

THE NOVA SCOTIA MEDICAL BULLETIN

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Too Many People?

The year 1967, Canada's Centennial, will be variously recognized by Canadians in word, thought or deed. Of attitudes, a spectrum will be discernible ranging from chest-expanding pride through indifference to deflating scepticism. Nevertheless, beyond this rainbow of reaction, there will be thanksgiving that we live in a country of such natural abundance.

It has been said that Canada has too little history and too much geography. Perhaps this is a little less true each day; perhaps a Centennial even produces instant history! As for geography, can we ever regret an excess of this heritage? For the wealth contained within its borders makes Canada one of the fortunate nations on this earth.

A factor more vital than history to a young country is its people. Surely the contrast between its score of millions and its massive expanse gives Canada a limitless potential. But we must never ignore the stark fact that some other countries are much less fortunate. While Canada can with ease, and even profit, absorb an average increase in population of 2% each year - the overall figure given for the world increase today - what of the other parts of the world? The increase may be as much as 4% yearly; and this is occurring where the density of population is already much above average. And today, about 600 million starving people are concentrated in those very areas least able to withstand the pressures of human expansion.

At the recent 3rd World Conference on Medical Education, H. L. Keenleyside, himself a Canadian, suggested that the medical profession has the responsibility as well as the competence to contribute to the solution of this problem: a problem which, at the opening of Canada's second century as a nation (a word itself implying responsibility), would seem to be the greatest now facing the world (if its antithesis, nuclear holocaust, be disregarded for the moment). Certainly there are several reasons why the medical profession, particularly in a country like Canada, should concern itself with this vast issue. A basic premise is this: that a civilized country with a wealth of human and natural resources is morally obliged to give of itself. Specifically, these points should be considered: that the discovery of techniques which save and prolong life must be linked to techniques which permit human life to be lived at least above the animal level. Also, that doctors have the knowledge and ability to modify the human reproductive cycle, and if, as some economists predict, the choice may have to be made between birth control and genocide, it must be obvious where our choice would lie. A third point is that doctors are in a position to understand and treat the problems of social maladjustment in an age when the old, familiar orders are blown over by the winds of change in today's complex world. Another is that the medical profession has a contribution to make in the management of today's technological way of

life - for example, in the application of atomic medicine, of space medicine and underwater medicine to name but three. Undoubtedly we will be faced with challenges that can only be met with complex scientific methods. We are also able to utilize techniques to increase production of the world's food, for example, the application of genetics and biochemistry to animal and vegetable husbandry.

But beyond these are reasons more personal and closer to the core of a doctor's philosophy. Sir Arcot Mudaliar, in his Presidential address at the conference referred to, represented these as a new longing for what could be done for humanity at large. Today the inequality of progress among nations has widened the gap between the fortunate and the unfortunate, and humanity suffers the more. Mudaliar commented that it should be the endeavour of the profession to persuade society and the state to provide an equal opportunity for all in various countries to have the same minimum standards of health. Whether such standards be withheld because some men, women and children are caught in the searing conflicts of ideologies, or whether more natural factors operate, today, a

hundredfold more than a hundred years ago, we in Canada, as the fortunate ones, have the responsibility to look at others less fortunate, and be concerned.

Interestingly, at the time of the World Conference held in India in November 1966, a report on medical education was presented, nearer home. The report from Dalhousie University, is purely domestic; but it is good that doctors in this province should be concerned about the need for a changing approach to medical education today. For education, in the general sense, is the key to progress; It is an activity in which we as individuals can take part, so that we may influence for good those beyond our borders. It is to be hoped that the interest in medical education in Nova Scotia will continue, and more, that any curricula introduced will ensure that the doctors of tomorrow will be grounded not only in medicine, but also in the study of social and political ideas and ideals that can be used for good or ill. Let us hope that we can combine our provincial work with the contributions which we can also make in the years ahead to the good of the wider world. □

D.A.E.S.

NOVA SCOTIA MEDICAL BULLETIN

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THE BULLETIN is planning a regular Medical-Legal section devoted to **Medical Legal Enquiries**.

