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INDICATIONS FOR THERAPEUTIC ABORTION*

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Therapeutic abortion is such a popular subject for discussion that it appears every few years on the agenda of meetings of bodies such as the British Medical Association and the Royal Society of Medicine, and is the basis of much writing. Yet opinion and practice in this country, based as they are on the Hippocratic tradition, on ethics dictated by public opinion, and on the Offences against the Person Act (1861), have not changed in principle for at least 100 years. One of the difficulties in assessing the value of therapeutic abortion to the patient, and therefore its indications, is a lack of factual knowledge. Controlled observations are impracticable, and the outcome for the patient if abortion had not been induced in one case, or if it had been induced in a second case, can never be known with certainty. Any conclusions can rarely be more than opinions, and those articles which purport to give facts are inevitably coloured to a greater or less extent by the religious, ethical, and personal convictions of the writer. This communication is no exception.

The destruction of a living embryo offends something fundamental in human nature, and the most scientifically detached gynaecologist cannot fail to approach an operation of therapeutic abortion with an uneasiness which has been variously credited to "primordial revulsion" (Arkle, 1957) and "subtle archaic motives" (Pearce, 1957). Even the onlookers subconsciously rebel, and, as the pregnancy sac is removed, the surgeon "can feel the shudder of the theatre staff" (Nixon, 1957). It is the entry of individual personal feelings, prejudices, and ethical standards which largely accounts for wide variations in the reported frequency of therapeutic abortion. Other important factors are the educational status and financial prosperity of the community from which cases are selected. In New York City, for example, there are, in proportion to live births, five times as many therapeutic abortions in private hospitals as in municipal hospitals (Gebhard *et al.*, 1959). According to the literature, reviewed by Anderson (1957) and Gebhard *et al.* (1959), the incidence of therapeutic abortion in the hospitals in this country and the U.S.A. varies from 1:35 to 1:16,750 of all births.

During the 10 years 1949-58, in private and hospital practice as conducted by me and my assistants in the Liverpool Maternity Hospital, Mill Road Maternity Hospital, and the gynaecological department at the Liverpool Royal Infirmary, therapeutic abortion was performed 63 times. This figure excludes induction of abortion for ectopic pregnancy, hydatidiform mole,

missed abortion, and all conditions in which the foetus was dead or abortion inevitable.† There was also, during the same period, an unrecorded number of cases (probably not more than 10) in which abortion was advised by us but refused by the patient. Out of five women known to be in the last category one died six days, and a second 18 months, after delivery; two, including one of those who died, lost their baby.

The series of 63 cases was drawn from a total number of approximately 40,000 new patients, 28,000 of whom were pregnant. This gives an incidence of rather more than 2 therapeutic abortions per 1,000 pregnant women examined. The abortion cases were, however, selected, partly by sifting at general-practitioner level and partly because they included many specifically referred from associated special clinics concerned with cardiac disease, pulmonary tuberculosis, and the like. The most unselected material was seen at Mill Road Maternity Hospital, where, among 18,094 pregnant women examined by my staff, therapeutic abortion was carried out 14 times, four times at the request of a physician in charge of a special clinic. If these four are excluded, the incidence of therapeutic abortion among the ordinary clientele of hospital antenatal clinics serving a poor-class community with inferior general health was 0.7 per 1,000 maternities. If they are included the incidence was 0.8 per 1,000 maternities. According to this personal experience, the need for therapeutic abortion is nowadays probably not higher than 1 per 1,000 pregnancies. Acceptance of this conclusion means that any one general practitioner who, in England and Wales, is unlikely on average to have more than 40 pregnant women in his practice in any one year, can expect to meet an indication for therapeutic abortion only once in 25 years. His problem is not those cases in which termination of pregnancy is justified, but the far more numerous ones in which it is demanded or discussed. The general physician, the chest physician, the cardiologist, and the psychiatrist encounter this problem rather more frequently. Their particular difficulty is that, when pregnancy occurs in one of their patients already embarrassed by some physical or mental defect, their first and natural reaction is to conclude that removal of the pregnancy would simplify the situation. Their concern may even lead them to go so far as to inform the patient that abortion must be induced, without first consulting the gynaecologist who is expected not only to perform the operation but also to accept legal responsibility. The difficulty

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†In two cases the foetus was found to be already dead at the time of hysterotomy, but these are included because the operation was planned in the belief that the pregnancy was alive.

which results if the gynaecologist then takes an opposite view has two basic roots:

1. The specialist in any branch of medicine, though an expert in his field, usually has little first-hand knowledge of how the patient with organic or functional disease reacts to pregnancy and labour. He rarely appreciates the resilience of women, and especially of pregnant women, in the face of stress. How often does a cardiologist see his patients during labour? How many psychiatrists, having expressed an opinion, follow their patients through pregnancy, labour (or therapeutic abortion), and afterwards?

2. It is not enough to decide that pregnancy is likely to have an adverse physical or mental effect in any case; it has to be shown that the continuance of the pregnancy will be more harmful than therapeutic abortion. Here again those specializing in spheres other than obstetrics and gynaecology generally have little concept of the hazards of terminating pregnancy, and tend to think that it means no more than a simple "D and C" as performed for menorrhagia and dysmenorrhoea, or the evacuation of an incomplete abortion. In fact, therapeutic abortion is a potentially dangerous operation, and can, in many circumstances, offer far more risks than pregnancy and labour.

Hazards of Therapeutic Abortion

Physical Ill-effects

The difficulty in safely terminating a secure and live pregnancy is illustrated by the fact that there is no general agreement on the most satisfactory method. Achievement of the objective always means some surgical intervention. In the very early weeks of pregnancy this may involve forcible dilatation or incision of the cervix with piecemeal and blind evacuation of the products of conception. After the tenth week the choice usually lies between abdominal hysterotomy and the insertion into the uterus of some physical or chemical irritant. The dangers involved can be appreciated by studying the results in those countries where abortion is legally and frequently induced for eugenic and humanitarian reasons. This means that in the majority of such cases the operation is performed on women who are physically and mentally fit.

