is clear that the large majority in both groups became infected; no significance can be ascribed to the slightly better results in the test group. From the point of view of post-operative treatment, patients with no indwelling catheter did a little better than those so treated, but it should be pointed out that six of these patients were not catheterized, and of these five were free from infection. Of the remaining 11 who were repeatedly catheterized, only one remained free.

Effect of Prophylactic Sulphonamide on Type of Infection

Table IV shows the organisms found in post-operative specimens of urine from the two groups of patients. It demonstrates that, although sulphonamides may prevent infection

TABLE IV.—*Organisms Found in Post-operative Specimens of Urine*

	Test Group (Sulphonamide Given)	Control Group (No Sulphonamide)
* Coliform bacilli	6	22
* *Str. faecalis*	36	12
Coliform bacilli + *Str. faecalis*	2	2
Other organisms	7	3
Total	51	39

* Figures for coliform bacilli and *Str. faecalis* include cases with one of these organisms together with another, such as *Staph. pyogenes.*

with coliform bacilli, it is at the expense of infections due to *Str. faecalis,* as infections with this organism are much more likely to occur in patients given prophylactic sulphonamides. No evidence was obtained that the patient's clinical course was altered. Of the patients given sulphonamides 29% developed a post-operative temperature of 100° F. (37.8° C.) or more : in the control group a similar temperature was recorded for 31%.

Discussion

Tables I and II show that the two groups of patients in this trial are not exactly comparable, the most important variation being in the number of patients in the two wards. This led to differences in post-operative management and possibly in nursing technique, but does not alter the conclusion that urinary infection followed operation with regularity whatever regime was used. In the circumstances described here, prophylactic treatment with sulphonamides has failed to prevent urinary infections after vaginal operations.

No support was obtained for the view that post-operative urinary infections are common in gynaecological patients because patients are frequently infected before operation. Pre-operative infection was found in only 6 out of the 113 patients from whom specimens were obtained. The use of an indwelling catheter for several days, or repeated catheterization, necessitated by mechanical factors, presumably accounts for the high rate of infection.

Summary

A clinical trial is described in which 60 patients undergoing vaginal operations, who were given 1 g. of "sulphatriad" three times a day for the first seven post-operative days, were compared with 42 controls who had no prophylactic treatment.

In both groups the urine of a large majority of the patients became infected.

Str. faecalis infections were relatively *more* frequent, and coliform bacilli *less* frequent in the sulphatriad group than in the controls.

Our thanks are due to Mr. John Beattie, Mr. Donald Fraser, and Mr. John Howkins, whose patients were the subject of the investigation, and to the two ward sisters and the nursing staff for their invaluable co-operation.

THE EFFECT OF AN INDWELLING CATHETER ON THE BACTERIOLOGY OF THE MALE URETHRA AND BLADDER

BY

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Various bacteria inhabit the normal urethra of the male. Thomson-Walker (1914), quoting Petit and Wasserman (1891), has stated that Löffler's bacillus, *Streptobacillus urethrae, Bact. coli, Staph. albus, Staph. aureus,* and *Staph. citreus* are the most constant organisms, while Harkness (1950) has stated that staphylococci, micrococci, diphtheroids, haemolytic streptococci, *Str. faecalis,* and "Rosenthal's large diplococcus" are the organisms most often found. These bacteria exist without any clinical or microscopical evidence of urethritis, and are presumably saprophytic.

When an indwelling urethral catheter is retained for any length of time a urethritis, less severe when latex rubber catheters are used, almost always results. The urethral organisms are then said to be commonly *Staph. albus* and haemolytic streptococci, and sometimes *Str. faecalis* (Harkness, 1950).

An indwelling catheter also results in the vast majority of cases, and despite administration of sulphonamides and antibiotics, in a cystitis of varying degree. Topley and Wilson (1946) state in general that the commonest bacteria found in cases of cystitis are *Bact. coli, Bact. aerogenes, Pr. vulgaris, Str. faecalis, Ps. pyocyanea,* and staphylococci, but the bladder organisms in the specific circumstances when indwelling catheters are retained are not recorded in the literature available to us.

