Measures to control infection and relieve bronchospasm are the essentials of treatment. The value and dangers of oxygen therapy are pointed out and the lethal effect of morphine is stressed.

REFERENCES

- Aslett, E. A., Hart, P. d'A., and McMichael, J. (1939). *Proc. roy. Soc. B.* **126**, 502.
- Baldwin, E. de F., Cournand, A., and Richards, D. W. (1948). *Medicine*. **27**, 243.
- (1949). *Ibid.*, **28**, 201.
- Bloomfield, R. A., Lauson, H. D., Cournand, A., Breed, E. S., and Richards, D. W. (1946). *J. clin. Invest.*, **25**, 639.
- Brock, R. C. (1948). *Thorax*, **3**, 88.
- Christie, R. V. (1934). *J. clin. Invest.*, **13**, 295.
- (1939). *Edinb. med. J.*, **46**, 463.
- (1944a). *British Medical Journal*, **1**, 105.
- (1944b). *Ibid.*, **1**, 143.
- and McIntosh, C. A. (1934). *J. clin. Invest.*, **13**, 279.
- Cournand, A., and Richards, D. W. (1941). *Amer. Rev. Tuberc.*, **44**, 26.
- and Darling, R. C. (1939). *Ibid.*, **40**, 487.
- Daley, R. (1945). *Brit. Heart J.*, **7**, 101.
- Davies, C. E., and Mackinnon, J. (1949). *Lancet*, **2**, 883.
- Donald, K. W. (1949). *Ibid.*, **2**, 1056.
- Dunlop, D. M., Henderson, T. L., and Inch, R. S. (1952). *British Medical Journal*, **1**, 292.
- Gilson, J. C., and Hugh-Jones, P. (1949). *Clin. Sci.*, **7**, 185.
- Harvey, R. M., Ferrer, M. I., Richards, D. W., and Cournand, A. (1951). *Amer. J. med.*, **10**, 719.
- Herxheimer H. (1946). *British Medical Journal*, **1**, 350.
- Hurtado, A., and Boller, C. (1933). *J. clin. Invest.*, **12**, 793.
- and Fray, W. W. (1933). *Ibid.*, **12**, 807.
- and McCann, W. S. (1933). *Ibid.*, **12**, 833.
- Kaltreider, N. L., Fray, W. W., Brooks, W. D. W., and McCann, W. S. (1934). *Ibid.*, **13**, 1027.
- Kaltreider, N. L., Fray, W. W., and Hyde, H. van Z. (1938). *Amer. Rev. Tuberc.*, **37**, 662.
- Lilienthal, J. L., Jun., Riley, R. L., Proemmel, D. D., and Franke, R. E. (1946). *Amer. J. Physiol.*, **147**, 199.
- McMichael, J. (1939-42). *Clin. Sci.*, **4**, 167.
- (1948). *British Medical Journal*, **2**, 927.
- and Lennox, B. (1949). *Lancet*, **2**, 1057.
- and Sharpey-Schafer, E. P. (1944). *Quart. J. Med.*, **13**, 123.
- Meakins, J. C., and Christie, R. V. (1929-30). *Ann. intern. Med.*, **3**, 423.
- (1934). *J. Amer. med. Ass.*, **103**, 384.
- Motley, H. L., Cournand, A., Werko, L., Himmelstein, A., and Dresdale, D. (1947). *Amer. J. Physiol.*, **150**, 315.
- Simpson, T. (1948). *British Medical Journal*, **2**, 639.
- (1949). *Lancet*, **2**, 1057.
- Whitfield, A. G. W., Arnott, W. M., and Waterhouse, J. A. H. (1950). *Quart. J. Med.*, **19**, 319.
- (1951a). *Ibid.*, **20**, 141.
- (1951b). *Lancet*, **1**, 490.
- Smith, O. E., Richards, D. G. B., Waterhouse, J. A. H., and Arnott, W. M. (1951). *Quart. J. Med.*, **20**, 247.
- Waterhouse, J. A. H., and Arnott, W. M. (1950). *Brit. J. soc. Med.*, **4**, 113.

INCIDENCE AND NATURE OF PUERPERAL PSYCHIATRIC ILLNESS

BY

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Many writers have expressed the view that no form of psychiatric illness occurring in pregnancy or the puerperium is a specific clinical entity. The general opinion seems to be that the ordinary stress and strains of pregnancy, operating in predisposed individuals, produce non-specific mental illnesses which are indistinguishable from other mental reactions and are due to the interaction of factors—the pregnancy being of psychological importance only. Brew and Seidenberg (1950) state that these disorders occur only in predisposed individuals, and disregard the possibility that a physiological or endocrine disturbance may be the primary activating factor.

