" described the miscellany of respiratory infections, such as "colds," "influenza," and their complications; the peak period for these attacks was in the early months of the year, and accounted at times for a considerable depletion of the available staff.

Tables I and II show in summary form the results of the analysis. Only sicknesses which involved absence from duty are recorded; these are divided into two parts—Table I, those of less than 100 days' duration; and Table II, those of more than 100 days' duration. This time-division is arbitrary, and serves merely to give an indication of the long illnesses of each year.

Table I shows that, taking the three-year period as a whole, pyogenic infections—i.e., boils, styes, whitlows, etc.—took first place, both as regards number of attacks and number of days off duty. Of a total of 1,117 attacks, 328 (29.4%) were due to pyogenic infections; and of a total of 14,861 sickness-days, 3,765 (25.3%) were due to this cause. Whitlows accounted for 130 (39.6%) of the attacks of pyogenic infection and for 1,743 (46.3%) of the sickness-

days due to it. During the three years whitlows were responsible for 11.6% of all sicknesses and for 11.7% of all sickness-days.

With figures only slightly lower than those for pyogenic infections followed the group of upper respiratory tract infections—"colds," "influenza," and sore throat—with 316 attacks (28.3% of all sicknesses) and 3,598 sickness-days (24.2% of the total). Taken together, therefore, respiratory and pyogenic infections accounted, as in Branson's figures, for nearly 60% of all illnesses and for half the number of days off duty.

Under the heading "gastro-enteritis" are included diarrhoea and/or vomiting. This condition tended to occur in outbreaks of two or three cases within a few days, or in larger outbreaks such as those of Nov.-Dec., 1937, and March-April, 1938, when 32 and 25 nurses respectively were affected. The nurses were scattered in different wards, suggesting that they had been infected from a common source—possibly in the home rather than in the hospital itself. (It is interesting to note that one of the nurses in the 1937 outbreak apparently introduced the infection to a children's ward, in which 7 children developed dysentery. From this nurse, and from 4 of the affected children, *Bact. sonnei* was isolated.)

The common infectious diseases (including scarlet fever, which might alternatively be classified as sore throat with rash) numbered 12 in 1936, 37 in 1937 (22 of which were rubella), and 3 in 1938. One case of diphtheria occurred in 1936 and 3 in 1937. The common infectious diseases were important on account of the number of days lost rather than of the number of attacks; during the 3 years they accounted for 4.7% of the total number of illnesses, but for 11.9% of the total sickness-days.

Injuries, including burns and scalds, amounted to 7.6% of all sicknesses and to 5.3% of all sickness-days. Whether or not they were due to hospital mishaps or accidents was not recorded, though in the few instances of lysol burns these were presumably incurred on duty.

Respiratory infection played a predominant part as a cause of the 22 "long illnesses" tabulated in Table II. Four of these were due to upper respiratory tract infections and their sequelae, two to influenza followed by pleurisy or pneumonia, and one to unresolved pneumonia. During the three years 7 of the nurses who suffered from long illnesses left the hospital; of these, 4 had developed pulmonary tuberculosis and 1 tuberculosis of the ileum. Another nurse, who suffered from pulmonary tuberculosis, returned after an absence of 11 months. The figures presented here are too few to form the basis for a discussion on the incidence of tuberculosis among nurses. A growing realization of the tuberculosis risk in hospitals has led to investigations by numerous workers, particularly in Norway and the United States. Soper and Amberson (1939) summarize the situation by stating that prevailing opinion strongly suggests that the incidence of tuberculosis is higher among student nurses than among females of similar age groups in the general population. Tuberculin tests almost without exception indicate year by year an increase of infection out of proportion to that of the general population. These authors advocate certain minimum precautions and stress the importance of case-finding among patients, for they consider that unrecognized cases of open tuberculosis are a serious menace in general hospitals.