You are invited to contribute questions.

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Please send completed form to: - Ian Maxwell, M.D.
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PUBLISHED BY THE MEDICAL SOCIETY OF NOVA SCOTIA, 5849 UNIVERSITY AVENUE, HALIFAX, N. S.

Inaugural Address

113th ANNUAL MEETING OF THE MEDICAL SOCIETY OF NOVA SCOTIA
NOVEMBER, 1966

G. McK. SAUNDERS, MD, FRCS(C)

Amherst N. S.

The By-laws of our society state that the president shall present an address at its annual meeting and it has been customary to have this presentation at the conclusion of the term of office. Although there is no provision for the newly installed president to officially address you, Dr. Tom Gorman, two years ago, made the annual meeting an opportunity for remarks introductory to his term of office. With this precedent established, and continued last year, my words this evening will be brief and in the general outline of my predecessors.

The Office of President

It has been observed that the office of President of this society has become progressively more busy, and with national and provincial medicare on the horizon the activities of this office have increased even more rapidly during the past three to four years. In the past year the physicians of this province have indeed been fortunate to have had, as their first officer, Dr. Tony Griffiths. Not only has he been able to sort out and manage the more mundane matters of the society and the work of its many committees, but he has represented our profession with intelligence and great diligence as chairman of the Physicians' Services Insurance Committee. This has been a hard working committee and under Tony's guidance the policy of this society has been well transmitted to the Medical Care Insurance Advisory Commission during the nine meetings we have had with this commission. Through his efforts we have also established a good *rapport* with this government appointed body. During the year his duties have taken him away from his lovely wife, Monica, and family on many occasions and to them we give our appreciative thanks. To his understanding partner, Dr. Dennis Drury, who has filled the local professional gap during his absence from Bridgewater, we also extend our appreciation.

Tony Griffiths has served the communities of Antigonish and Bridgewater as a competent radiologist, and the medical profession of this province as an outstanding member of the executive, president-elect and president of The Medical Society of Nova Scotia. We can look forward to many years

of profit from his experience and advice and it is with great pleasure that I present him with the Past-President's pin.

We are now starting a new year and, on your behalf, I offer congratulations to the new president-elect, Dr. Arthur Sutherland, officers of the society, members of the executive and the chairmen of committees. Dr. Sutherland comes to us with much past experience and service to the Society. During the coming year I anticipate his advice and counsel and hope that he will enjoy this opportunity to meet so many of his confrères and to visit many of the Branch Societies. It would appear that it could well be his burden to carry the profession into Government Insured Physicians' Services, and any experience and wisdom he can accrue from such associations will be to his and our advantage.

At this point I wish to thank you most sincerely for the confidence you have expressed by electing me to the office of President. This is unquestionably a high honor and I look forward to carrying out the duties of office with my greatest capacity. The increasing complexities and responsibilities have been mentioned and I believe that only the best efforts of all officers, executive members and Branch Societies can lighten the task and produce the best results for the society.

Medical Services Insurance

During the coming year the most urgent problem will continue to be "medicare". In the past the ground has been well cultivated by the Medical Economics Committees, the Special Research Committees and the Physicians' Services Insurance Committee. The business of conveying and interpreting society policy to the Medical Care Insurance Commission will continue. In addition, it is very likely that direct discussions and negotiations with government will start. As the passing scene is surveyed, we may feel reasonably assured that so much of the work done by the Canadian Medical Association and this provincial division has not all been in vain. The Saskatchewan impasse of 1962 left a mark which points out to all parties concerned that repetition in any other

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Valedictory Address

113th ANNUAL MEETING OF THE MEDICAL SOCIETY OF NOVA SCOTIA
NOVEMBER, 1966

A. J. M. GRIFFITHS, MRCS, LRCP

Bridgewater, N. S.