As other surveys have been made only on patients who have been admitted to mental hospitals these conclusions are not justified; and as no psychiatric survey of women confined in maternity hospitals has been undertaken there is no evidence about the importance of alleged psychogenic factors.

The question has been considered afresh by studying the case records of all the women delivered at maternity

hospitals in Bristol between January, 1938, and June, 1948, a period of 10½ years, the cases numbering about 37,000. Physical and psychological factors were noted in order to ascertain their importance. The incidence, nature, and outcome of mental reactions were studied, and all cases of mental illness related to the puerperium or pregnancy that were treated in Bristol Mental Hospitals during the same period were examined by me; thus there was a double check and control. The tables relate to these surveys. Reference has also been made to some other cases, which were not included in the surveys as they occurred in other years or outside Bristol.

This appears to be the first double survey made, although a report of the Rotunda Hospital, Dublin (quoted by Noyes, 1948) refers to 81 cases of unspecified psychiatric illness in 54,000 confinements.

In Bristol, about half the total number of pregnant women were confined in Southmead Hospital and Bristol Maternity Hospital, the remainder at home or in nursing-homes. Probably all the cases that required in-patient psychiatric treatment were admitted to the Bristol Mental Hospitals. The survey, therefore, is an almost exact record of the incidence of serious and prolonged puerperal mental illness in Bristol from 1938 to 1948.

In all cases included in this study there was a considerable degree of mental unbalance (such as depression or mania, clouding of consciousness, delirium, or thought disorder). Slight emotionalism and sleeplessness that cleared up in a few days were noted so frequently in the case histories that they cannot be regarded as important or even abnormal, and these were disregarded. Mental complications during pregnancy, occurring before confinement, were very rare, and unless otherwise stated the figures apply to puerperal mental illness only.

Incidence of Puerperal Reactions

During the 10½ years under survey 81,000 women were confined in Bristol, and 116 (1.4 per 1,000) of these were admitted to the Bristol Mental Hospitals. Approximately 37,000 were confined in the two maternity hospitals and 44,000 elsewhere. Mental illness was noted in 64 of the 37,000 (1.7 per 1,000), but in 27 of these it cleared up quickly, and only 37 (1 per 1,000) required mental-hospital treatment. Of the 44,000 women confined at home or in nursing-homes, 79 (1.8 per 1,000) were admitted to the mental hospitals.

Thus the incidence of mental illness was practically the same in both categories; but the incidence of admission to a mental hospital was greater in the case of women confined at home, probably because it is impossible to cope with even slight degrees of mental illness at the puerperium in the average house or flat. The maternity hospital cases that required mental-hospital treatment represent the more nuclear type of mental illness, not subject to quick remission.

Diagnostic Categories and Distribution

The cases were classified as follows: (1) manic-depressive psychosis; (2) puerperal depression; (3) schizophrenia; (4) mixed schizophrenic states; (5) neurosis; (6) confusion and exhaustion; (7) toxic delirium; and (8) other conditions (Tables I and II).

To facilitate evaluation of various factors they have also been reclassified as follows: (1) affective (including manic-depressive cases and puerperal depression); (2) schizophrenic (including mixed schizophrenic cases); and (3) other cases.

In the maternity hospital series nearly all cases in the schizophrenic group and the majority in the affective group required mental-hospital treatment, as these represented true

TABLE I.—*Distribution of Maternity Hospital Cases*

Diagnosis	No. of Cases	No. Admitted to Mental Hospital
Manic-depressive: manic, 0; depressive, 5	5	3
Puerperal depression	20	12
Schizophrenia	8	7
Mixed schizophrenia	4	4
Neurosis	4	1
Confusion and exhaustion	5	2
Toxic delirium	13	7
Others	5	1
	64	37

TABLE II.—*Distribution of Mental Hospital Cases*

Diagnosis	No. of Cases	Results
Manic-depressive: manic, 8; depressive, 14	22	All recovered
Puerperal depression	44	1 committed suicide. Remainder recovered
Schizophrenia	19	1 improved All recovered
Mixed schizophrenia	5	" "
Neurosis	6	" "
Confusion and exhaustion	5	" "
Toxic delirium	14	4 died. Remainder recovered
Others	1	Recovered
	116	

psychotic illnesses likely to be prolonged. But only half the toxic and confused cases could not be managed adequately in the maternity hospitals, and these cases were rare towards the end of the period, probably because of the use of modern drugs (sulphonamides, penicillin, and the like) and improved obstetric practice.