To investigate the nature of the bacterial flora which occurs in the urethra and bladder in the presence of an indwelling catheter, and to determine the relationship, if any, between the organisms coincident at the two sites, we took a series of urethral swabs and catheter specimens of urine for bacteriological examination from 20 patients at daily or two-daily intervals. In 6 of the 20 patients the studies were made before prostatectomy; in the remaining 14 patients the studies were made after prostatectomy. The urethral swabs were taken from the fossa navicularis; the urine specimens were taken simultaneously from the distal end of the catheter.

To supplement the investigation, we also determined, by similar methods, the nature of the bacterial flora of (i) the urethra of 9 urological and 4 non-urological male patients not previously instrumented or catheterized, (ii) the recently instrumented urethra in 11 patients, and (iii) the urine passed either shortly before (midstream) or withdrawn at the time of insertion of an indwelling urethral catheter in 18 patients.

The bacteriological cultures were made on blood agar and MacConkey agar plates, and were incubated aerobically at 37° C. for 24 hours. No anaerobic cultures were made.

Coagulase-positive staphylococci are referred to as *Staph. aureus,* and micrococci and coagulase-negative staphylococci are together referred to as *Staph. albus.*

Results

(i) Cultures of Urethral Swabs from the Urethra of Male Patients Not Previously Instrumented or Catheterized

Bacteriological culture of single urethral swabs from 13 non-instrumented and non-catheterized patients, 9 urological and 4 non-urological, proved to be sterile in 3 instances and grew various organisms in 10 (Table I). In 6 of the patients single organisms were cultured, while in 4 multiple organisms were grown.

TABLE I.—*Cultures of Urethral Swabs from the Urethra of Male Patients not Previously Instrumented or Catheterized*

Case No.		Case No.	
1	Sterile	15	*Staph. albus*
2	*Pr. vulgaris*	16	Sterile
3	Sterile	21	*Staph. albus, Str. faecalis*
6	Diphtheroids	22	*Staph. albus*, diphtheroids
7	*Staph. albus*	23	*Bact. coli*, diphtheroids
11	*Staph. aureus*	24	*Str. faecalis*
14	*Staph. albus*, diphtheroids		

Cases 1–16 inclusive are urological, non-instrumented, and non-catheterized patients. Cases 21–24 inclusive are non-urological patients.

Analysis of all the organisms cultured from single urethral swabs of the 13 patients showed *Staph. albus* on 5 occasions, diphtheroids on 4, *Str. faecalis* on 2, *Staph. aureus* on 1, *Bact. coli* on 1, and a *Proteus* organism on 1.

(ii) Cultures of Urethral Swabs from Recently Instrumented Patients

Bacteriological cultures of single urethral swabs from 11 patients, all urological and recently instrumented, proved to be sterile in one instance and grew various organisms in 10 (Table II). In 5 of the patients single organisms were cultured, while in 5 multiple organisms were grown.

TABLE II.—*Cultures of Urethral Swabs from Recently Instrumented Patients*

Case No.		Case No.	
4	*Staph. aureus*, haem. strep.	13	*Bact. coli, Str. faecalis*
5	*Str. faecalis*	17	*Staph. aureus, Bact. coli*
8	*Staph. albus*, diphtheroids	18	Diphtheroids
9	*Staph. albus*	19	Sterile
10	*Str. faecalis*	20	*Staph. albus*
12	*Staph. albus, Staph. aureus*		

Analysis of all the organisms cultured from single urethral swabs of the 11 patients showed *Staph. albus* on 4 occasions, *Str. faecalis* on 3, *Staph. aureus* on 3, *Bact. coli* on 2, diphtheroids on 2, and a haemolytic streptococcus on 1.