On such material primary mortality rates as high as 1.7 to 3.5 per 1,000 for therapeutic abortion, and 3.5 to 5.5 per 1,000 for combined therapeutic abortion and sterilization are reported from Sweden (Sjövall, 1951; Westman, 1955). In Denmark, the primary mortality for all cases was once 2 per 1,000 (Oram, 1952), but the most recent statistics suggest that the risk is being reduced. Thus, in their own clinic, Berthelsen and Østergaard (1959a) say there were no deaths associated with 1,235 abortions induced during the years 1953-7. Nevertheless, in Denmark as a whole and during the same period, 23,666 therapeutic abortions with 16 fatalities (0.7 per 1,000) were notified to the national health service (Berthelsen and Østergaard, 1959b). In both these recent series the morbidity rates were high, at least 5% when pregnancy was terminated before the 10th week and 15% after the 10th week. In the Danish national series non-fatal but serious illness resulted after 584 out of 18,346 vaginal operations (3.2%); there were 82 cases of perforation of the uterus, and 122 cases of salpingitis, peritonitis, and septicaemia. In addition, 113 cases of non-fatal serious complications followed 5,320 abdominal hysterotomies (2.1%).

Here, then, is the picture when abortion is carried out on relatively healthy women; what is the outcome when the woman is judged to be so ill as to be incapable of tolerating pregnancy? Women suffering from cardiac,

respiratory, and renal incompetence are obvious surgical risks, and when therapeutic abortion is restricted mainly to their type of patient a primary mortality rate of 1% is not unlikely. In fact, among the 63 cases reported here there were no fatalities, but one woman came near to death from pulmonary embolism. Five patients in all became seriously ill (embolism two; ileus one; wound breakdown two), and many took several weeks to recover.

The hazards to life and health are not confined to the immediate post-operative period. Many women whose pregnancy is terminated without apparent complication suffer subclinical infection which renders them permanently sterile. According to Gebhard *et al.* (1959), this risk is often exaggerated, and they quote from the European literature to show that the incidence of sterility is not higher than 1 or 2%. Gynaecologists dealing with cases of infertility are nevertheless aware that it is quite common to see women suffering from tubal obstruction after induced abortion. If this happens when a first pregnancy is interrupted for a non-recurrent indication, such as rubella or a fleeting psychological upset, the situation is tragic.

The type of risk incurred with therapeutic abortion varies not only with the general health of a patient but also with the duration of her pregnancy and the method of its termination. The Danish figures suggest that, whereas abdominal hysterotomy is more often fatal (mostly from embolism), vaginal operations such as curettage, with or without the previous injection of an abortifacient paste, are more often accompanied by non-fatal serious illness due to injury, haemorrhage, and infection. In our series the methods used for therapeutic abortion were:

Dilatation and curettage		1 case
Laminaria tents followed by curettage		1 "
Abdominal hysterectomy		2 cases
Abdominal hysterotomy		59 "

The abdominal route was chosen in nearly all cases because: (a) The indication for therapeutic abortion often called for sterilization as well. Tubal resection was performed in all except five women treated by hysterotomy. (b) Late diagnosis of pregnancy, accompanied by the need for careful consideration and consultation, meant that only four pregnancies were less than 10 weeks in duration when interrupted. Vaginal operations for terminating relatively advanced pregnancies are notoriously fraught with danger. (c) Abortifacient pastes, though possibly having a place, are unpopular in this country because they nearly always have to be followed by curettage, and because their use is not uncommonly complicated by haemorrhage, infection, and general systemic catastrophes (Weilerstein, 1944).

Psychological Ill-effects

Women are so constituted that, even though not wishing to have another child, they generally regret losing one which is already developing in the uterus. If, as in the case of deliberately induced abortion, they themselves play a part in the decision to sacrifice the embryo, they are liable to have lifelong regrets. When women are mentally unstable, and when the indication for therapeutic abortion is more flimsy, as is likely when psychiatric and social factors enter the picture, their peace of mind may be permanently shattered. There is evidence, quoted by Pearce (1957) and Martin (1958), that termination of pregnancy in such circumstances leaves 25 to 59% of the women with remorse and

feelings of guilt. In other circumstances the figure may not be so high, but it is nevertheless significant. Gebhard *et al.* (1959) found evidence of prolonged psychiatric trauma in 9% of a sample of American women who had had abortion induced therapeutically or criminally.

Indications for Therapeutic Abortion

According to English law and its interpretation by the courts, it may not be unlawful to interrupt a pregnancy which would otherwise, in the opinion of the medical attendant, constitute a threat to the life of the woman or which would make her a "physical or mental wreck." The opinion must be honest though not necessarily correct. This implies a wide variety of possible reasons for therapeutic abortion.

Indications for Therapeutic Abortion

Indication	1949-53	1954-8	Total
Heart disease	12	9	21
Pulmonary tuberculosis	10	1	11
Chronic hypertension and allied disease	4	6	10
Renal disease and incompetence	2	4	6
Previous carcinoma mammae	—	4	4
Psychoses and neuroses	3	1	4
Pulmonary incompetence	—	1	1
Carcinoma cervix	—	1	1
Placenta praevia	—	1	1
Potential foetal abnormality	—	4	4
	31	32	63

The Table shows the main indication present in each of the 63 cases under review. Often more than one factor was present. Thus, one of the cases classified as having a psychiatric indication concerned a 7-gravida, aged 35, who was suffering from "depressive psychosis and neurasthenia," a condition which made it difficult to care for her large family and which was being made worse by the prospect of having still one more child to rear. In addition, however, the patient had had one kidney previously removed for pyonephrosis, and her social and domestic circumstances were of the poorest.

