TABLE IV.—*Distribution of Antibody Titres to Influenza Virus A Soluble Antigen*

	No. of Sera having Titres of:					Total Sera	Per- centage 1/2 or Less	Per- centage 1/8 or More
	1/2 or Less	1/4	1/8	1/16	1/32			
Trial group: Acute-stage sera	0	8	15	5	0	28	0	71
Control group: Acute-stage sera	19	7	6	1	1	34	56	24
Convalescent sera from confirmed cases of in- fluenza A ..	0	4	5	7	0	16	0	75

confirmed as influenza A by at least one serological test in the control group. In the control group 56% of acute-stage sera had titres of 1/2 or less, whereas in the trial group all had a titre of at least 1/4, and 71% had a titre of 1/8 or higher. Furthermore, as was found with the H.I. tests, the distribution of titres of acute-stage sera in the trial group was very similar to that for convalescent sera from the confirmed cases of influenza A in the control group. Titres to influenza B soluble antigen did not differ in the control and trial groups, which suggests that the differences with influenza A soluble antigen were due to specific antibody. It seems improbable, therefore, that the soluble antigen complement-fixation test has any advantage over the H.I. test for the diagnosis of influenza in persons recently vaccinated with vaccine of the type used in this trial.

The main disadvantage of using clinical methods unaided by laboratory tests in the assessment of an influenza vaccine is that the proportion of illnesses correctly diagnosed as influenza is unknown, and so the degree of protection conferred cannot be determined. If the proportion of cases of true influenza to the total number of clinically diagnosed cases is low the resulting dilution may obscure the protective effect even of a good vaccine. This is particularly undesirable in the experimental stages of the development of a vaccine, when quite small differences may have considerable significance. However, it is essential that a trial method should be free from observer bias, and the clinical method in a well-designed trial has this virtue, whereas the serological method is open to question. Unless it can be shown that the chance of obtaining a detectable fourfold rise in antibody following natural infection is unrelated to the initial antibody level it would appear unwise to rely on serological methods only in any estimate of protection.

Perhaps the most important contribution which the laboratory can make to the precision of a large-scale field trial at the present time is in determining the duration and type of any influenza outbreak in communities in which the inoculated volunteers live or work. Periods in which there is no detectable virus influenza can then be excluded from the final analysis. Furthermore, knowledge of the proportion of influenza to non-influenzal illnesses in the control group during the epidemic period would help in the interpretation of protection rates calculated from clinical diagnoses alone.

Summary

In a small-scale influenza vaccine trial undertaken mainly to determine the practicability of a trial method using both clinical and laboratory tests in the diagnosis of influenza, results led to the conclusion that the assessment of a vaccine on purely clinical grounds might understate the degree of protection, whereas one based on serological findings might exaggerate it. Possible reasons for this difference are discussed. It is concluded that, until it is shown that serological methods are able to detect cases of influenza equally well in persons who have received an influenza vaccine and in those who have not, serological diagnosis should not be the only

method of diagnosis used in a vaccine field trial. In a clinical assessment the fullest use should be made of laboratory evidence to define the epidemic period in the communities concerned and to estimate the proportion of illness in the control group due to influenza virus infection. This information would enable dilution of the figures by non-influenzal illness to be reduced and should allow a more accurate assessment of the vaccine to be made.

We should like to thank the management of Vauxhall Motors Ltd. for giving facilities for this trial, and their employees who volunteered to be immunized and who tolerated blood and other tests with such good humour. We are especially grateful to the firm's medical officers, Dr. A. R. Thomson and Dr. P. M. Bennett, for their great help in finding and interviewing volunteers and giving inoculations; to Mr. Humby, of the factory records department, for his daily list of absentees; and to Dr. J. H. C. Walker, Director of the Luton Public Health Laboratory, for separating sera and storing specimens. We are indebted to Dr. R. M. Dykes, Medical Officer of Health, Borough of Luton, for his help and encouragement in the organization of this investigation.