(iii) Cultures of Bladder Urines Taken Either Shortly Before or at the Time of Insertion of an Indwelling Catheter

Bacteriological culture of single specimens of bladder urines of 18 patients taken either shortly before (midstream specimens) or at the time of insertion of an indwelling urethral catheter proved to be sterile in 8 instances and grew organisms in 10 (Table III). In 7 of the patients, single organisms were cultured, while in 3 multiple organisms were grown.

Analysis of all the organisms cultured from the single specimens of bladder urine of the 18 patients showed *Bact. coli* on 4 occasions, *Staph. aureus* on 3, *Str. faecalis* on 2, *Staph. albus* on 2, a paracolon bacillus on 1, and diphtheroids on 1.

(iv) Cultures of Urethral Swabs from Patients with Indwelling Catheters

(*a*) *Before Prostatectomy.*—Bacteriological cultures of urethral swabs from 6 patients with indwelling urethral catheters before prostatectomy grew organisms, sooner or later, in every case (Table III). In the cultures of four (an arbitrary number taken for convenience) consecutive swabs taken from each patient at daily or two-daily intervals following catheterization, there were single organisms on 10 occasions and multiple organisms on 11 (in three instances the cultures were sterile).

Analysis of all the organisms cultured from the four consecutive urethral swabs of the 6 patients showed *Staph. albus* on 16 occasions, *Staph. aureus* on 4, diphtheroids on 4, *Proteus* organisms on 4 (*vulgaris* 3, *morgagni* 1), haemolytic streptococci on 2, paracolon bacilli on 2, *Bact. coli* on 1, and *Str. faecalis* on 1. In 3 of the 6 patients there was a degree of constancy of organisms in the four consecutive swabs.

(*b*) *After Prostatectomy.*—Bacteriological cultures of urethral swabs from 14 patients with indwelling urethral catheters after prostatectomy grew organisms, sooner or later, in every case. In the cultures of four consecutive swabs taken from each patient at daily or two-daily intervals after operation, there were single organisms on 25 occasions and multiple organisms on 26 (in five instances the cultures were sterile). Analysis of all the organisms cultured from four consecutive swabs of the 14 patients showed *Staph. albus* on 27 occasions, *Bact. coli* on 24, *Str. faecalis* on 13, *Staph. aureus* on 12, *Proteus* on 7 (*morgagni* 4, *vulgaris* 3), diphtheroids on 3, *Bact. aerogenes* on 2, *Ps. pyocyanea* on 1, and a paracolon on 1. In 9 of the 14 patients there was a degree of constancy of organisms in the four consecutive swabs.

(v) Cultures of Bladder Urines from Patients with Indwelling Catheters

(*a*) *Before Prostatectomy.*—As shown in Table III, bacteriological cultures of the bladder urines from the 6 patients with indwelling urethral catheters before prostatectomy grew organisms in every case within a day or so of insertion of the catheters : 4 of the 6 patients had sterile urines at the time the catheters were passed. In the cultures of four consecutive specimens taken from each patient at daily or two-daily intervals there were single organisms on 11 occasions and multiple organisms on 10 (in three instances the cultures were sterile). Analysis of all the organisms cultured from the four consecutive specimens of the 6 patients showed *Bact. coli* on 10 occasions, *Str. faecalis* on 9, *Ps. pyocyanea* on 4, *Staph. albus* on 4, *Proteus* on 3 (*morgagni* 2, *vulgaris* 1), a paracolon bacillus on 2, *Staph. aureus* on 1, and *Str. viridans* on 1. In 4 of the 6 patients there was a degree of constancy of organisms in the four consecutive specimens.

(*b*) *After Prostatectomy.*—Bacteriological cultures of the bladder urines from the 14 patients with indwelling urethral catheters after prostatectomy grew organisms in every case within a day or so of the insertion of the catheter. In the cultures of four consecutive specimens taken from each patient, at daily or two-daily intervals, there were single organisms on 26 occasions and multiple organisms on 19 (in 11 instances the cultures were sterile). Analysis of all the organisms cultured from the four consecutive specimens of the 14 patients showed *Bact. coli* on 19 occasions, *Proteus* on 17 (*morgagni* 12, *vulgaris* 5), *Str. faecalis* on 9, a paracolon bacillus on 8, *Staph. aureus* on 7, *Ps. pyocyanea* on 5, *Bact. aerogenes* on 3, *Staph. albus* on 3, and diphtheroids on 1. In 12 of the 14 patients there was a degree of constancy of organisms in the four consecutive specimens.