Economic and social factors are never in themselves legally and ethically acceptable as justifying therapeutic abortion in this country, yet, because of their impact on health and disease, they cannot always be disregarded as secondary factors. A patient with severe valvular disease of the heart may well tolerate a first pregnancy when she has no responsibilities which interfere with her having adequate rest, and when her social circumstances are good. A similar degree of cardiac embarrassment occurring in a woman who cannot rest because of having three small children to manage unaided in an unsatisfactory home might, however, constitute an urgent indication for therapeutic abortion. In the past, allied considerations often determined interruption of early pregnancy because of pulmonary tuberculosis. Even after it became generally recognized that this disease is not usually made worse by pregnancy (Robinson, 1931; Stewart and Simmonds, 1947), the immediate institution of the best treatment available often demanded termination of the pregnancy.

Heart Disease

In the area from which this series of cases is drawn, heart disease, generally of rheumatic origin, is common. It remains, as shown during the last five years of the period under review, the leading indication for therapeutic abortion, and this despite a progressive improvement in the general health of the population and despite the developments in cardiac surgery. Indeed, in

two out of the last nine cases, valvotomy had previously been performed, but the improvement in cardiac function had proved to be only temporary.

Heart disease is a leading cause of death of pregnant women. Out of 1,410 analysed maternal deaths occurring in England and Wales during the three years 1952-4, 316 were caused by "associated diseases," and cardiac lesions account for 121 of these (Ministry of Health, 1957). The exact place of therapeutic abortion in the treatment of heart disease complicated by pregnancy is difficult to compute, but most obstetricians would probably agree with Sutherland *et al.* (1955) that it is at present indicated in approximately 1% of cases.

Because of the difficulty of foretelling how well an untreated heart will tolerate pregnancy, and because the patient can have proper rest and care, therapeutic abortion is rarely indicated in a primigravida suffering from a cardiac disability. This does not mean that the first pregnancy is not potentially dangerous; indeed, approximately 50% of the 121 deaths from heart disease mentioned above occurred among primigravidae. However, even if therapeutic abortion were considered medically desirable most women with cardiac disability would insist on their right to attempt at least one pregnancy. In our series there was only one case in which a first pregnancy was terminated, and this patient was desperately ill and suffering from auricular fibrillation. A second patient with heart disease had previously had one abortion only, and her pregnancy was interrupted only after advice given by three independent cardiologists from two cities. Of the multigravidae, five had fibrillation at the onset of pregnancy and nine had a clear history of heart failure in a previous pregnancy or earlier in the pregnancy under consideration. The remainder showed varying degrees of cardiac embarrassment. It is here relevant to emphasize the long-accepted rule that therapeutic abortion is dangerous when heart failure is present. Its indication is a past history of failure, with subsequent recovery of reasonable efficiency.

Pulmonary Tuberculosis

The introduction of efficient antibiotic therapy for pulmonary tuberculosis quickly altered the place of therapeutic abortion in cases of this disease. The figures in the Table merely illustrate what must be a general experience. They show that out of a total of 11 operations for this indication, only one was performed in the last five years. In that case, pregnancy was terminated not so much for active phthisis as for the fact that one lung was already completely collapsed and the patient suffered considerable respiratory embarrassment. The present-day infrequency of the need for therapeutic abortion for pulmonary tuberculosis is emphasized by the Joint Paediatric and Obstetric Committee of the Joint Tuberculosis Council (1958), and, according to this committee, the only circumstances which may constitute an indication are: (1) a serious impairment of pulmonary function by the disease; (2) a patient's adverse psychiatric reaction to the prospect of pregnancy in association with phthisis; and (3) the inability of a multiparous woman to undertake the care of still one more child without breakdown in the control of her disease.

Pulmonary Incompetence

Whereas the last two of the above indications are debatable and not necessarily acceptable, the first is one

which deserves attention. Until recently, pulmonary insufficiency was barely recognized as an indication for therapeutic abortion. The advent of radical lung surgery, however, has introduced a new problem for the obstetricians. Most women can tolerate pregnancy well despite removal of one lung (Williams, 1957), but if they have less than the equivalent of one lung the further embarrassment of respiration caused by late pregnancy and labour can be fatal. This type of problem is seen not only as a result of surgery and of extensive bilateral disease. It also arises in cases of severe kyphoscoliosis affecting the mid-thoracic spine (Dewhurst, 1953). It was this type of deformity, complicated by bronchiectasis, which determined therapeutic abortion in the one case mentioned in this series. It may be added that during the period under review there were, in one of the hospitals from which this series is drawn, two maternal deaths* from cardio-respiratory failure which resulted from previous pneumonectomy in one case and dorsal kyphoscoliosis in the other. Another patient, with widespread bilateral active tuberculosis and very little pulmonary reserve (vital capacity 1,300 ml.), who refused therapeutic abortion, only just survived the respiratory stress of the late pregnancy and labour.

It is difficult to assess pulmonary function and reserve. Safe labour is said to require a vital capacity of at least 1,500 ml., but, according to Williams (1957), clinical observation is a better guide than any such mathematical calculation.

Chronic Hypertension

The reaction of the hypertensive woman to pregnancy is again a matter difficult to predict. Many physicians and obstetricians take a gloomy view of the association, yet, as noted by nearly all speakers at a recent symposium on the subject (Morris and Browne, 1958), it is remarkable how many women start pregnancy with a systolic pressure of more than 160 mm. Hg and a diastolic pressure of more than 90–100 mm. Hg and produce a live healthy baby without any serious mishap or permanent deterioration in their condition. Others, on the other hand, often with a lesser degree of hypertension, may be at serious risk, and so may their babies. In our cases the decision to terminate pregnancy was determined not by the particular height of the blood-pressure but by the past obstetrical history. Therapeutic abortion was mostly reserved for those women whose condition had reacted adversely in past pregnancies and in whom the hypertension appeared to have been the cause of previous antepartum haemorrhage or recurrent abortion and stillbirth.