There is some relief in handing over a burden which has been full of interest and most rewarding, but none the less arduous. There is gratitude for the honour of having served you as President; for the heartwarming hospitality with which I have been received by all the Branches; for the opportunity and the pleasure of meeting so many colleagues whom otherwise I might never have encountered. There is a debt which I can never repay to Charlie Beckwith and his Staff for their unfailing support, and to my friends on the Physicians Services Insurance Committee who have worked with me so loyally, so unselfishly and with never a cross word. And finally a special thank you to my partner Denis Drury, to my fellow practitioners in Shelburne, Queens and Lunenburg Counties and to my wife and family, who have all at one time or another released me from my obligations to them, so that I might devote time to the affairs of the Society.

I think it was Samuel Johnson who said "There is nothing sharpens a man's intellect so much as knowing that he is to be hanged in the morning". Our profession has been in the condemned cell for the past few months and the reprieve granted by Mr. Sharp is only temporary. I am not suggesting that Mr. Donahoe or Mr. Black are hangmen at heart, but the fact remains that we have been compelled to examine our present situation and make some re-appraisal of our standards and values. Without the stimulus of threatened Government intervention in the practice of medicine, I doubt if we should have taken so much interest in the methods or effectiveness of professional self-discipline; in the rationale of fee schedules; in the factors which may influence a young doctor in his choice of general practice or a specialty, or in the patchwork of existing legislation through which medical services are at present available to some or all of our citizens. These are but a few of the areas which we have recently explored, stimulated by the gentle, but none the less penetrating probing of the Medical Services Insurance Advisory Commission. At the same time we have studied plans for providing medical care already in existence in other

provinces and other countries. Naturally, too, we have taken a critical look at the Nova Scotia Hospital Insurance Commission, because this is an organization in being and within our own province. In many respects it has been highly successful but there are imperfections in its terms of reference and in its methods of working. I believe we have learned from its successes and from its failures.

As a profession, I am convinced that we are better informed about ourselves and are more realistic in our thinking than we were a year ago. At that time I said that any plan for medicare should be critically examined to ensure that there was a fair equation of responsibilities with privileges for both patients and doctors. I have seen no reason to change this yardstick, which in essence means that neither the public nor the medical profession should exploit the other and that by and large government should limit itself to seeing that a reasonable balance is maintained. If such a happy state of affairs is even to be approached, let alone achieved, it seems to me that there are certain unpalatable facts which will have to be accepted by patients, by government and not least by ourselves.

To the Patient

To the public I would say "Don't expect too much from Medicare. No plan will provide you with a doctor at any time of the day or night; the best it can do is to pay the bill - or some of it - when you have found him. He may well become more difficult to find rather than easier. All of us, doctors included, look forward in the years ahead to less arduous work and more leisure. Medicare will increase demands for service; some doctors will be required for administration and other professions will become equally attractive financially. These factors will tend to reduce the number of practitioners available. Added to which, in the interests of economy, government will be tempted to supply the lowest acceptable rather than the highest possible standard of medicine.

You will have to accept changing patterns of medical practice; these would come in any case, with or without medicare, but the pace will be

quicker with it. Already house-calls have been largely replaced by office consultations and more use is being made of hospital out-patient departments. The necessity for higher medical productivity and the use of more complex and expensive aids for diagnosis and treatment will, I think, accelerate this trend. I foresee the day when hospitals will become community health centres from which your doctor will provide both in-patient and out-patient care. Eventually, you will probably have to forego the luxury of a personal physician and accept the concept of more scientific but less sympathetic care. Even today the team is replacing the individual for many technical procedures.

Finally, you may still have the problem of paying for drugs, ambulances, dental care, home nursing and services of a similar nature. I suspect that you will discover that the doctor's bill was not quite such a large item in your health expenses as you thought".

Concerning Governments

At this point I would like to remind you that we as a Society have gone on record as favouring a plan for prepaid medical care insurance, universally available to all on a voluntary basis. We asked for this in 1963 and we are asking for it again in 1966. We have taken the view that Government should confine itself to ensuring that coverage is available to all, regardless of their economic circumstances, by subsidising those in need of subsidy in accordance with their need. We do not accept the protests of those who say that an income test is degrading; we ourselves, together with millions of other Canadians, submit to an annual income test to determine our ability to pay tax. We see nothing degrading in using an identical test to establish the need for subsidy.