Aetiological Factors

Number of Pregnancies.—There is no evidence that primiparae are particularly susceptible, except in schizophrenia, as the following figures show.

	Primiparae	Multiparae
Mental hospital cases:		
Mania and depression	30	36
Schizophrenia	14	10
Others	13	13
Maternity hospital cases:		
Mania and depression	10	15
Schizophrenia	9	3
Others	13	14

It was not uncommon to find psychotic illness following a second or third pregnancy, with no recurrence in subsequent pregnancies. In one case recurrent depressive illnesses occurred after the second pregnancy and each of three subsequent pregnancies. But on the whole there was no particular correlation, and—except possibly in schizophrenia—it is difficult to forecast subsequent attacks of puerperal illness.

Previous Mental Illnesses.—Among the 116 cases of the mental-hospital series the previous puerperal mental illnesses noted were:

Schizophrenia	1 out of 19
Manic-depressive cases	4 " " 22
Puerperal depression	3 " " 44

Other previous mental illnesses, not associated with childbirth, were:

Mixed schizophrenia	1 out of 5
Manic-depressive cases	5 " " 22
Puerperal depression	1 " " 44

These figures together give a total of 15 out of 116 cases with previous mental illness, or about 13%. Previous mental illness has been recorded where there was a history of treatment in a mental hospital or nervous illness of severity treated at home. In primiparae previous attacks of nervous exhaustion, not amounting to nervous breakdown, which seemed to have little effect on working capacity or function, were often reported; no doubt such a history indicates an over-solicitous individual anxious not to conceal anything of importance, and no significance can be attached to this

alone. In some cases, not included in this series, a periodic affective illness developed after childbirth, with subsequent attacks related to menstruation.

Family History.—A history of mental illness in near relatives was obtained in 17 cases out of 116 (about 14.5%), as follows:

Schizophrenia	4 out of 19	} 6 out of 24
Mixed schizophrenia	2 " " 5	
Manic-depressive	2 " " 22	
Puerperal depression	8 " " 44	
Toxic states	1 " " 14	

Although family history in the psychoses is considerable, and in the schizophrenic group represents 25% of all the cases, a history of mental illness in the family was noted in many women confined without mental complications.

Age.—Mental reactions occurred during the whole child-bearing period without predilection. Older women do not seem to be particularly vulnerable.

Multiple Births.—Among the 81,745 babies born in Bristol during this period there was one case of quadruplets as well as twins and triplets. Mental reactions were observed in only one case of multiple births, twins, the mother developing puerperal schizophrenia. It can be concluded that there is no predisposition in multiple births in spite of the obvious psychological factors involved.

Physical Illnesses.—It was striking how resistant pregnant women were to physical illness. The survey showed that in spite of serious diseases (rheumatism, heart disease, disseminated sclerosis, diabetes, and others) patients were successfully confined, and even if exhausted there was no prolonged mental breakdown. Many epileptics were confined during this period; in some there were no fits during gestation or the puerperium, and any relationship between epileptic fits and child-bearing seems to be inverse.

Psychological Factors.—The war covered half the period under review. During this time there was every combination of bad social conditions—psychological trauma, separation from husband, illegitimacy, bereavement, bombing, and housing difficulties. None of these factors, alone or together, appeared to exercise an important influence on the development of mental illness, and it is not possible to ascribe importance to psychological factors, apart from the personality of the patient and the family history. Karnosh and Hope (1937) suggested that there was an increased incidence due to external factors such as unemployment in the U.S.A. between 1927 and 1936, but Brew and Seidenberg (1950) noticed a drop during the war years in spite of the exceptional circumstances.

Personality.—The personality of patients admitted to the mental hospitals has been studied with care. Those who suffered from mixed schizophrenic reactions and puerperal depression were usually dependent, over-anxious, obsessional, and rigid in type. They looked forward to having a baby, but the character pattern of earlier life became much emphasized after the child was born, and, especially in puerperal depression, the personality structure resembled closely what is seen in involutional melancholia. Neurotic reactions were sometimes associated with immaturity, backwardness or even a degree of mental deficiency, or psychopathic personality. These personality types have been observed by other workers (Brew and Seidenberg, 1950).