Renal Incompetence

A history of nephrectomy was not accepted as an indication for therapeutic abortion provided that the one kidney showed evidence of good function. The patients classified as suffering from renal incompetence had lesions such as bilateral hydronephrosis, bilateral resistant pyelonephritis, chronic nephritis with hypertension and nitrogen retention, and tuberculosis of one remaining kidney.

Certain women with chronic nephritis tolerate pregnancy surprisingly well, and, without shortening their life-span, have the satisfaction of producing well-developed healthy babies. They are generally those

whose renal disease is not accompanied by hypertension or who do not develop hypertension before the thirtieth week of pregnancy (Wilson, in Morris and Browne, 1958). The immediate prognosis is often better than is generally realized, and may not be much improved by interrupting the pregnancy. In nephritis more than any other disease the question arises, If pregnancy kills, will abortion save? Two cases seen in recent years illustrate the problem.

A primigravida with normal blood-pressure was found, at the twelfth week of pregnancy, to have some form of chronic nephritis. The physician strongly advised termination of the pregnancy; the patient, supported by the obstetrician, refused to accept the advice. Despite some deterioration in her condition towards the end of pregnancy, this woman secured the baby which she desired. The mother's life was not shortened; it was made happy for two years. Thereafter a baby was left motherless.

The second patient, also primigravid, was known to suffer from bilateral renal hypoplasia with renal rickets and azotaemia. Her life hung by a thread even before pregnancy. Both physician and obstetrician recommended therapeutic abortion, but the patient refused to agree. The baby died *in utero* at the thirty-third week of pregnancy, and the mother died six hours after an easy premature labour. Would therapeutic abortion have done more than fill this woman's last few remaining months of life with remorse?

Present or Past History of Cancer

Since it became recognized that certain cancers, especially those of the breast, are hormone-dependent and therefore likely to be stimulated by the steroids circulating during pregnancy, the presence or past history of malignant disease is regarded as a possible indication for therapeutic abortion. Cancer of the breast, uterus, and skin certainly tends to grow rapidly during pregnancy, but whether this is due to hormone and vascular changes, or whether it merely reflects the youth of the patient, remains uncertain. During the period studied abortion was induced four times because of a past history of carcinoma mammae, but, at the request of the patient, one pregnancy was allowed to proceed in similar circumstances. A second patient with untreated cancer also went to term. The fact that neither of these women came to obvious harm illustrates that cancer does not inevitably get worse or recur during pregnancy, and is not always a clear indication for therapeutic abortion. Thompson (1954) described a consecutive series of 10 cases in which malignant disease of various types had previously been treated and none suffered ill effects from pregnancy. Ten patients subjected to vulvectomy for carcinoma of the vulva have, in recent years, survived subsequent pregnancy without recurrence of the growth (A. A. Gemmell, 1959, personal communication).

Obstetrical Indications

It is noteworthy that among the 63 cases listed there was only one in which a disease specifically related to pregnancy called for therapeutic abortion. This was an unusual example of placenta praevia in which recurrent and uncontrollable bleeding ultimately necessitated abdominal hysterotomy. In the past, obstetrical indications for inducing abortion were many and

*In a near-by hospital and within the last year another woman, previously subjected to pneumonectomy, died from pulmonary insufficiency in late pregnancy.

varied; there was a time when even contracted pelvis was accepted as an indication. Whitehouse (1932) reported that 52 out of a series of 352 (14%) therapeutic abortions were performed because of hyperemesis gravidarum. So changed is the face of medicine that pregnancy has not once been terminated for this condition in my unit since 1942. This and other abnormalities of pregnancy and labour, while still remaining an occasional indication for therapeutic abortion, can nearly always be treated successfully by other means.

Psychiatric Indications

After surveying world opinion and practice, Robinson (1933) long ago showed that therapeutic abortion is rarely justified for frank psychoses, even those which begin during pregnancy. But since the court ruling in the case of *Rex v. Bourne* in 1938, and with the modern emphasis on psychological medicine, many pregnancies have been terminated for personality disorders: so many that there is widespread fear that "psychiatric indications" are sometimes abused to support the termination of unwanted pregnancies. And if psychiatrists find that gynaecologists often resist their requests to carry out therapeutic abortion, the explanation is that they themselves are not agreed that such requests are justified. This was well illustrated at a meeting of the Psychiatric Section of the Royal Society of Medicine in London in February, 1957, a meeting which the *British Medical Journal* (1957) reported as being "distinguished by the complete lack of agreement."

Some psychiatrists take the view that psychoses, or even the history of such during and after a previous pregnancy, rarely if ever call for therapeutic abortion: equally eminent authorities say that, whereas neuroses never justify terminating pregnancy, certain psychoses may do so. The literature (reviewed by Pearce, 1957; Anderson, 1957; and Arkle, 1957) abounds with opinions, and sometimes figures, in support of diametrically opposed views. Because of differing views and beliefs among psychiatrists and obstetricians, and because the acute anxiety state, possibly accompanied by a threat of suicide, induced by an unwanted pregnancy is regarded as significant by one physician and not by another, psychiatric disorders comprise 40% of the indications for therapeutic abortion in one hospital and 0% in another. Nixon (1957) reported 509 cases in which pregnancy was terminated during 19 years (1938-57) at University College Hospital, London. A psychiatric indication was present in 39%. The comparable figure from St. Mary's Hospital, Manchester (Anderson, 1957), was 12.5%, whereas in the small group reported here it was 4 out of 63 cases (6%).