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A FOLLOW-UP TUBERCULIN SURVEY IN THE RHONDDA FACH

BY

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Tuberculin-testing of the school population of the Rhondda Fach was first undertaken in 1950-1 as an integral part of the total community x-ray survey carried out in this mining valley during that period (Cochrane *et al.*, 1952). The object of the first survey was to ascertain the prevalence of cases of pulmonary tuberculosis in the valley, whether already known or as yet undiscovered, and to isolate and treat all active and infectious cases. The object of the second survey was to determine the effect of the first survey on the tuberculosis situation in the valley (Cochrane *et al.*, 1955). It was thought that tuberculin-testing of the school population should provide evidence on the existing degree of total tuberculous infectivity in 1950-1 and that retesting in 1953 might reflect changes in this situation resulting from the efforts made during the first x-ray survey of the valley. A sample of schoolchildren in another "control" valley were also tested in 1951, and a similar sample of children from the same schools were retested in 1954. This retesting has been combined with a follow-up study of children who were tuberculin-tested on both occasions, in the hope that a determination of the conversion and reversion rates in the two valleys might be compared.

Method of Testing

In order that the results of tuberculin-testing in 1953-4 should be comparable with those obtained in 1950-1, the same Mantoux technique was employed on both occasions—namely, 0.1 ml. of a 1/10,000 dilution of standardized O.T.—that is, 1 T.U.—was injected intradermally, and all negative reactors were retested with 0.1 ml. of a 1/100 dilution—that is, 100 T.U. The criterion adopted for the reading of these tests was that any reaction producing less than 5 mm. of induration, read at 48 hours after the injection, was regarded as negative. I administered and read the tests, as

it had been previously ascertained that no appreciable error was likely to arise through the qualitative reading of the tests by one experienced observer. Strong circumstantial evidence has also been presented, showing that the presence of bovine infection in the Rhondda Fach is unlikely to affect the results of a tuberculin survey as an index of total communal infection from human pulmonary sources (Jarman, 1953).

Results

Fig. 1 shows the results of tuberculin-testing in the Rhondda Fach in 1950-1 and in 1953. This figure is based on the testing of 2,828 children out of 4,265 over the age of 5 at school in 1950-1, and on the testing of 3,195 out of 4,614 over the age of 5 at school in 1953. The detailed numbers of children tested at various ages and the stages at which lapses occurred are shown in Table 1 (a) and (b). It has to be noted that neither the tuberculin-testing curve nor the actual numbers shown in Table I correspond exactly

FIG. 1.—Results of tuberculin-testing in the Rhondda Fach in 1950-1 and 1953.

TABLE I.—Results of Tuberculin-test of Schoolchildren, 1950-1 and 1953

Age in Years	Total of All Children	At School	Mantoux Lapses	No. Tested	Mantoux +	% Positive
(a) 1950-1						
5	386	384	143	241	31	12.9
6	405	403	133	270	34	12.6
7	407	407	107	300	53	17.7
8	391	390	95	295	41	13.9
9	386	386	112	274	67	24.5
10	398	397	122	275	74	26.9
11	379	377	87	290	87	30.0
12	420	419	132	287	102	35.5
13	375	364	151	213	77	36.2
14	443	423	168	255	97	38.0
15	435	191	120	71	27	38.0
16	404	91	55	36	20	55.6
17	383	33	12	21	13	61.9
Totals	5,212	4,265	1,437	2,828	723	25.6
(b) 1953						
5	451	448	142	306	16	5.2
6	496	493	145	348	18	5.2
7	516	515	119	396	33	8.3
8	378	378	77	301	45	15.0
9	396	395	91	304	44	14.5
10	403	401	86	315	50	15.9
11	385	382	95	287	44	15.3
12	386	383	126	257	66	25.7
13	386	385	133	252	76	30.2
14	370	360	148	212	73	34.4
15	405	310	167	143	61	42.7
16	371	88	47	41	16	39.0
17	419	76	43	33	11	33.3
Totals	5,362	4,614	1,419	3,195	553	17.3

to the previously published results for the tuberculin-testing done in 1950-1. The reason for this is that the present curves are based on ages calculated from year of birth, whereas the curve and numbers as previously published were based on the actual age of the children as given at the time of testing. Furthermore, the school population was not defined in the first survey as it has been for the re-survey. In the first survey all children attending schools in the Rhondda Fach were included in the study; in the second survey only those children were included who attended schools in the Rhondda Fach and lived in the defined area.

Fig. 2 shows the results of tuberculin-testing in the "control" valley in 1951 and retesting in 1954. Detailed numbers of the children tested at different age groups are given in

FIG. 2.—Results of tuberculin-testing in a "control" valley in 1951 and 1954.

