bleeding of varying severity. The 7 of whom particulars follow required further treatment.

A. B., aged 35, was treated in August, 1926, with 10 mg. element applied for forty-eight hours; she had severe recurrence, and hysterectomy was carried out in another hospital.

C. D., aged 29, was treated in January, 1929, with 50 mg. for seventy-two hours; she had a severe recurrence, and hysterectomy was carried out in July, 1929.

E. F., aged 37, was treated in January, 1929, with 49 mg. for ninety-six hours; she had severe recurrence, and hysterectomy was carried out in October, 1929.

G. H., aged 33, was treated in June, 1926, with 50 mg. element for ninety-six hours, and in May, 1927, she was treated for recurrence by means of x rays. Since then she has had amenorrhoea, except for some bleeding in August and September, 1929.

I. K., aged 44, was treated in May, 1927, with 50 mg. element for seventy-two hours; a recurrence was treated in September, 1927, with the same dose, and since then the patient has had amenorrhoea.

L. M., aged 38, was treated in April, 1928, with 50 mg. for seventy-two hours. In January, 1929, a recurrence was treated with the same dose, and since then the patient has had amenorrhoea.

N. O., aged 40, was treated in December, 1927, with 50 mg. element for fifty-two hours. A recurrence was treated in May, 1928, with 50 mg. element for forty-eight hours; since then she has had occasional bleeding, but diminishing in amount.

The after-history of the remaining 43 is as follows: 5 had slight bleeding immediately following the treatment; 25 within the first two months, and 3 within three to six months; 7 had occasional bleeding from six to eighteen months after treatment. In these 40 cases bleeding has now stopped. In 2 cases treated in 1928 with 50 mg. element for seventy-two hours bleeding still occurs at irregular intervals, but no further treatment has been carried out. The remaining case was treated in December, 1925, for dysmenorrhoea with 50 mg. element for seventy-two hours. There was some bleeding from January to March, 1926, and then amenorrhoea till January, 1929. Since then periods have occurred, not excessive in amount, at the normal rhythm of twenty-eight days; dysmenorrhoea has disappeared.

Question B.

This question was answered by 93 patients; of these 76 say they feel better, 3 that they feel worse, and 10 that their condition is unchanged. No definite conclusion could be derived from 4.

Question C.

This question was answered by 93 patients, but on the whole the answers were vague. It seems clear that of 77 who have had flushes 62 still have them, and of the remaining 15, 6 state that the flushes have ceased, and 9 have failed to answer this part of the question. In the 6 cases from which this symptom has disappeared the flushes persisted after treatment for a period ranging from six months to three years.

Question D.

The purport of this question does not seem to have been quite clear to the patients, but 52 state that they have had sweats, and 39 that they have had none; the remainder give indefinite answers. The average duration of sweats appears to have been five to ten minutes, but there are no data about their frequency.

Question E.

Of those who give definite answers to this question, 59 state that they have suffered from depression, and 32 that they have not. Only 21 attempted to answer the second part of the question, and of these 8 state that the depression lasted for periods varying between one and twelve months after treatment, 2 that it lasted for two years, 4 that it lasted for three years, 5 that depression is experienced occasionally, and 2 that it is experienced frequently.

Question F.

Definite answers were received from 75 patients, 43 of whom claim to have been more cheerful, 22 more irritable, more depressed, or both, and 10 unchanged in spirits since the operation.

Question G.

Answers were received from 79 patients, of whom 46 have gained weight, 18 have lost weight, and 15 said that their weight is unchanged.

Question H.

To this question there were 91 definite replies; 52 patients said that they have had pain since the operation, 39 that they have not; of the former, 27 state that the pain has been in the lower abdomen, lower part of the back, or groins, 19 that it has been in the head, arms, chest, etc., and 6 are vague on the subject.

Question I.

To this question the replies of 40 of the patients were irrelevant, as they were spinsters, widows, or others who for some reason had had no sexual relations since treatment. Of the remainder, 31 stated that their relations were unaltered, 8 that they had lost inclination, 7 that they suffered from dyspareunia, and 2 that they bled after coitus; 5 were indefinite.

Question K.

To this question the answers are necessarily varied; 41 complain of discharge, though many of these state that the discharge only lasted for a short time after treatment; 41 complain of indigestion, 54 of headache, and 54 of nerves. None have become pregnant.