Anderson (1957) reported on 49 pregnant women with psychological disorders. Seventeen had abortion induced, and 11 of these were followed up; only one (the victim of rape) was obviously benefited. Of the 32 cases in which the pregnancy was allowed to progress, 24 were available for adequate study. Pregnancy went to term in 19 of these women, and 12 suffered no further psychological upset; in the remainder the mental state showed no significant improvement or deterioration, though Anderson comments that therapeutic abortion might have helped three of them. Arkle (1957) described 22 cases of psychiatric disorders in association with pregnancy, and none came to harm through not having abortion induced.

If all the evidence is taken into consideration it is difficult not to conclude that few neurotic or psychotic women are ever benefited by termination of pregnancy and that these are difficult to select. Even a clear past history of puerperal insanity on one or more occasions is not an indication for therapeutic abortion, partly on psychiatric grounds (Ekblad, 1955; Martin, 1958), and partly because this disorder is just as likely to follow abortion as delivery at term (Polonio and Figueiredo, 1955; White *et al.*, 1957). Sometimes the medical attendant cannot help worrying lest a refusal to induce abortion will result in a woman carrying out her threat to commit suicide. It is an aspect of the problem on which records appear to be scarce, but, such as there are, they suggest that it is rare for such a threat to be executed. The woman who takes her life because of an unwanted pregnancy is most often one who has not taken medical advice.

Therapeutic Abortion for Potential Foetal Abnormality

The Committee on Medical Aspects of Abortion (1936), appointed by the British Medical Association to consider this question, issued a report which is remarkable for the following statement: "Whilst under existing conditions reasons based on eugenic considerations are generally regarded by medical men as falling outside the scope of therapeutic abortion, the committee believes that there are certain cases of this class which constitute justifiable indications . . . when there is reasonable certainty that serious disease will be transmitted to the child." The examples given include hereditary blood disorders, certified mental deficiency in both parents or in one parent and one previous child of the union, and certified mental deficiency in two previous offspring. This conclusion was reached despite the fact that the Law did not, and does not, recognize eugenic indications for inducing abortion; and it is of interest that the Council of the British Medical Association did no more than regard "the report as a contribution of great practical value" and hoped that it would receive "careful attention."

To-day the main interest in what might be regarded as eugenic aspects of therapeutic abortion is not concerned with inherited mental disorders so much as with foetal injury and disease resulting from adverse agents operating during early intrauterine life. In Denmark, abortion is already being induced when a pregnant woman has inadvertently been exposed to x rays. Hammer-Jacobsen (1959) reported 11 such cases and expressed the view that when a woman less than 16 weeks pregnant is exposed to more than 10 r therapeutic abortion is always indicated; when the dose is between 1 and 10 r the operation may or may not be permissible; when the exposure is less than 1 r the foetal risk is such as not to justify terminating pregnancy. Despite a widespread scare about radiation hazards, this attitude has fortunately not yet developed in this country. Here the adverse agents acting on the foetus which cause most concern are maternal virus infections and maternal antibodies to foetal blood factors.

With regard to virus infections other than rubella it was at one time suggested that they subjected the foetus less than 12 weeks old to a 20% risk of malformation (Grönvall and Selander, 1948; Kaye *et al.*, 1953). More carefully controlled observations (Hill *et al.*, 1958; Siegel and Greenberg, 1959; Caughey, 1959; Hesseltine, 1959) have so far failed

to confirm this, and, for the present, it must be concluded that there is no evidence to show that diseases such as measles, chicken-pox, herpes zoster, mumps, scarlet fever, poliomyelitis, and infective hepatitis significantly distort foetal development, even when contracted by the mother early in pregnancy. The position in regard to influenza is uncertain.* The risk of rubella, however, is real; the only difficulty is to assess its extent and whether it justifies therapeutic abortion in individual cases.

When a foetus is exposed to the rubella virus before the twelfth week it may be killed and aborted. If not, the chance of its eyes, ears, brain, or heart being malformed was initially put at 80%—100% for the first two months and 50% for the third month (Gregg, 1945, 1946; Swan *et al.*, 1943, 1946). This estimate was based on a retrospective study of babies born to mothers during a virulent epidemic of rubella amongst a susceptible community in Australia. Because of these and similar reports many women contracting rubella in early pregnancy have been treated by therapeutic abortion (Wesselhoeft, 1949; Greenberg *et al.*, 1957), and this practice has seriously interfered with the conduct of controlled prospective statistical studies. Another difficulty encountered in such studies is the possibility of variations in risk according to time, place, and community — variations which may reflect differences in virulence of the infection on the one hand and host susceptibility on the other. There is also the uncertainty of the diagnosis of rubella in the mother and of deafness in the young baby. To make matters worse it is possible (Lundström, 1952) that unrecognized viraemia in a mother immunized by an attack of rubella in earlier life can sometimes be just as dangerous to the foetus as can obvious disease in a susceptible woman.

In so far as any firm conclusions on sublethal effects are possible, the most recent reports from this country (*Lancet*, 1957; Hill *et al.*, 1958; Jackson and Fisch, 1958), from Canada (Oxorn, 1959), from Eire (Coffey and Jessop, 1959), from the U.S.A. (Greenberg *et al.*, 1957), and even from Australia (Pitt, 1959) suggest that: (1) Rubella contracted after the twelfth week† of pregnancy is virtually harmless to the foetus. By that time the basic development of vulnerable organs is complete. (2) When rubella is contracted before the twelfth week the overall risk of foetal malformation is between 10 and 30%, with an average of 20%. This danger may be as high as 50% during the first month, falling to 25% in the second and to 10–15% in the third.