Discussion

The present study virtually confirms the statements of previous authors (Thomson-Walker, 1914 ; Harkness, 1950) that the saprophytic organisms of the normal male urethra are staphylococci, *Str. faecalis*, diphtheroids, *Bact. coli*, *Str. viridans*, and bacilli of the *Proteus* group. Our observations also suggest that recent instrumentation does not materially affect the nature of this bacterial flora.

Before prostatectomy we found the commonest urethral organism, when an indwelling urethral catheter was retained, was *Staph. albus*. This confirms, in part, the statement of Harkness (1950). We did not, however, commonly find haemolytic streptococci or *Str. viridans*, while we did find diphtheroids, *Proteus* strains, *Staph. aureus*, paracolon bacilli, and *Bact. coli*.

After prostatectomy we still found that *Staph. albus* was the commonest urethral organism, but that *Bact. coli* was almost as common. It was not unusual to find *Str. faecalis*, *Staph. aureus*, and *Proteus* strains, while diphtheroids, *Bact*

aerogenes, Ps. pyocyanea, and paracolon bacilli were present on occasion. We did not find haemolytic streptococci.

The main difference, therefore, between the bacterial flora of the urethra before and after prostatectomy was the marked development of *Bact. coli* after that operation.

Before prostatectomy we found the commonest organism in the bladder urine when an indwelling catheter was retained was *Bact. coli. Str. faecalis* was almost as common, while *Ps. pyocyanea, Staph. albus, Proteus* strains, *Staph. aureus,* paracolon bacilli, and *Str. viridans* also occurred.

After prostatectomy we still found that *Bact. coli* was the commonest organism in the bladder urine, but that a *Proteus* strain was almost as common. *Str. faecalis,* paracolon bacilli, *Staph. aureus,* and *Ps. pyocyanea* were not uncommon, while *Bact. aerogenes, Staph. albus,* and diphtheroids also occurred.