Standards for the Maintenance of Nurses' Health

The Ministry of Health Interdepartmental Committee on Nursing Services (Interim Report, 1939) discussed the question of the care of nurses' health and the provision of medical attention, in the form both of medical inspection and of attention during sickness. The report stated that medical inspection of entrants seemed to be general, though not universal, but that apparently in most hospitals no further inspection was made during training. It recommended the practice of thorough medical examination, with a chest radiograph, four times during the training period and again on appointment to the staff.

Pietzcker (1937) tabulates the international figures derived from her questionnaire on the subject of medical inspections, chest radiography, immunization, etc. Her figures for seven countries, including Great Britain, are shown in Table III.

At the 1937 Congress of the International Council of Nurses Lambie of New Zealand emphasized the need for standards of health and service which could be followed in every training school. The following measures which she proposed are in many ways similar to those of the numerous American Health Programmes for Nurses, of which Fuld (1937) and Davies and Frost (1940) have described examples, and to the recommendations set out more recently in this country by the King Edward's Hospital Fund for London (1943) and by Court (1943).

1. General Health Measures.—(a) Adequate living conditions, with individual rooms and good recreation-rooms. (b) Three well-balanced and regular meals each day or night. (c) A carefully considered programme of work, recreation, outdoor exercise, and sleep. (d) Regular leave and off-duty time.

2. Physical Examinations, etc.—(a) Medical and dental examinations on entry. (b) Radiograph of chest on entry. (c) Diagnostic skin tests, and immunization against diphtheria and enteric fevers. (In some hospitals immunization against smallpox and scarlet fever is also the rule.) (d) Repetition of medical and dental examination, and of chest radiograph, at intervals of 6 to 12 months. (e) Repetition of tuberculin test six-monthly in negative reactors. (f) Monthly weight chart for each nurse. (g) Correction of physical defects, if any.

3. Care of Sick Nurses.—(a) Opportunity to report sick at any time without fear of rebuke. (b) Encouragement to report minor disturbances of health immediately. (c) Direct access to medical advice. (d) A properly equipped minor ailments surgery. (e) Adequate sick-room accommodation.

4. Aseptic nursing procedures which should be carried out in the light of modern bacteriological information and which should be kept up to date with new advances.

5. Education of the nurses as to the value of a health programme, and the development of their interest in preventive medicine and "positive health."

6. Research as to the effects of hospital service upon the health of nurses, as shown by the incidence, nature, and predisposing causes of their ailments.

TABLE III.—*Figures regarding Medical Examination, Immunization, etc., of Nurses in Various Countries. (From Pietzcker, 1937.)*

Country:	G.B.	U.S.A.	Canada	New Zealand	France	Norway	Rumania
No. of hospitals taking part ..	20	27	38	26	31	9	4
Percentage of examined nursing students rejected on grounds of ill-health	7	5	8	8	5	22	8
Percentage of hospitals giving x-ray examination to all nursing students	—	71	95	73	87	78	100
Percentage of hospitals giving immunization to nursing students against							
Smallpox	85	82	84	—	74	—	75
Diphtheria	25	85	84	—	74	11	25
Scarlet fever	15	44	47	—	—	—	25
Enteric fevers	—	85	74	50	97	22	50
Tuberculosis	—	—	—	—	—	33	—
Percentage of hospitals requiring or providing dental examination	95	89	90	100	71	67	75
Percentage of hospitals giving medical examination during first year to all nursing students	45	89	84	77	94	90	100
Percentage of hospitals giving medical examination; also later as a rule	0	85	58	62	52	44	100
Percentage of hospitals checking weight of nursing students monthly or quarterly	5	85	82	100	77	22	100

Discussion

While there has been considerable interest in the occurrence and prevention of tuberculosis among nurses, little information is available concerning the nature and incidence of other illnesses. Certain American workers have found that student nurses are more subject to illness than college girls; and Diehl (1935) observed that this higher morbidity rate was mainly due to cutaneous and upper respiratory tract infections. This fact he attributed to the nurses' occupational hazards; and data collected by the National League of Nursing Education in the United States confirm his findings. Its survey indicated that student nurses on their clinical course had a higher sickness rate than those who, on their preclinical course, were not in contact with ward work; and, further, that among nurses undertaking duties where exposure to infectious diseases was greatest—as on the paediatric and communicable diseases service—sickness rates were higher than elsewhere.