This background and these figures do not permit the general conclusion, as is suggested by Bell (1959), that therapeutic abortion should be induced in every case in which a woman acquires rubella during the first three months of pregnancy. They do, however, suggest a need to consider this operation in individual cases, the nature of the advice offered being ultimately decided by the circumstances of the particular case—the duration of pregnancy, the woman's age, parity, fertility, and the like. Unfortunately, the severity of the clinical manifestation of rubella in any woman is an unreliable

guide; the foetus can be affected by viraemia which produces negligible clinical manifestations.

Even when two or more medical opinions are in favour, and when the potential parents agree, there is at first sight no legal justification for therapeutic abortion on account of a rubella hazard to the foetus. The operation only becomes acceptable by showing that the prospect of foetal malformation is causing the expectant mother so much worry that her health is being adversely affected. The pregnancy is thus interrupted on a maternal psychiatric indication rather than in the interests of the foetus. A similar approach is reasonable when it is impossible to allay the fears of the outcome of pregnancy in a woman who already has given birth to two or more physically or mentally abnormal children. In the present series there were four cases in which therapeutic abortion was carried out because of an unfavourable maternal reaction to a high expectation of foetal abnormality. In one the cause of the worry was rubella contracted at the fifth week of pregnancy. In a second the mother had already had three babies, all apparently normal, but all dying within 24 hours of birth for a reason which could not be determined despite the most careful investigation. When contraception failed at the age of 43 years, the patient was so distressed at the idea of having still one more heart-rending experience that the pregnancy was terminated and she was sterilized.

Rhesus incompatibility prompted therapeutic abortion in the remaining two cases. Both women had had two or more affected stillborn babies, and their husbands were homozygous rhesus-positive. In this sort of circumstance the hazard to the mother is not only psychological but can be physical, a fact which is not always appreciated. The risk to maternal health and life arises mainly if the foetus reacts to iso-immunization by becoming hydropic. When this happens there is a 50% chance of severe pre-eclampsia, and, even without this, a high chance of abruptio placentae (Scott, 1958; Jeffcoate and Scott, 1959). The development of hypofibrinogenaemia at the time of delivery is another complication of iso-immunization.

There can be no general rule, but in certain cases, in which the past history and haematological studies suggest that it is almost certain that the foetus will later be fatally affected, induction of abortion may well save the mother's life and health. This is illustrated by the following case.

A rhesus-negative woman, aged 31, married to a homozygous rhesus-positive man, had had five previous babies and one abortion. The last three of the babies were stillborn or died immediately after birth, one being hydropic. Despite careful antenatal supervision this woman sustained abruptio placentae at the twenty-sixth week of her seventh pregnancy. The foetus died *in utero*, and the subsequent premature labour was complicated by severe and persistent post-partum haemorrhage associated with afibrinogenaemia. This near-tragedy, the probability of which was foreseen, could almost certainly have been avoided by therapeutic abortion. This was advised in early pregnancy but was refused by the patient on religious grounds.

Changing Indications for Induction of Abortion

The indications for inducing abortion shown by our experience do not constitute a complete list of possibilities, but they do illustrate that the circumstances

*The possible adverse effect of influenza on the foetus is discussed in recent papers by Victoria Coffey and W. J. E. Jessop (*Lancet*, 1959, 2, 935) and by M. J. Pleydell (*Brit. med. J.*, 1960, 1, 309).

†Though it is usual to speak in terms of weeks of pregnancy, this and subsequent figures refer to weeks of amenorrhoea. This means that the duration of pregnancy is approximately two weeks less.

justifying therapeutic abortion are for ever changing with the advance of medical knowledge. The number of therapeutic abortions performed in each of the two successive five-year periods was the same but the indications were altered. Thus pulmonary tuberculosis virtually disappeared, and in its place appeared other conditions such as malignant disease and potential foetal injury. Comparable lists from other sources might show a swing towards psychiatric indications. The emphasis must also vary with the general health of a community and the geographical incidence of diseases such as rheumatic fever.

It is not long since chorea gravidarum, a past history of difficult labour, lymphadenoma, ulcerative colitis, diabetes mellitus, syphilis, adrenal insufficiency, leukaemia, purpura, epilepsy, otosclerosis, disseminated sclerosis, and many other conditions were acceptable indications for therapeutic abortion. Save in some very special circumstances, none is admissible to-day. And what of to-morrow? Who can say which physical or mental disturbances, at present regarded as being adversely affected by pregnancy, will become amenable to treatment; what hitherto unsuspected impacts of pregnancy on health will be discovered; and what factors governing foetal malformation will come to light? Already the induction of abortion has become more "prophylactic" than "therapeutic." Except for conditions such as hyperemesis gravidarum, there is seldom any hope that by arresting a pregnancy a woman's mental or physical disability will be improved. The operation is nowadays mostly performed with a view to preventing the onset of complications or further deterioration in the primary disease. In this respect not only does the effect of late pregnancy and labour enter into consideration but sometimes even the remote effect of caring for the child after its birth.

Strict adherence to truly medical indications means that the place of therapeutic abortion is shrinking rather than expanding (Rosen, 1954). In practice, and because of misplaced sympathy, pressure from colleagues who may see only one side of the problem, and kindred considerations, it is sometimes tempting to modify personal criteria in assessing a particular case. To make an exception, however, nearly always leads to embarrassing consequences. The induction of abortion on flimsy grounds in one case inevitably results in a demand for further operations for equally doubtful indications. These may come from relatives and friends of the first patient, and sometimes from the patient herself. For if a woman finds it easy to get rid of an unwanted pregnancy she is less careful to avoid another. In Sweden, 38% of women subjected to abortion without sterilization conceive again (mostly unintentionally) within two to four years (Ekblad, 1955). In Japan, 50% of women are pregnant again within 18 months (Gebhard *et al.*, 1959). Such experiences deserve serious consideration by those who would broaden the scope of therapeutic abortion to control population and to include humanitarian and eugenic indications.