TABLE II.—Results of Tuberculin-testing in "Control" Valley, 1951 and 1954

Age in Years	No. Tested	No. Positive	% Positive
(a) 1951			
5	96	4	4.2
6	83	8	9.6
7	112	14	12.5
8	115	15	13.0
9	104	20	19.2
10	139	28	20.1
11	179	53	29.6
12	232	62	26.7
13	225	68	30.2
14	203	79	38.9
15	111	58	52.3
16	58	14	24.1
17	26	12	46.2
Totals	1,683	435	25.8
(b) 1954			
5	82	4	3.7
6	66	6	10.6
7	79	6	7.6
8	79	7	9.7
9	93	13	14.0
10	84	11	13.1
11	117	29	25.6
12	252	72	29.0
13	252	93	36.9
14	248	90	36.7
15	119	41	34.5
16	64	30	46.9
17	41	25	61.0
Totals	1,576	427	27.0

TABLE III.—Standardized Percentage of Positive Tuberculin Reactors in the Four Surveys, Based on the Results for Children Aged 5 to 14 Inclusive

Survey	1st in R.F.	2nd in R.F.	1st in Control Valley	2nd in Control Valley
Standardized percentage positive..	24.6	18.4	20.2	18.2

Table II (a) and (b). Table III shows the standardized percentage of positive tuberculin reactors, aged 5 to 14, in the four surveys—that is, the original and follow-up surveys in the Rhondda Fach and the original and follow-up surveys in the control valley. Further reference is made to this table in the discussion.

Follow-up of Children Tested in 1950-1 and Retested in 1953-4

It was possible to follow up a fairly large sample of those tested in 1950-1 and to retest them in 1953 and 1954 in the Rhondda Fach and the control valley. Tables IV-VII summarize the results.

Perusal of these tables shows what an extremely difficult task it is to carry out, without an enormous lapse rate, a follow-up type of study which involves a procedure such as tuberculin-testing. In order to keep the tables as simple as possible the sources of the progressively increasing lapse affecting the school populations originally tested in 1950-1 have not been shown.* This lapse rate derives from children leaving school, leaving the area, and failing to complete the tests in the second survey.

It is evident from Tables IV-VII that a very small percentage of the children in the higher age groups were tested

TABLE IV.—*Tuberculin-testing of Schoolchildren—Rhondda Fach. Follow-up of Those Mantoux-negative in 1950-1*

Age in 1951	No. Negative 1950-1	No. Tested in Both Surveys	No. Converted Negative to Positive	% Conversion
4-	908	697	37	5.3
8-	865	571	42	7.4
12-15	523	124	8	6.4
Totals	2,296	1,392 (65%)	87	6.1

TABLE V.—*Tuberculin-testing of Schoolchildren—Rhondda Fach. Follow-up of Those Mantoux-positive in 1950-1*

Age in 1951	No. Positive 1950-1	No. Tested in Both Surveys	No. Reverted Positive to Negative	% Reversion
4-	131	94	18	19.1
8-	269	181	27	14.9
12-15	303	82	3	3.7
Totals	703	357 (50%)	48	13.4

TABLE VI.—*Skin-testing Results in Schoolchildren—Control Valley. Follow-up of Those Negative at Time of First Survey*

Age in 1951	No. Negative First Survey	No. Tested in Both Surveys	No. Converted Negative to Positive	% Conversion
4-	285	162	6	3.7
8-	561	291	28	9.1
12-15	308	93	6	6.3
Totals	1,154	546 (47.3%)	40	7.3

TABLE VII.—*Skin-testing Results in Schoolchildren—Control Valley, 1954. Follow-up of Those Positive at Time of First Survey*

Age in 1951	No. Positive First Survey	No. Tested in Both Surveys	No. Reverted Positive to Negative	% Reversion
4-	31	20	1	5.0
8-	159	88	2	2.3
12-15	220	69	1	1.4
Totals	410	177 (43.1%)	4	2.2

on both occasions. A pilot attempt to overcome this was made by sending a circular letter to the homes of a sample of those children who had left school but who still lived in the valley, explaining the importance of testing them a second time and offering them appointments for this purpose.

*Detailed figures relating to these lapses and the stages at which they occurred can be supplied by the author.

pose every evening for two weeks between the hours of 5 and 9 o'clock. The response was so poor—less than 5% of those circularized attended for the initial test, and many of those who did turn up failed to attend for the reading of the test—that an extended attempt to defeat the lapse problem in school-leavers was abandoned.