The figures presented here from the records of University College Hospital for 1936 to 1938 confirm those of Branson

for St. Bartholomew's Hospital for an earlier date, in that nearly 60% of all attacks of sickness were due to pyogenic and respiratory tract infections. In both series sepsis took first place, both for number of attacks and for number of days of sickness. In this they differed from the figures of Rhoads and Afremow and of Court, who found that respiratory tract infections were the main cause of absence through sickness. The high rate of whitlows among nurses is worth mentioning. Branson found that this condition was responsible for a considerable majority of the cases of sepsis; and at University College Hospital it accounted for 11.6% of all attacks of illness and of all days lost through sickness. Spooner (1941) observed that septic fingers and hands among the nurses of a surgical ward seriously interfered with the work; and the present investigation was, in fact, encouraged by the frequency of whitlows among the nurses of a war-wounds ward.

The many cross-infection studies of the last few years have shown that nurses not infrequently acquire infections from their patients. Okell and Elliott (1936), for example, working in an ear-nose-and-throat hospital, found that nurses were implicated in nearly half the ward outbreaks of haemolytic streptococcal infection, and that the nurses' infections were associated with the same types of haemolytic streptococci as those which cross-infected the patients. While aseptic techniques have been regarded mainly from the angle of protecting the patient from the nurse, their function is dual: they should also serve to protect the nurse from the patient. This aspect of nursing technique has been stressed more in sanatoria for tuberculosis than in other types of hospital.

The present scanty information regarding the predisposing causes of the illnesses to which nurses are prone indicates that there is scope for further investigation on the matter. That infection rates may vary considerably from one group of nurses to another within the same hospital is to be seen from the figures tabulated by Court. He found, for example, that respiratory infections during 1942 varied from a 23% incidence among student nurses to a 68% incidence among assistant nurses, and that, while septic fingers developed among 13% of the latter group, they occurred among only 1.6% of the trained staff. It would be interesting to know if the operating-theatre staff, who are protected by masking, gowning, and a meticulous aseptic technique, have a more favourable health record than nurses on ward duty.

To gain more knowledge of nurses' sicknesses and their causes careful recording and analysis would be required with regard to age, years of service, ward assignment, nature of duties, and day and night schedule; and also to the clinical character and duration of each sickness, and the length of sick-leave. In addition, accurate records of the number of nurses at risk in each circumstance would be needed for the determination of the comparative sickness rates. An investigation of this kind should throw light on the reasons for the generally recognized high rate of skin and respiratory tract infections among nurses; and the information gained would be a necessary preliminary to the introduction of special measures for their prevention.

Summary

An analysis is made of the nature and incidence of sickness among the nursing personnel at University College Hospital during the three years 1936 to 1938. More recent figures could not be used because of the various administrative changes brought about by the war.

Among the causes of sickness and days lost through sickness, pyogenic infection took first place, closely followed by upper respiratory tract infection. The two infections taken together accounted for nearly 60% of all sicknesses.

Whitlows were responsible for 40% of the pyogenic infections, and for 11.6% of all sicknesses and of all days lost.

Common infectious diseases were important for the number of days lost rather than for the number of nurses involved.

Of 22 long illnesses (more than 100 days), 6 were due to tuberculosis (5 pulmonary and 1 of the ileum); 7 other long illnesses were caused by complications resulting from respiratory infection.

The importance of nurses' sickness in relation to cross-infection problems is discussed, and stress is put upon the need to investigate further the predisposing causes of infection among nurses, as a preliminary to prevention.