TABLE III.—*Bacteriological Cultures of Urethral and Bladder Urine Organisms*

Case No.						
1	Urethra	(C) *Staph. albus*	*Staph. albus*	*Staph. albus*	*Staph. albus*	
	Bladder	Sterile	*Staph. albus*	*Bact. coli, Pr. vulgaris*	*Bact. coli*	
2	Urethra	(C) *Pr. vulgaris*	*Staph. albus;* haemolytic streptococci, Group B	Sterile	*Staph. albus;* diphtheroids; *Pr. vulgaris*	
	Bladder	Sterile	Sterile	*Staph. albus*	*Staph. albus*	
3	Urethra	Sterile	(C) *Staph. albus*	*Staph. albus*	Sterile	*Staph. albus;* diphtheroids
	Bladder	Sterile	*Str. faecalis; Pr. morgagni*	*Str. faecalis; Ps. pyocyanea*	*Str. faecalis; Ps. pyocyanea*	*Str. faecalis; Ps. pyocyanea*
4	Urethra	(I.C.) ●x *Staph. aureus;* haemolytic streptococci, Group C	●x Sterile	●x *Staph. albus*	●x *Staph. albus; Staph. aureus*	
	Bladder	*Staph. aureus*	*Str. faecalis; Ps. pyocyanea*	Paracolon	*Pr. morgagni*	
5	Urethra	(I) *Str. faecalis*	(C) Paracolon	*Staph. albus; Staph. aureus ; Pr. vulgaris*	*Pr. morgagni*	*Staph. aureus;* paracolon
	Bladder	*Bact. coli*	*Bact. coli*	*Bact. coli*	*Bact. coli*	*Bact. coli*
6	Urethra	Diphtheroids	(C) *Staph. albus;* diphtheroids	*Staph. albus;* diphtheroids	*Staph. albus; Bact. coli*	*Staph. albus; Str. faecalis*
	Bladder	Sterile	*Str. faecalis; Str. viridans; Bact. coli*	*Str. faecalis; Bact. coli*	*Str. faecalis; Bact. coli*	*Staph. albus; Str. faecalis;* paracolon; *Bact. coli*
7	Urethra	*Staph. albus*	(P.C.) ●x *Staph. albus*	●x *Staph. albus*	●x *Staph. albus*	●x *Staph. albus*
	Bladder	*Staph. albus*	Sterile	Sterile	*Bact. coli; Pr. morgagni*	*Bact. coli; Pr. morgagni*
8	Urethra	(I) *Staph. albus ;* diphtheroids	(P.C.) ●x Sterile	●x *Ps. pyocyanea*	●x Sterile	●x *Staph. albus*
	Bladder	*Staph. aureus*	Sterile	*Ps. pyocyanea*	*Pr. morgagni; Str. faecalis*	*Pr. morgagni; Ps. pyocyanea*
9	Urethra	(I) *Staph. albus*	(P.C.) ●x *Staph. albus; Str. faecalis*	●x *Str. faecalis; Bact. coli*	●x *Staph. albus; Str. faecalis; Bact. coli*	●x *Staph. albus; Bact. coli*
	Bladder	Sterile	Sterile	Sterile	*Staph. albus*	*Staph. albus*
10	Urethra	(I) *Str. faecalis*	(P.C.) x *Str. faecalis; Bact. coli*	x *Bact. coli*	x *Str. faecalis; Bact. coli*	x *Str. faecalis; Bact. coli*
	Bladder	*Str. faecalis; Bact. coli*	Diphtheroids; *Bact. coli*	*Bact. aerogenes*	*Bact. aerogenes; Ps. pyocyanea*	*Bact. aerogenes; Ps. pyocyanea*
11	Urethra	*Str. viridans;* diphtheroids	(I.P.C.) ●x *Staph. albus*	●x *Staph. aureus*	●x *Staph. aureus*	●x *Staph. aureus*
	Bladder	*Staph. aureus*	Sterile	*Pr. morgagni*	Paracolon	*Pr. morgagni*
12	Urethra	(I) *Staph. aureus; Staph. albus*	(P.C.) ●○ *Staph. albus*	●○ *Staph. albus ;* diphtheroids	●○ Sterile	●○ *Staph. albus; Str. faecalis*
	Bladder	Sterile	*Pr. morgagni*	*Pr. morgagni; Ps.pyocyanea; Str.faecalis*	*Pr. morgagni; Str. faecalis*	*Pr. morgagni; Str. faecalis*
13	Urethra	(I) *Str. faecalis; Bact. coli*	(P.C.) ●□ *Str. faecalis; Bact. coli*	●□ *Staph. aureus; Str. faecalis; Bact. coli*	●□ *Staph. aureus; Bact. coli*	●□ *Staph. aureus; Bact. coli*
	Bladder	*Bact. coli*	*Bact. coli*	*Staph. albus; Bact. coli*	*Staph. aureus; Bact. coli*	*Staph. aureus; Bact. coli*
14	Urethra	*Staph. albus;* diphtheroids	(P.C.) ●□ Sterile	●□ *Staph. albus*	●□ *Staph. albus; Staph. aureus;* diphtheroids	●□ *Staph. albus; Staph. aureus; Bact. coli;* diphtheroids
	Bladder	*Staph. albus;* diphtheroids	Sterile	*Bact. coli*	Paracolon	*Bact. coli*
15	Urethra	*Staph. albus*	(I.P.C.) ●□ *Staph. aureus*	●□ *Staph. albus*	●□ *Staph. albus*	●□ *Staph. albus*
	Bladder	Paracolon	Sterile	*Pr. morgagni*	Sterile	Paracolon
16	Urethra	Sterile	(P.C.) ●□ *Staph. albus*	●□ *Bact. coli*	●□ Paracolon	●□ *Staph. albus; Staph. aureus*
	Bladder	Sterile	*Str. faecalis;* paracolon	Paracolon	Paracolon	Paracolon
17	Urethra	(I) *Staph. aureus; Bact. coli*	(P.C.) ● x *Bact. coli*	● x *Bact. coli*	● x *Staph. albus; Bact. coli*	● x *Bact. coli*
	Bladder	Sterile	*Bact. coli*	*Bact. coli*	*Bact. coli*	*Str. faecalis; Bact. coli*
18	Urethra	(I) Diphtheroids	(P.C.) x *Staph. albus; Bact. coli*	x *Staph. aureus; Str. faecalis; Bact. coli; Pr. vulgaris*	x *Staph. albus; Bact. coli; Pr. vulgaris*	x *Str. faecalis; Bact. coli; Pr. vulgaris*
	Bladder	*Str. faecalis; Bact. coli*	*Bact. coli; Pr. morgagni*	*Staph. aureus*	*Str. faecalis; Bact. coli; Pr. vulgaris*	*Str. faecalis; Bact. coli; Pr. vulgaris*
19	Urethra	(I.P.C.) ● x Sterile	● x *Staph. albus; Staph. aureus; Bact. aerogenes*	● x *Staph. albus ; Bact. coli; Bact. aerogenes; Pr. vulgaris; Str.faecalis*	● x *Str. faecalis; Bact. coli*	
	Bladder	*Str. faecalis; Bact. coli*	*Staph. aureus; Pr. vulgaris*	*Staph. aureus; Bact. coli; Pr. vulgaris*	Paracolon; *Bact. coli; Pr. vulgaris*	
20	Urethra	(I.P.C.) □ *Staph. albus*	□ *Staph. albus; Pr. morgagni*	□ *Pr. morgagni*	□ *Bact. coli; Pr. morgagni*	
	Bladder	Sterile	Sterile	*Bact. coli*	*Bact. coli*	