ANALYSIS OF RESULTS.

It will be seen that from the point of view of the production of amenorrhoea the treatment has been satisfactory, but it is worth while analysing the nine cases in which the initial dose of radium failed to bring about a cure. In this group six of the patients were under 40, one was 40, and two were between 40 and 50. Only one of the six under 40 had received a small dose—namely, 480 mg. hours, the remainder receiving 3,600 mg. hours or over. The patient aged 40 received 2,600 mg. hours, and the other two 3,600 each. Estimating failures as a percentage of patients within the same age group it will be seen that 35.3 per cent. of failures occurred in the cases under 40, and 3.75 per cent. in the cases over 40. The series is too small to generalize from, but the figures accord with the view that the younger the patient is the more resistant are her organs likely to be to the effects of radium.

The fact that 77 of the patients complain of flushes, 52 of sweats, 59 of depression, 54 of headaches, and 54 of nerves, suggests that menopausal symptoms are prominent sequels of the treatment. In spite of these menopausal symptoms, however, 76 of the patients said that they are better, 10 that they feel just the same, and only 3 that they are worse. Although a large proportion complain of pain, one cannot say how much of this is due to the treatment, or even if the pain was present or not before the treatment.

PNEUMONOCOONIOSIS DUE TO FLUE DUST.

BY

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THE special interest of the following details turns on the fact that we have been unable to trace a similar case in medical literature.

A post-mortem examination was performed on a man, aged 35 at the time of his death. Between the ages of 14 and 25 he had been employed as a riveter in a boiler works. For the subsequent nine and a half years he had been a boiler cleaner, an occupation which included flue cleaning.

There was no family history of tuberculosis, and except for an attack of pneumonia in 1917, and again in 1918 (probably influenzal), and an attack of influenza in December, 1929, his previous health had been good. In May, 1930, his teeth were extracted for pyorrhoea. On July 1st he complained of hoarseness and lassitude, and ceased work. At the beginning of August he was placed under the care of the district tuberculosis officer. Up to August 11th his sputum had been examined for tubercle bacilli on six occasions with negative results, but it was found positive on five subsequent occasions.

An x -ray examination on August 13th revealed scattered mottling throughout both lungs, especially dense on the left, and the view expressed by the tuberculosis officer was

that the appearance was suggestive of advanced silicosis. The patient died on September 5th, and a necropsy was performed on the next day.

Macroscopical Appearances.

There were dense pleural adhesions on both sides of the chest. The right lung was almost coal-black in colour; small, hard nodules were found along its anterior border and throughout its substance. Several small cavities were present at the apex; they were smooth-walled, and surrounded by dense fibrous tissue. The lung generally was fibrosed, and small scattered areas of broncho-pneumonia were visible. The left lung was voluminous, heavy, and dark grey in colour. Small, hard nodules were present throughout its substance, which was markedly fibrosed. At the apex were several small cavities with thick walls. The rest of the lung was the seat of extensive broncho-pneumonia.

The bronchial glands were enlarged, black in colour, but not very hard. The heart muscle was pale and soft, and the mitral valve was sclerosed and incompetent. The liver was in the condition of chronic passive congestion with fatty change.

Microscopical Appearances.

Both lungs showed the condition of well-marked pneumoconiosis with extensive areas of fibrosis and obliteration of the smaller bronchi and vessels. There was an excessive amount of dust in the fibrotic areas, and dust cells were present in large numbers throughout the sections. The alveolar walls were fibrosed and thickened, and contained dust deposits and dust cells. Caseation was occurring in some of the fibrotic areas, certain of which showed giant cells and an atypical picture of tuberculosis. In the right lung small areas of broncho-pneumonia were present. The histological appearance of the left lung differed only in degree from that of the right. The fibrosis was more marked, and the broncho-pneumonia, which was undoubtedly of tuberculous origin, was very much more extensive. The bronchial glands showed some fibrosis, and fine dust particles were scattered throughout the sections.