When the follow-up results from these two valleys are compared it will be seen that in the Rhondda Fach 65% of those between the ages of 4 and 15 who were Mantoux-negative in 1950-1 were retested in 1953 and 6% had converted from negative to positive. In the control valley 47% of those Mantoux-negative in the same age group in 1951 were retested in 1954 and 7% had converted. There appears, therefore, to be little difference in the overall conversion rate, as actually observed by follow-up and retesting, between the two valleys. Of those in this age group who were Mantoux-positive in the Rhondda Fach, however, 50% were retested and 13% had reverted to Mantoux-negative in 1953. In the control valley 43% of those Mantoux-positive in 1951 in this age group were retested, but only 2% had reverted to negative.

X-ray Follow-up of Schoolchildren who were Mantoux-tested and X-rayed in 1950-1, and X-rayed Again in 1953

Another follow-up study of interest was possible—namely, an x-ray follow-up of three groups of children—those who failed to have their tuberculin tests in 1950-1 but who were x-rayed and found to be radiologically free from tuberculosis; those who were Mantoux-negative and x-ray negative in 1950-1; and those who were Mantoux-positive and x-ray negative in 1950-1. The results of radiological examination of these three groups in 1953 are shown in Table VIII.

TABLE VIII.—*X-ray Follow-up of Schoolchildren*

			Radiological Attacks of P.T.					Morbidity		
Age 1/1/51	No.	No. X-rayed in 1953	None	Adult Type		Prim. Type		Observation Years	Cases	Annual Rate/1,000
				-ve	+ve	-ve	+ve			
(a) Mantoux Positive but X-ray Negative, 1950-1										
Under 5	20	18	18	—	—	—	—	1,640	7	4.3
5 - ..	223	208	206	—	—	1	1			
10 - ..	426	397	393	—	3	—	1			
15+ ..	63	33	32	1	—	—	—			
Totals	732	656	649	1	3	1	2			
(b) Mantoux-Negative and X-ray Negative, 1950-1										
Under 5	340	313	312	—	—	1	—	5,720	8	1.4
5 - ..	1,138	1,091	1,089	—	—	—	2			
10 - ..	879	825	821	3	1	—	—			
15+ ..	69	59	58	1	—	—	—			
Totals	2,426	2,288	2,280	4	1	1	2			
(c) Mantoux Lapses but X-ray Negative, 1950-1										
Under 5	303	286	286	—	—	—	—	3,340	2	0.6
5 - ..	456	427	427	—	—	—	—			
10 - ..	547	497	496	1	—	—	—			
15+ ..	158	126	125	—	—	—	1			
Totals	1,464	1,336	1,334	1	—	—	1			

Of the 656 children who were Mantoux-positive in 1950-1, 7 (1.1%) showed radiological evidence of pulmonary tuberculosis in 1953. Out of 2,288 who were Mantoux-negative in 1950-1, 8 (0.35%) showed radiological evidence of pulmonary tuberculosis in 1953. This is in rather unexpected contrast to those who were Mantoux-positive in 1950-1. Out of 1,336 children who failed to have their tuberculin tests in 1950-1 only 2 developed radiological pulmonary tuberculosis in 1953.

Discussion

The crude results of tuberculin-testing in a community free from bovine infection presumably reflect the degree to which sources of human infection—that is, total tuberculous

infectivity—exist in that community. Changes in the percentage of positive reactors at various age groups from year to year reflect changes in two processes occurring concurrently—namely, the rate of conversion from tuberculin-negative to tuberculin-positive, and the rate of reversion from tuberculin-positive to tuberculin-negative. The factors influencing Mantoux conversion have been widely and exhaustively discussed in the literature, but those affecting the waning and loss of tuberculin sensitization—that is, Mantoux reversion—have been less explored.

This subject is discussed, however, in considerable detail in the Prophit Tuberculosis Survey (Daniels *et al.*, 1948). The evidence presented in this admirable follow-up study suggests that loss of sensitivity and Mantoux reversion occurs least often in those groups with the highest degree of exposure; and the authors conclude, in respect of the evidence they present in their survey study, that “desensitization appears to be inversely related to exposure, to a degree that renders improbable any serious error by false reactions.” On the other hand, the same factors affect the conversion rate in the opposite direction—namely, that Mantoux conversion occurs most frequently in those groups with the highest degree of exposure.

When the crude results of tuberculin-testing in the Rhondda Fach and the control valley are compared it would appear that there has been a definite decline in the general level of tuberculin sensitization amongst the children tested in the Rhondda Fach, but that the decline in the control valley (Figs. 1 and 2) is of a less degree.