C=insertion of catheter; P.C.=prostatectomy and insertion of catheter; I=instrumentation; ●=penicillin; x=sulphonamides; □=streptomycin; O=chloromycetin. The post-catheter cultures were from specimens taken at daily or two-daily intervals.

The main difference, therefore, between the bacterial flora of the bladder urine before and after prostatectomy was the marked development of *Proteus* strains after that procedure. Presence or absence of organisms in the bladder urine before retention of an indwelling catheter did not appear materially to affect the nature of the bacterial flora which subsequently developed after retention of the catheter.

Comparing the organisms which occur coincidently in the urethra and the bladder urine in the presence of an indwelling urethral catheter before prostatectomy, it is seen that there is little relationship between the bacterial flora of the two sites. *Staph. albus, Staph. aureus,* diphtheroids, and *Proteus* strains predominate in the urethra, whereas *Bact. coli* and *Str. faecalis* predominate in the bladder urine in these circumstances.

After prostatectomy, however, it is seen that there is a closer relationship. For there is a high incidence of *Bact. coli* in both the urethra and the bladder urine in these circumstances. Nevertheless, the relationship is not by any means complete, because there is also a high incidence of *Staph. albus, Str. faecalis,* and *Staph. aureus* in the urethra, whereas there is a high incidence of *Proteus, Str. faecalis,* paracolon bacilli, and *Ps. pyocyanea* in the bladder urine.

Summary

The nature of the bacterial flora which occurs coincidently in the urethra and bladder in the presence of an indwelling urethral catheter has been investigated in patients before and after prostatectomy.

The bacterial flora of (*a*) the previously non-instrumented and non-catheterized male urethra, (*b*) the recently instrumented male urethra, and (*c*) the urine passed either shortly before (midstream) or withdrawn at the time of insertion of an indwelling urethral catheter, has also been studied.