Diagnostic Classification

All writers have had difficulty in classifying pregnancy reactions, and this may account for the great discrepancies in their incidence according to different surveys. The difficulty seems to be created by the special characteristics of some pregnancy reactions, and it is obviously unsound to force patients into a diagnostic category in order to prove that these are, or are not, specific to child-bearing. The present survey should help to clear up the situation.

Delirium and mental reactions to exhaustion and toxæmia following childbirth are becoming rare, but they are not different from those observed in other circumstances. True

manic-depressive episodes do not differ in characteristics or course from those not related to pregnancy, nor is the personality structure of the patient different.

In my opinion, there is a psychiatric entity—puerperal depression—which differs from the manic-depressive psychosis, and in many ways resembles involutional melancholia. The personality, as has been mentioned, is rigid and restricted, in contrast to that of the manic-depressive cases.

This illness, like puerperal schizophrenia, makes its appearance within the first fortnight after delivery, sometimes in the first week. In addition to depression, indecision, and lack of concentration, ideas of guilt and unworthiness are prominent, often with an abnormal attitude to bodily functions. There may be loss of interest in or rejection of the child, or the fear—sometimes realized—that it may be harmed. Motor agitation is prominent, and there is often great anxiety lest the compulsion to commit suicide or to injure the child may be obeyed.

The condition is extremely intractable even when treated by convulsion therapy, and if untreated may persist for a year or more after confinement. Eventual recovery or spontaneous remission is usual.

Schizophrenic reactions occur either as an acute schizophrenic illness, appearing in the first few days after confinement, with delusions, hallucinations, sometimes katatonic stupor, and irrational impulsive behaviour, or as a mixed psychosis with schizophrenic elements and marked affective disturbances, which are more often depressive, with ideas of guilt, though occasionally a maniacal picture is seen.

In the cases of mixed psychosis hallucinations are common, and in mixed depressive cases usually take the form of accusing or threatening voices. Visual hallucinations seem more prominent where there has been a difficult labour with loss of blood, physical illness, or perineal damage.

Treatment

Electric convulsion therapy is generally used in an affective psychosis as soon as the puerperal state permits. It is effective in puerperal depression and puerperal mixed schizophrenia; but the response is neither so good nor so certain as in non-puerperal affective illnesses. Relapses are common, and the illness is sometimes very prolonged. There is a certain danger of embolism if E.C.T. is given within a few weeks of delivery. Insulin treatment in addition to E.C.T. is usually necessary in mixed schizophrenia, and is normally tried in puerperal schizophrenia.

There are a certain number of reports of treatment of puerperal reactions with progesterone and other hormones (Blumberg and Billig, 1942; Schmidt, 1943). Experience at the Bristol Mental Hospitals shows that empirical hormone therapy is likely to be successful and that the most careful endocrine investigation and analysis should be carried out before any hormone treatment is attempted. This ideal is difficult to realize in puerperal cases, especially those suffering from schizophrenia, who are notoriously uncooperative and changeable. Nevertheless, hormone therapy applied on the endocrine findings and results of analysis has produced or assisted in producing remissions in some Bristol cases. In one case of mixed schizophrenia improvement could be correlated with changes in the hormone equilibrium of thyroid and adrenals, and the patient made a spontaneous remission at a time when the hormone investigations gave normal results.

It is as yet too early to say more than that there are indications that hormone therapy may be successful in puerperal reactions.

Response to Treatment.—In the series of 116 cases (Table II), 1 patient with puerperal depression committed suicide, 4 patients with toxic delirium died, and 18 out of 19 schizophrenics failed to improve. The remainder recovered eventually. In common with some other writers (Cruickshank, 1940), I have found the prognosis in schizophrenia to be practically hopeless, for in spite of early treatment only 1

out of 19 cases improved significantly. In mixed schizophrenia and in the affective psychoses (manic-depressive and puerperal depression) the response to electric-shock treatment was disappointing; although all these cases recovered eventually, relapses were common.

Addendum

A further series of 24 cases examined since 1948 has been analysed for comparison with the main series. The general conclusions are in agreement (Table III).

TABLE III.—*Second Series. Mental Hospital Cases*

Manic-depressive	..	..	..	..	..	2
Puerperal depression	..	..	..	..	..	13
Schizophrenia	..	..	..	..	..	3
Mixed schizophrenia	..	..	..	..	..	4
Neurosis	..	..	..	..	..	2
						<hr/> 24

Discussion

Investigation of the case histories of 37,000 women confined in Bristol maternity hospitals from 1938 to 1948 has failed to substantiate the assumption that psychological factors operating in predisposed individuals are responsible for puerperal mental illnesses. On the contrary, pregnant and puerperal women seem to be particularly resistant to the stresses and strains of life usually regarded as important in the production of neurotic and psychotic illness.