The comparison between actually observed conversion and reversion rates in the two valleys (Tables IV–VII) is of great interest, but the interpretation of the differences observed is beset with difficulties.

It will be noted that the conversion rates are similar in the two valleys, though the rate for the control valley is based on the retesting of only 47.3% of those negative in the first survey. When the reversion rates in the two valleys are compared it will be seen that, out of a 50% sample of those positive in 1950–1 who were retested in the Rhondda Fach, 13.4% had reverted to negative, whereas in the control valley out of a 43% sample of those positive in 1951 only 2.2% had reverted to negative.

The results of the prevalence of positive reactors at different ages and the data on conversion and reversion have been subjected to statistical analysis by Mr. R. G. Carpenter (University of Cambridge, Department of Human Ecology and University Health Service). In this analysis adjustments have been made for the difference in the period of time elapsing between the Rhondda Fach surveys and the two surveys in the control valley. When the percentage positive at each of the four surveys is standardized, the standardized rates (Table III) suggest that there is a small reduction of the number of positives in the control valley and a larger reduction in the Rhondda Fach. These rates are derived in a similar way to standardized death rates. Analysis confirms that the reduction in the Rhondda Fach is unlikely to be due to chance, while in the control valley it may be. Analysis also shows that the reduction in the Rhondda Fach is larger than in the control valley.

A similar analysis has been made of the conversion and reversion rates and a significance test has been carried out. The difference in the reversion rates for all ages taken together for the Rhondda Fach and the control valley appears to be just significant.

The statistical analysis of these results rests on the assumption that the sampling from the population is random. This cannot be asserted, as it is well known that sampling can be regarded as random only if it is definitely made so. However, all four surveys were carried out in much the same way—that is, on children in schools whose parents consented. It would therefore seem reasonable to suppose that the results of the statistical analysis are correct even with the small proportions and numbers of persons actually followed up. Though the data on conversion and reversion rates

should be regarded with caution, it would seem that a higher reversion rate rather than a lower conversion rate may be the main cause of the decline of the number of positive reactors in the Rhondda Fach, as compared with the control valley.

It should be mentioned that, though no detailed study has been done in relation to environmental factors and population density, the two valleys are typical mining valleys in the South Wales coalfield and would appear to be reasonably comparable in respect of these factors.

An unusual and unexpected finding is that shown in Table VIII. The morbidity rate in children originally Mantoux-negative and x-ray negative is 1.4, whereas the rate in children originally Mantoux-positive and x-ray negative is 4.3. The literature relative to this subject was extensively reviewed in the Prophit Survey (Daniels *et al.*, 1948), and almost all observers had demonstrated that the radiological attack rate was higher among those previously negative than in those Mantoux-positive. This was one of the main conclusions drawn in the Prophit Report. Three American observers reported findings which were not in accord with this (Myers and Harrington, 1934; Pope *et al.*, 1939; Stewart, 1940). These authors attributed these contrary findings to the very low degree of tuberculous infectivity in those areas in America from which these observations derived.

It can be reasonably argued that where tuberculous infectivity is very low new cases could arise as the result of delayed radiological manifestations in those already infected—that is, in Mantoux-positives—at an equal or even higher rate than the occurrence of similar manifestations in those not yet infected at all—that is, in Mantoux-negatives.

More recently Palmer and Shaw (1953), in following up 282,000 children and others, some of whom had B.C.G. and others not, found that by far the greatest proportion of new cases of tuberculosis occurred among those who had originally been Mantoux-positive.

It should be noted, however, that these originally Mantoux-positive cases were not classified radiologically. Nevertheless, the investigations being conducted by the American Public Health Service are worthy of the closest study, because three of them—those amongst the American Indian schoolchildren, Puerto Rican children, and Ohio mental patients—involve communities where tuberculous infectivity is likely to be high rather than low.

Summary

Schoolchildren in the Rhondda Fach and in a “control” valley were tuberculin-tested in 1950–1 and again in 1953–4.

A follow-up study on those tested in 1950–1 and retested in 1953–4 was carried out. The large “lapse” rate involved, especially in the higher age groups, reveals how difficult a follow-up study of this kind, involving a procedure such as tuberculin-testing, is among schoolchildren.

The crude results of tuberculin-testing on both occasions suggest that there has been a fall in tuberculin sensitization of the schoolchildren in the Rhondda Fach which is not revealed to the same extent in the results of retesting in the control valley. Statistical analysis shows that the fall in percentage found positive in the Rhondda Fach is unlikely to be due to chance, whereas in the control valley it may be.