Portions of the lungs were digested with trypsin, and the mineral matter was examined microscopically. In addition to an excessive quantity of fine granular dust, much of which was carbonaceous, large dark angular particles were seen, and also flat mica-like and small transparent crystalline particles of silica or silicates, which ranged in size from the order of the ultra-microscopic to 60 or more microns in length. Some of the mica and crystalline particles were coloured red from the presence of iron. Under the polarizing microscope the mica and silica particles were seen to be doubly refracting. Similar particles were present in the flue dust in which the patient had worked. Sections of both lungs and of the bronchial glands showed, under the polarizing microscope, a large number of doubly refracting particles, presumably silica or silicates.

From the history and the examination of the lungs there can be little doubt but that the pneumoconiosis preceded the tuberculous infection by many years.

Chemical Considerations.

Chemical analysis of the lungs, boiler scale, and flue dust were made by Mr. T. H. Byrom, F.I.C. The following tables indicate the components in 100 grams of the dried material.

	Left Lung.		Right Lung.	
	Grams.	Percentage of Ash.	Grams.	Percentage of Ash.
Insoluble siliceous matter ...	0.142	3.63	0.178	3.56
Soluble siliceous matter ...	0.181	3.86	0.156	3.12
Total siliceous matter ...	0.320	6.89	0.334	6.68
Ferric oxide ...	0.120	2.56	0.453	9.00
Alumina ...	0.430	9.18	0.430	8.60
Phosphoric anhydride ...	0.380	8.12	0.546	10.92
Calcium oxide ...	0.017	0.36	0.025	0.50
Magnesium oxide ...	0.030	0.64	0.042	0.84
Sulphuric anhydride ...	0.070	1.50	0.073	1.46
Alkalis ...	3.320	70.75	3.100	62.00
	4.690	100.00	5.000	100.00

	Boiler Scale.	Flue Dust.
	Per cent.	Per cent.
Insoluble siliceous matter ...	6.40	26.40
Soluble siliceous matter ...	3.90	6.00
Total siliceous matter ...	10.30	32.40
Ferric oxide ...	3.42	27.17
Alumina ...	1.68	14.12
Calcium sulphate ...	57.13	21.14
Calcium carbonate ...	3.60	Trace
Magnesium hydrate ...	17.80	3.18*
Combined water ...	4.60	Nil
Carbonaceous matter ...	1.00	Nil
Phosphoric anhydride ...	0.074	0.16
		2.5.†

* Magnesium oxide.

† Ferrous oxide.

The insoluble siliceous matter in the flue dust contains, in addition to quartz grains, many acicular crystals and flat plates, both transparent and opaque, probably of micaceous and feldspathic origin, derived from the shale and other inorganic material from which the flue dust has been formed. The occupation of boiler cleaner where Lancashire boilers are used includes flue cleaning. The latter is by far the more dusty part of the work, and was undoubtedly the primary cause of the pneumoconiosis.

It is of interest to note that three boiler cleaners are employed at the particular colliery at which the deceased worked. During the past twelve years twenty-seven men have been employed, and have given up the work; of these, two are known to have died—one the subject of this communication, and another the cause of whose death is unknown. One worked only one day, and another one week. Excluding these four, the average duration of employment was fifteen months. Including the two dead, the average period of work was twenty months. The deceased man had worked the longest period, 113 months, the nearest approaching that time being thirty-six months. There is, however, a man still employed who has been at the work for sixty-two months.

TECHNIQUE IN ENDOTRACHEAL ANAESTHESIA.*

BY

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Not many years ago the administration of an endotracheal anaesthetic was outside the routine of the operating theatre. Its introduction excited such interest as would be accorded to the performance of an unusual or difficult operation. It is not improbable, perhaps, that the procedure was at first regarded as an unnecessary complication. Doubtless also the patience of many a surgeon has been sorely tried on a busy operating day by the first attempts of his anaesthetist.

Within recent years the advantages of the method have become widely known. Surgeons are increasingly anxious to avail themselves of these advantages, and many expert anaesthetists in England now employ the method as a routine for operations which formerly involved many anaesthetic difficulties.

Nevertheless, in some hospitals endotracheal anaesthesia is not available when required; in others, the results compare unfavourably with those obtained by older and more orthodox methods. Since the method can no longer be considered new—and if we grant that it has advantages—it is apparent that there must be some drawbacks to its unqualified employment.

* A paper read in opening a discussion in the Section of Anaesthesia at the Annual Meeting of the British Medical Association, Winnipeg, 1930.