It may be that public opinion and medical ethics in this country will some day so change as to result in the legalization of abortion for eugenic reasons. So long as the present attitude obtains, however, new legislation which aimed to define more exactly the circumstances in which abortion is justifiable could be in the worst interests of both patient and doctor. Rapidly occurring developments in medical knowledge might result in its becoming quickly outmoded. The British Medical

Association Committee on Medical Aspects of Abortion (1936) and the Interdepartmental Committee on Abortion (1939) advocated not legal definitions of the indications for abortion but a modification of the law to the extent that it was made positively rather than negatively clear that abortion is not always illegal. It was argued then, as it has been since, that the present situation leads to women being deprived of what is in the interests of their health because their medical adviser fears the legal consequences of terminating pregnancy. But I have never heard of a specific case in which such a fear has operated when the medical indications were clear. Nor is it likely to happen, because the present characteristically British legal position provides for the greatest flexibility of opinion and for changes in opinion as medicine advances.

The present law is so strict as to control effectively criminal abortion, yet no doctor need fear its consequences if, after proper consultation with colleagues, he terminates a pregnancy which he honestly believes is causing or is likely to cause significant harm to the physical or mental well-being of his patient. "The essence of the offence is the guilty intent" (Riddell, 1927), and it would seem that one of the best ways to remove any doubt about motive in any case is to make it a rule never under any circumstances to accept a fee or other reward. This applies not only to those performing therapeutic abortion but also to those concerned in the consultations which should precede a decision to undertake such an operation.

The Patient's View

There can be no generalizations about the place of therapeutic abortion. The need for the operation has to be judged separately for each case, judged against a background of medical knowledge but in the light of the special circumstances of that case. When it is decided that there are no medical grounds for terminating an unwanted pregnancy, it is important to warn the patient against attempting to interfere with the pregnancy herself and against resorting to illicit practitioners. That there is a real chance that a woman will adopt these measures is shown by the figures of Anderson (1957) and by the experience of most gynaecologists. It is more likely among the married than the unmarried, and always involves danger to life and health.

When in a particular case there seems to be a medical reason for considering therapeutic abortion, the doctor from whom the patient first seeks advice, no matter whether he be general practitioner, surgeon, physician, or gynaecologist, is wise not to mention the possibility to her lest he prejudice the position. A second and possibly third opinion (including that of the person who is expected to perform the operation) should be obtained, and only when there is professional agreement that abortion is indicated should the matter be discussed with the patient and her husband. The ultimate decision then rests with them. "We have no right or duty to do more than put before wife and husband the relevant facts as we know them, and advise what we think to be the lesser evil" (Batten, 1939).

Many women, often those without special religious scruples, will refuse therapeutic abortion despite the strongest medical advice in favour. They willingly accept any risk to satisfy maternal instinct. The multi-gravida can console herself that, by sacrificing one

pregnancy, she is preserving her life and health for the better care of her children already born. The primigravida, however, who consents to the destruction of her pregnancy may have no consolation other than a few more years of life, which, being childless, are to her not worth having. If there is a hope of children in the future, when her health has improved, she may agree. When there is no such hope, then her refusal to accept technical advice, if difficult for the male mind to understand, may be both correct and wise. It may cost the medical attendant constant work and worry; it may even result in the spoiling of his statistics for maternity work. It nevertheless illustrates a woman's sense of values, her courage, and her loyalty to her sex.

Summary

Though the practice of therapeutic abortion varies widely in frequency from one hospital to another, a personal experience of 63 cases during 10 years suggests that the need for the operation does not now arise more often than once in every 1,000 pregnancies.

Though the underlying principles governing a decision remain unchanged, the actual indications for terminating pregnancy alter rapidly with advancing medical knowledge. A relatively new indication is pulmonary insufficiency.

Each case needs to be judged separately according to the special circumstances of that case. Any one disease cannot be said to be always an indication for therapeutic abortion.

In making a decision the hazards of therapeutic abortion need to be weighed against those of the continuance of pregnancy. The gynaecologist who is expected to perform the operation should therefore always be one of those consulted before the procedure is suggested to the patient.

The final decision rests with the patient and her husband.

Certain indications for therapeutic abortion are discussed, and it is noted that inherited taints, and diseases such as rubella which threaten the health of the foetus, are only acceptable legally when it can be shown that worry over potential foetal abnormality is adversely affecting the mother's health. Rhesus incompatibility can, however, be dangerous to the mother as well as to the foetus.

Psychiatric indications are easily abused to justify the removal of an unwanted pregnancy.

Induction of abortion nowadays rarely offers hope of improvement or cure of the patient's disease: it generally aims to do no more than prevent deterioration of the mother's condition, and is therefore more often prophylactic than therapeutic.