The actually observed overall conversion rate for the period between the surveys is 6.1% for the Rhondda Fach and 7.3% for the control valley. The observed reversion rate is 13.4% for the Rhondda Fach and 2.2% for the control valley.

Expressed as annual rates these are: 2.4% and 2.4% for conversion and 5.4% and 0.7% for reversion,

respectively. Statistical analysis shows that the difference between reversion rates in the Rhondda Fach and those in the control valley is significant.

The morbidity rates amongst the schoolchildren originally tested in the Rhondda Fach in 1950-1 are 0.6 for those who were "lapses" for Mantoux-testing in 1950-1; 1.4 for those Mantoux-negative in 1950-1; and 4.3 for those Mantoux-positive in 1950-1. This is an unusual finding, and might possibly be related to reduction of tuberculous infectivity in the valley.

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INVESTIGATION AND TREATMENT OF SEPTIC ABORTION

BY

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With the advent of penicillin the treatment of puerperal infections underwent a profound revolution. Post-partum puerperal sepsis has now ceased to be a serious problem, and can usually be treated without removal of the patient to a special puerperal sepsis unit. Post-abortion sepsis, on the other hand, still presents diagnostic and therapeutic problems, and it is the purpose of this paper to review these in the light of our experiences of the past five years. This department may claim to be in a unique position to conduct such a review, as it is primarily intended for the treatment of septic cases.

Classification

A fundamental difficulty in the classification of cases of septic abortion arises from the fact that the uterus is not necessarily involved in the infective process. We have therefore classified the 995 cases occurring in the period under review into the following three groups:

Group 1.—Those with complete or incomplete abortion without uterine infection (421 cases).

Group 2.—Those with local uterine infection (482 cases).

Group 3.—Those with spread of infection to the uterine appendages, peritoneum, blood stream, or viscera (92 cases).

Criteria of Uterine Sepsis

The common criteria of uterine sepsis comprise: (1) general signs of infection, of which pyrexia and tachy-

cardia are the most important; (2) local signs such as tenderness and subinvolution of the uterus and alterations in the lochia; and (3) bacteriological and haematological findings. In our experience none of these are in themselves indisputable evidence of uterine infection. All may be present with infected retained products of conception, and often only after evacuation of the latter can a definite assessment be made. We estimate the relative reliability of these individual criteria as follows.

Pyrexia

Elevation of temperature is traditionally regarded, in Britain at least, as the most reliable general sign of infection, and provides the basis of the definition of the notifiable state of puerperal pyrexia. During the period under review a change was made in this definition, presumably to conform with changing conditions and the ever-increasing emphasis laid upon the need for prompt notification and treatment. Whereas prior to August 1, 1951, the notification of puerperal pyrexia required that, in patients within 21 days of childbirth or miscarriage, a temperature of 100.4° F. (38° C.) should have been maintained for 24 hours or have recurred during that period, subsequent to that date it has been sufficient grounds for notification that the patient, within 14 days of childbirth or miscarriage, should have developed a temperature of 100.4° F. (38° C.). This elimination of the 24-hour qualifying period had the effect of trebling the number of notifiable cases in England and Wales per week, but gave even less indication than before of the incidence of true uterine infection. Attention has already been drawn to the present unsatisfactory position (Gordon, 1951; Calman and Gibson, 1953).

Our experience has shown that both inevitable and incomplete abortions may be accompanied by considerable degrees of pyrexia without demonstrable uterine infection. Fig. 1 shows the chart of a case of inevitable abortion in which not only a temperature of 103° F. (39.4° C.) but also a leucocytosis of 48,000 occurred; yet bacteriological examination was negative, and, following the spontaneous expulsion of the uterine contents, recovery was immediate and uneventful without chemotherapy.

Similarly, many cases of incomplete abortion show degrees of pyrexia which render them notifiable, but in which either spontaneous or assisted evacuation of the uterine contents

FIG. 1.—Inevitable abortion. Negative cultures from cervix, urine, and blood. Pyrexial until the day of abortion (August 3, 1946), and leucocytosis increased to 48,000 on that day. Immediate and uneventful recovery without chemotherapy.

FIG. 2.—Notifiable puerperal pyrexia accompanying incomplete abortion. No evidence of uterine sepsis. Persistent pyrexia until retained products were removed. Then uneventful recovery without chemotherapy.