The majority of 140 cases of puerperal mental illness studied in two series of 116 and 24 were of puerperal depression and puerperal schizophrenia. In this paper the term puerperal schizophrenia excludes cases of mixed affective psychosis than the true schizophrenia. Puerperal depression and puerperal schizophrenia seem to be clinical entities causally related to the confinement, for psychiatric symptoms appear acutely within a few days of the event. As a general rule there is no indication of impending psychotic illness until after the child is born, and the patients look forward to the confinement and make adequate preparations for the baby.

There are points of resemblance between puerperal depression and involutional melancholia. The personality type and symptomatology are similar, and each illness follows an endocrine event and is prolonged.

Puerperal schizophrenia, which also appears soon after delivery, differs from other schizophrenia in several respects. Contrary to ordinary prognostic criteria, it is practically incurable. A good prognosis in schizophrenia is based on the rapidity with which treatment is given, the pre-psychotic personality, and the absence of endocrine abnormality. These factors should be in the patient's favour in puerperal schizophrenia; the personality is optimum—patients are sociable, have made good contacts and married; they are fertile and there are no obvious endocrine abnormalities; treatment is instituted more rapidly than in other kinds of schizophrenia, as these patients are invariably placed in a mental hospital within a few days of the onset.

Schizophrenia occurring during gestation is rare, and authors seem to agree that it is incurable. Patients suffering from chronic non-puerperal schizophrenia have been known to become pregnant and to be delivered of healthy babies without influencing the psychosis for the worse—sometimes for the better.

The acute alteration in the physiological and endocrine state associated with childbirth, operating on a susceptible personality or psychobiological organism, appears to activate these two grave psychiatric reactions—puerperal depression and puerperal schizophrenia. Vulnerability or predisposition is suggested by the positive family history ascertained in 25% of cases of schizophrenia in the survey.

The slow recovery and generally disappointing response to E.C.T. and insulin treatment in puerperal psychoses points to some serious endocrine imbalance; for there is much evidence that shock treatments operate through their effect

upon the endocrine equilibrium, affecting notably the adrenal cortex and thyroid (Hoagland *et al.*, 1950; Reiss *et al.*, 1951a, 1951b).

Changes in the uterine endometrium have been correlated with clinical improvement in some cases of puerperal psychosis (Delay *et al.*, 1947).

In many animals the placenta is eaten, and in some species if the placenta is taken away from the mother, as after caesarean section, she shows no interest in the offspring or maternal instincts. It may be that the sudden deprivation of the placenta with its hormone content produces a disturbance in the endocrine equilibrium, which, working on a predisposed constitution, produces the mental illness. Thus research on pathophysiological lines may provide the answer to the aetiology and treatment.

The question of terminating pregnancy to prevent another puerperal illness may arise, for mental illness is one of the most serious complications of pregnancy. At the very least it disturbs the mother-child relationship, disrupts the home, and makes a terrible start to family life. Admission to hospital is usually necessary, and shock treatment cannot be started early without the danger of embolism.

Normally there is no case for terminating pregnancy merely because a patient has had a puerperal psychosis. A history of a brief mental illness after confinement indicates that this was a neurotic illness and not a puerperal psychosis, and can probably be disregarded. In my opinion, termination should be considered seriously if less than a year has elapsed since recovery from a puerperal psychosis which ran a prolonged course and if there is also a bad family history of mental illness, and especially when there is in addition a history of more than one attack of puerperal psychosis.

It seems to be extremely dangerous for a patient who has recovered from puerperal schizophrenia to become pregnant again. The prognosis in this condition is so bad that another pregnancy can rarely occur, though it may happen in mixed schizophrenia. The only such case known to me had developed schizophrenia after the birth of twins. She was treated for about six months with electric shock and insulin, and was discharged improved. Shortly afterwards she became pregnant again, and there were mental changes. Pregnancy was therefore terminated by surgical induction. She again developed puerperal schizophrenia, was readmitted to hospital, and now—three years afterwards—has failed to show any improvement in spite of treatment.

Appropriate antenatal care can do much to reduce psychoneurotic and mild nervous reactions, especially in primiparae, but so far there appears to be nothing that can be done to prevent puerperal depression or puerperal schizophrenia.