It has virtually been confirmed that the saprophytic organisms of the virgin male urethra are staphylococci, *Str. faecalis,* diphtheroids, *Bact. coli, Str. viridans,* and bacilli of the *Proteus* group.

Recent instrumentation did not appear materially to affect the nature of the urethral bacterial flora.

Presence or absence of organisms in the bladder urine before retention of an indwelling catheter did not appear materially to affect the nature of the bacterial flora which developed subsequent to retention of a catheter.

Before prostatectomy the commonest urethral organism when an indwelling urethral catheter was retained was *Staph. albus.*

After prostatectomy the commonest urethral organism when an indwelling urethral catheter was retained was still *Staph. albus. Bact coli,* however, was almost as common.

The main difference between the bacterial flora of the urethra before and after prostatectomy was the marked development of *Bact. coli* after prostatectomy.

The main difference between the bacterial flora of the bladder urine before and after prostatectomy was the marked development of *Proteus* strains after prostatectomy.

Little relationship was found between the coincidental bacterial flora of the urethra and bladder when an indwelling urethral catheter was retained before prostatectomy. The relationship was closer after prostatectomy, but was by no means complete.

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RESPIRATORY FAILURE IN ACUTE CHEST INFECTIONS

BY

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Since the introduction of chemotherapy in 1937–8, the mortality in England and Wales from lobar pneumonia among men aged 40–65 has fallen from 500–600 per million to 100 per million. There has, however, been no comparable fall in the death rate from "bronchitis," which has remained at the level of 800–1,000 per million for the last 10 years (Fig. 1). There are at least three possible explanations for this discrepancy: (1) That the majority of patients with "bronchitis" do not receive antibiotic therapy; (2) that the chemical, viral, and bacterial causes of exacerbations of "bronchitis" are not susceptible to the available therapeutic

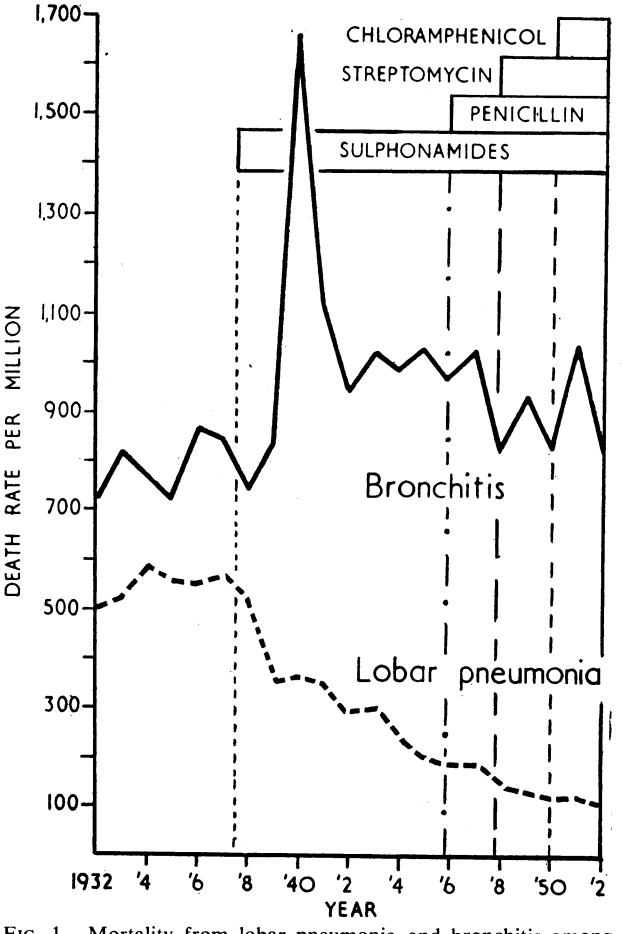

Fig. 1.—Mortality from lobar pneumonia and bronchitis among males aged 40–65 in England and Wales (based on Registrar-General's figures).

*British Medical Association Ernest Hart Memorial Scholar, 1952–3.