from the urethra grew no pathogen. He made a
full recovery when treated with benzyl
penicillin 1 mega unit intramuscularly six
hourly.

His wife, who was without symptoms at this
time, eventually agreed to be examined. She had
cervicitis without erosion but no clinical evi-
dence of urethritis. Cultures, however, grew the
gonococcus from both sites.

This family demonstrates once again the
well-known latency of gonorrhoea in women, and
it also seems very likely that the condi-
tion had remained latent in the husband
until septicemia ensued though no proof of
this can be obtained. The most unusual find-
ing was the development of one of the
rarest of the complications of gonorrhoea,
namely, gonococcal septicemia in both hus-
bond and wife. We have not been able to
find a similar example recorded in the
literature.—We are, etc.,

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How Infectious is Gonorrhoea?

Sir,—Dr. A. S. Wrigfield (16 December,
p. 672) provides some evidence that
gonorrhoea is a highly infectious disease and
that there is little difference in the infectivity
rates for males and females. This is remark-
able when one considers that gonococci im-
planted on the cervix are not exposed to the
considerable fluid flows present in the male
urethra during micturition. Further, the
cases described by Dr. W. K. E. Bernfield
(21 October, p. 173) show that within an
hour after intercourse gonococci can be
anchored to the urethral mucosa and are
able to resist the flow of urine. In a recent
electron-microscope study of human gonorr-
hoea we have demonstrated the specific ad-
herence of gonococci to cells from the
urethral mucosa (see fig.). This attachment
can explain the ability of the gonococcus to
maintain itself in the urethra despite mictur-
tion.

Currently we are investigating the mecha-
nism of this attachment. Freshly isolated
gonococci possess long hair-like filaments,
pili, which can be seen radiating from the
cells on electron microscopy.5 On subculture
in the laboratory these gonococci mutate to
lose their pili. Our preliminary results show
that gonococci with pili have a much greater
ability to attach to human fibroblasts than the
non-pilmented mutants of the same strain.
Furthermore, a scanning electron-micro-
scope study of human Fallopian tubes main-
tained in an organ bath during perfusion
with pilated gonococci has revealed organisms
apparently anchored down to the epithelial
surface by their pili. It would seem likely,
then, that the critical factor in the high in-
fecctivity of gonorrhoea is the ability of
pilated gonococci to attach to mucosal cells.
Nevertheless, the non-pathogenic neisseria
which grow on mucosal surfaces are also
piliated, suggesting that other factors, such
as resistance to host defence systems,4 must
be important in the virulence of the gonoc-
coccus.—We are, etc.,

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1 Ward, M. E., and Watt, P. J., Journal of Infecc-
tious Diseases, 1972, 134, 601.
2 Swanson, J., Krasa, S. J., and Gonschiel, R. C.,
Journal of Experimental Medicine, 1971, 134,
616.
4 Ward, M. E., Watt, P. J., and Glynn, A. A.,

Glove-powder Peritonitis

Sir,—Following the publication of my
letter on glove-powder peritonitis (17 July
1971, p. 183) and a scientific paper by Mr.
Julian Neely and Mr. J. Douglas Davies (11
September 1971, p. 625) considerable corre-
spondence has been received indicating that
this type of peritonitis is much more com-
mon than was supposed. It seems that there
is no substitute for the corn starch used,
and the only way of avoiding this complica-
tion is to avoid the corn starch. One of the
principal glove manufacturers kindly pro-
duced for a trial period gloves prepared
without the use of the corn-starch powder,
which is normally applied as a slurry at the
end of the manufacturing process. These
gloves, gamma-ray sterilized, were a little
more difficult to apply because it was neces-
sary for the hands to be really dry. How-
ever, they not only eliminated completely
the powder risk, but were a tremendous
improvement in quality and did not become
sticky in use; the grip was very much more
satisfactory at the end of a long period of
operation. These gloves were tried by various
surgeons in different parts of the
country and unfortunately the consensus of
opinion was against their use on account
of the difficulty of application. The manu-
facturers will therefore not proceed with
this project as a commercial undertaking. For
those who cannot dry their hands adequately,
the difficulty of application could be over-
come by the use of Bio-Sorb cream, a corn-
starch preparation (which can be supplied
in sachets). This avoids the use of scattered
powder. It seems incredible that this risk
to patients, acknowledged as very real, has
got to continue because of the additional ex-
 pense of manufacturing safe gloves.

There is little doubt that now we are
aware of the risk of corn-starch peritonitis
legal liability, in the event of this develop-
ing fairly and squarely against the
neisseria
and the manufacturers. Rubbing the
gloves with a swab wetted with cetrimide
removes much of the powder, but even after
such a vigorous application and rinsing
there is still a considerable amount remain-
ing ingrained in the surface of the glove,
as shown by a subsequent rinsing. A quick
rinse alone is utterly insufficient. The only
way of avoiding the risk is the elimination
of corn powder in manufacture. Surely
commercial considerations must be overcome.—
I am, etc.,

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Pulmonary Oedema in Pulmonary
Thromboembolism

Sir,—One of the reasons for the poor
diagnostic rate1 in the very common2 condi-
tion of pulmonary thromboembolism is the
variety of ways in which it may be manifest.
Your report (30 December, p. 773) of an
excellent clinicopathological conference on
heart failure in a middle-aged woman con-
tains a statement by Dr. Celia Oakley that
"pulmonary embolism...does not cause
pulmonary oedema." Since the appearance
unchallenged of this statement in your
columns suggests that this is a commonly
accepted view, we wish to draw attention to
the considerable contrary experimental
and clinical evidence.

In 1942 Megibow et al.3 demonstrated that
pulmonary oedema frequently complicated
experimental pulmonary embolization in
dogs. Dexter in 19654 observed that in
patients with preexisting heart disease the
only manifestation of pulmonary embolism
may be a subtle worsening of cardiac function,
often presenting itself as pul-
monary congestion or occasionally as florid
pulmonary oedema. During the past few
years we have had the opportunity to study
11 patients who presented with pulmonary
oedema. Although this was shown by sub-
sequent investigation, including haemodynamic measurements and pulmonary
angiography, to be due to

Fig. 1.—Electron micrograph showing gonococci (G) closely adherent to the surface of a urethral epithelial cell (E) from a male patient with asymptomatic gonorrhoea. The bar represents 500 nm.