Attacks of periodic depression may occur by coincidence during gestation. These respond to electric-shock treatment, which can be given in the early stages of pregnancy. In other cases the patient may have to be cared for in a mental hospital. She should be transferred to a maternity hospital for the confinement, to avoid the stigma on the child of having been born in a mental hospital; thereafter, the course of the illness is not usually different from that of ordinary depression.

Perhaps the most striking fact that has emerged from this survey is the way in which pregnancy seems to insulate and protect women from psychological and social stresses and strains of the greatest severity.

Summary

A psychiatric study of 37,000 women delivered in maternity hospitals in Bristol between 1938 and 1948, and of 140 cases of puerperal mental illness treated in Bristol Mental Hospitals in about the same period, has been made.

The incidence of mental reactions in the maternity hospital cases was 1.7 per 1,000, of which 1 per 1,000

required to be admitted to the mental hospital. The incidence of mental illness in the total number of women delivered in Bristol (81,000) was 1.4 per 1,000.

The distribution of different kinds of mental reactions has been noted. Apart from mixed schizophrenia and other affective and neurotic reactions, there appear to be two psychiatric disease entities causally related to child-bearing—puerperal depression and puerperal schizophrenia. Puerperal schizophrenia, in spite of favourable prognostic criteria, is rarely curable. Puerperal depression has some characteristics of involutional melancholia.

In schizophrenic reactions there was a positive family history of mental illness in about 25%. There seems to be a characteristic personality structure in puerperal depression. There are grounds for supposing that an endocrine condition is of causal importance in some puerperal psychoses.

Psychological stresses, physical illness, age, number of pregnancies, and multiple births were of no significance in the production of mental reactions.

Certain problems relating to the aetiology, management, and treatment of puerperal mental illness have been considered, and the importance of research into the endocrinology of the condition has been emphasized.

I wish to express my thanks to Dr. B. M. Murphy, who has helped me in the maternity hospital surveys; to the obstetricians at Southmead Hospital and Bristol Maternity Hospital for their co-operation and for allowing me to study their case records; and to the Records Departments at these hospitals for much assistance.

REFERENCES

- Blumberg, A., and Billig, O. (1942). *Psychiat. Quart.*, **16**, 454.
 Brew, M. F., and Seidenberg, R. (1950). *J. nerv. ment. Dis.*, **111**, 408.
 Cruickshank, W. H. (1940). *Canad. med. Ass. J.*, **43**, 571.
 Delay, J., Cortel, A., and Boittelle, G. (1947). *Ann. Endocr., Paris*, **8**, 447.
 Hoagland, H., Callaway, E., Elmadjian, F., and Pincus, G. (1950). *Psychosom. Med.*, **12**, 73.
 Karnosh, L. J., and Hope, J. M. (1937). *Amer. J. Psychiat.*, **94**, 537.
 Noyes, A. P. (1948). *Modern Clinical Psychiatry*, 3rd ed., p. 44. Philadelphia.
 Reiss, M., Hemphill, R. E., Maggs, R., Haigh, C. P., and Reiss, J. M. (1951a). *British Medical Journal*, **2**, 634.
 ———, ———, Smith, S., Haigh, C. P., and Reiss, J. M. (1951b). *Ibid.*, **1**, 1181.
 Schmidt, H. J. (1943). *J. Amer. med. Ass.*, **121**, 190.

Comparatively few Glasgow graduates proceed to industrial careers, according to Professor A. K. Cairncross, professor of applied economics, Glasgow University, writing in the *Glasgow Herald* of November 24. His conclusions are based on a sample of 300 graduates from the registers of the University for 1922 and 1952 and a sample of 100 from the register of 1868. A hundred years ago there were about 2,000 Glasgow graduates; now there are over 30,000. The overwhelming proportion have always entered one of the learned professions. Less than a century ago one in two became a minister of religion. By 1922 doctors led the field, with teachers in second place and ministers third, but now the doctors have been outnumbered by the teachers. The 1952 sample of graduates is made up of 94 teachers, 51 married women, 48 doctors, 27 engineers, 14 ministers, 10 university teachers, 8 lawyers, 7 chemists, and 41 others. The figures for doctors are worth closer examination. In 1868, for every three medical graduates who practised in Scotland four practised elsewhere; in 1922 those who practised in Scotland were easily in the majority; but by 1952 the proportion was back again to what it had been in 1868. Many medical students in the latter year came to Glasgow from other parts of the British Isles with every intention of leaving after qualification. In 1952 there were actually fewer Glasgow-trained doctors in Scotland than in 1922.