REFERENCES

- Anderson, E. W. (1957). *Proc. roy. Soc. Med.*, **50**, 323.
 Arkle, J. (1957). *Brit. med. J.*, **1**, 558.
 Batten, L. W. (1959). *Ibid.*, **1**, 1116.
 Bell, Julia (1959). *Ibid.*, **1**, 686.
 Eerthelsen, H. G., and Østergaard, E. (1959a). *Dan. med. Bull.*, **6**, 105.
 — (1959b). *Ibid.*, **6**, 110.
Brit. med. J., 1957, **1**, 457.
 Caughey, A. F. (1959). *Amer. J. Obstet. Gynec.*, **77**, 1355.
 Coffey, Victoria P., and Jessop, W. J. E. (1959). *Brit. med. J.*, **1**, 1116; *Irish J. med. Sci.*, 1959, p. 1.
 Committee on Medical Aspects of Abortion (1936). *Brit. med. J.*, **1**, Suppl. p. 230.
 Dewhurst, C. J. (1953). *J. Obstet. Gynaec. Brit. Emp.*, **60**, 76.
 Ekblad, M. (1955). *Acta psychiat. scand.*, Suppl. No. 99.
 Gebhard, P. H., Pomeroy, W. B., Martin, C. E., and Christenson, Cornelia V. (1959). *Pregnancy, Birth, and Abortion*. Heinemann, London.
 Greenberg, M., Pellitteri, O., and Barton, J. (1957). *J. Amer. med. Ass.*, **165**, 675.
 Gregg, N. M. (1945). *Med. J. Aust.*, **1**, 313.
 — (1946). *Trans. ophthal. Soc. Aust.*, 1944, **4**, 119.
 Grönvall, H., and Selander, P. (1948). *Nord. Med.*, **37**, 409.
 Hammer-Jacobsen, E. (1959). *Dan. med. Bull.*, **6**, 113.
 Hesselstine, H. C. (1959). *Amer. J. Obstet. Gynec.*, **77**, 1356.
 Hill, A. B., Doll, R., Galloway, T. McL., and Hughes, J. P. W. (1958). *Brit. J. prev. soc. Med.*, **12**, 1.
 Interdepartmental Committee on Abortion (1939). H.M.S.O., London. Abstract in *Brit. med. J.*, 1939, **1**, 1248.
 Jackson, A. D. M., and Fisch, L. (1958). *Lancet*, **2**, 1241.
 Jeffcoate, T. N. A., and Scott, J. S. (1959). *Amer. J. Obstet. Gynec.*, **77**, 475.
 Joint Paediatric and Obstetric Committee of the Joint Tuberculosis Council (1958). Report.
 Kaye, B. M., Rosner, D. C., and Stein, I. F. (1953). *Amer. J. Obstet. Gynec.*, **65**, 109.
Lancet, 1957, **2**, 1103.
 Lundström, R. (1952). *Acta paediat. (Uppsala)*, **41**, 583.
 Martin, Mary E. (1958). *Brit. med. J.*, **2**, 773.
 Ministry of Health (1957). Report on Confidential Enquiries into Maternal Deaths in England and Wales, 1952-54. H.M.S.O., London.
 Morris, N. F., and Browne, J. C. McC. (1958). Editors of *A Symposium on Non-toxaemic Hypertension in Pregnancy*. Churchill, London.
 Nixon, W. C. W. (1957). *Proc. roy. Soc. Med.*, **50**, 326.
 Oram, V. (1952). *Ugeskr. Læg.*, **114**, 482.
 Oxorn, H. (1959). *Amer. J. Obstet. Gynec.*, **77**, 628.
 Pitt, D. B. (1959). *Brit. med. J.*, **1**, 1301.
 Pearce, J. D. W. (1957). *Proc. roy. Soc. Med.*, **50**, 321.
 Polonio, P., and Figueiredo, M. (1955). *Mtschr. Psychiat. Neurol.*, **130**, 304.
 Riddell, Lord (1927). *Lancet*, **1**, 219.
 Robinson, A. L. (1931). *J. Obstet. Gynaec., Brit. Emp.*, **38**, 338.
 — (1933). *Ibid.*, **40**, 39.
 Rosen, H. (1954). *Therapeutic Abortion*. Julian, New York.
 Scott, J. S. (1958). *J. Obstet. Gynaec. Brit. Emp.*, **65**, 689.
 Siegel, M., and Greenberg, M. (1959). *Amer. J. Obstet. Gynec.*, **77**, 620.
 Sjövall, A. (1951). *Arch. Gynäk.*, **180**, 324.
 Stewart, C. J., and Simmonds, F. A. H. (1947). *Brit. med. J.*, **2**, 726.
 Sutherland, A. M., Mair, J. T., and Bruce, D. F. (1955). *Glasg. med. J.*, **36**, 411.
 Swan, C., Tostevin, A. L., and Black, G. H. B. (1946). *Med. J. Aust.*, **2**, 889.
 — Moore, B., Mayo, H., and Black, G. H. B. (1943). *Ibid.*, **2**, 201.
 Thompson, W. B. (1954). *Amer. J. Obstet. Gynec.*, **67**, 810.
 Weilerstein, R. W. (1944). *J. Amer. med. Ass.*, **125**, 205.
 Wesselhoeft, C. (1949). *New Engl. J. Med.*, **240**, 258.
 Westman, A. (1955). Quoted by Gebhard *et al.* (1959).
 White, M. A., Prout, C. T., Fixsen, C., and Foundeur, M. (1957). *J. Amer. med. Ass.*, **165**, 138.
 Whitehouse, B. (1932). *Brit. med. J.*, **2**, 337.
 Williams, L. (1957). *Ibid.*, **2**, 1087.

Chiropody is one of a group of services which are supplementary to the medical profession, and the opportunities it offers as a career for young persons about to leave school are set out in *The Chiropodist*, a revised booklet in the *Choice of Careers* series published by the Central Youth Employment Executive. The booklet points out that foot troubles have become relatively common because of developments in urban and industrial civilization, and also from the wearing of unsuitable boots or shoes. For a long time the demand for treatment was met by those who had acquired their knowledge and skill from family traditions or apprenticeship, but eventually the need for proper standards of training and practice was recognized. Details of the day-to-day work of a chiropodist, both in and out of the surgery, are given, together with information about the equipment used, the techniques for making special appliances, and openings and salaries in a growing profession which offers increasing scope as people realize the benefits to be derived from treatment. Candidates for training in chiropody must have received a good general education. The training course, as approved by the Minister of Health and the Secretary of State for Scotland, for employment in the National Health Service lasts three years. A list of the schools at which this training is provided is included as an appendix to the booklet. (No. 61, H.M.S.O., price 6d. net.)