I am indebted to the Matron, Assistant Matron, and Home Sister of University College Hospital for their assistance with this work; to the Nursing Committee of the hospital for permission to publish the figures; to Prof. A. A. Miles for his help and advice; and to the Medical Research Council for a personal grant.

REFERENCES

- Branson, W. P. S. (1933). *St. Bart's Hosp. Rep.*, **66**, 125.
 Court, D. M. (1943). *Lancet*, **2**, 753.
 Davies, E., and Frost, H. (1940). *Amer. J. Nurs.*, **40**, 1.
 Diehl, H. S. (1935). *Ibid.*, **35**, 1057.
 Fuld, L. F. (1937). *Med. Rec.*, **146**, 339.
 King Edward's Hospital Fund for London (1943). Memorandum on the Supervision of Nurses' Health, London.
 Lambie, M. J. (1937). Congress Papers: International Council of Nurses.
 Ministry of Health Interdepartmental Committee on Nursing Services (Interim Report), 1939, H.M.S.O., London.
 National League of Nursing Education, New York City (1938). *Study of the Incidence and Costs of Illness among Nurses*.
 Okell, C. C., and Elliott, S. D. (1936). *Lancet*, **2**, 836.
 Pietzcker, D. (1937). Congress Papers: International Council of Nurses.
 Rhoads, P. S., and Afremow, M. L. (1938). *Arch. Pathol.*, **26**, 403.
 Soper, W. B., and Amberson, J. B. (1939). *Amer. Rev. Tuberc.*, **39**, 9.
 Spooner, E. T. C. (1941). *J. Hyg.*, **41**, 320.

CYCLOPROPANE FOR DENTAL SURGERY IN CHILDREN*

BY

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School-children, a few younger pre-school children, and expectant and nursing mothers attend the Stretford Borough clinics for dental treatment. Roughly 65% of those offered treatment accept it. It being desirable that this percentage should rise, any necessary anaesthesia should be as pleasant and as free from distress as possible. I am indebted to Mr. Ronald Bradbury, L.D.S., now serving as a dental surgeon in the Army, to Miss A. M. Paterson, L.D.S., and to Miss P. E. Pendlebury, L.D.S., for their co-operation. A short account, by Mr. Bradbury and myself, of the first 75 cases with cyclopropane appeared in the *British Dental Journal* on June 3, 1943, and these cases are included in this series because, although the method was afterwards altered somewhat, the essence of it remained the same. Follow-up observation was impracticable, and so of only a small proportion is there any information as to progress at home.

The method is simple, and so is the apparatus required. This simplicity is made possible by the slowness with which CO₂ accumulates in a breathing-bag in the case of children, so that its removal by soda-lime absorption, which generally is a *sine qua non* in cyclopropane anaesthesia, is not necessary. For older children and longer operations than the extraction of teeth the method is thus unsuitable. The technique is almost rule of thumb. Cyclopropane is a most potent gas, but if given by an anaesthetist of experience there appears to be only one risk which he will have to bear in mind. As will be seen, its origin is salivation. Other anxieties are conspicuous by their absence. In roughly a quarter of these cases the administration was by students.

Cyclopropane recommends itself for this work because it combines the following desirable qualities, variously present in other agents: an attractive induction, rapid and smooth; ample time and ample depth of anaesthesia; freedom from untoward effects such as blueness, breath-holding, movement, spasm, difficulty of administration owing to mouth-breathing or attainment of a correct mixture or insufficiency. It also has one advantage over all others—the degree of jaw relaxation. Early relaxation of muscles is a characteristic of cyclopropane, but of the jaw muscles it is a peculiarity. As a rule the mouth gag is not used—a benefit by no means trivial. There are disadvantages, however, as will be seen, and they appear in the after-effects—chiefly sickness. Comparison has to be made with other satisfactory systems—with vinesthene, and with continuous nitrous oxide with oxygen, trilethene, or vinesthene. There are cases for which cyclopropane is preferable to any of these.

* A survey of the first 500 consecutive cases at the Borough of Stretford School Dental Clinic.