If our recommendations were adopted - and we are not alone in these; we are in step with the Governments of British Columbia, Alberta and Ontario - if our recommendations were adopted and the Federal Government would abandon its obstinate doctrinaire approach to the problem; if it would stop basking in a glow of self-satisfaction at having pulled a fast one over the Province of Quebec by devising a cost sharing incursion into an area of provincial responsibility on a take it or leave it basis - with the onus on the province to explain why it will not take it - if this Government would heed the advice given it by those who will have to provide the service - in fact if it would abandon a position which is patently doctrinaire and expedient, then, I submit, it might be possible to establish a plan which could cover physicians services and some other benefits - such as prescription drugs - a plan which would be available to all by voluntary choice; providing more benefits for those in need at less cost to the tax-payer than

the compulsory coverage of physicians services only for every citizen, regardless of whether or not he requires State assistance.

Under such a plan, with an increasing Gross National Product and a more even distribution of the rewards of modern technology, we could expect a diminishing number of citizens in need of subsidy in the years ahead and a decreasing burden on the tax-payer. A universal compulsory plan, on the other hand, seems likely to demand ever increasing sums of money for a gradually deteriorating quality of service.

I would like to quote an Editorial of the London newspaper, "The Daily Telegraph", of last Thursday week, November 17th.

"In the abstract, the arguments against the present method of financing medical care in this country are unanswerable. They are competently restated today in a pamphlet by Dr. Wyndham Davies, published by the Conservative Political Centre. The system of capitation fees plus free-at-the-time service provides the maximum incentive for misuse by patients and the weakest possible motive for diligence and efficiency on the part of doctors. What is more, the dependence of the Service on taxation makes it impossible to finance it adequately. All this, as Dr. Davies points out, points to a complete reorganization of structure based, possibly, on the State subsidy of approved private schemes of health insurance plus small payments per visit by the patient. Since the Conservative party is not theologically committed, as the Socialists are, to universal free welfare, why does it not take the initiative in proposing reform?"

Three reasons are usually advanced for this reluctance. Any fundamental change, it is said, would be administratively impracticable. As Dr. Davies contends, however, the change he is recommending represents the commonest form of provision in the outside world and is in particular the method successfully employed in New Zealand, Canada and Australia - all favourite refuges of disillusioned doctors from Britain. Secondly, any attempt to reintroduce the market into medicine would be incompatible with the proper care of the indigent and chronically ill. It would be perfectly possible, however, to maintain out of public funds a supplementary service to cope with these exceptions. As a last resort it is objected that there is no sign of public demand or even public willingness for change. Not all the evidence points this way, but the harsh truth is that change has become inevitable and that the choice is between deliberate improvement and automatic deterioration. Dr. Davies has thrown out a challenge to which his party should respond".

It seems that the present policy of our Federal Government is another proof of the adage "There are none so blind as those that will not see".

As far as our Provincial Government is concerned, we must recognize that it is in an extremely difficult position. Nova Scotia is not a wealthy province and the temptation to accept the Federal

money must be powerful, even if the conditions imposed are restrictive and uncongenial.

Nevertheless, I would admonish it to be as flexible as possible. Methods and men must be changed with the times. The criterion must always be what is best for the patient and not what is administratively most convenient. Traditional financial controls may well prove more costly than any savings achieved. Ensure that medicare does not stifle research or create a climate so unfavourable for practice that other medical pastures appear greener; this has happened in Britain and could just as easily happen here. Bear in mind that time spent by a doctor filling in forms is time stolen from his patient. Be prepared to learn from the inevitable mistakes which will be made and be ready to amend legislation or change regulations. Health should never be a political football or a matter for saving face. Remember, too, the grave responsibility assumed when priorities for expenditure are decided, and the potential cost in human suffering if these decisions are wrong.

To The Medical Profession

To my colleagues, I feel constrained to utter a few words of warning.

We have always indicated an intense desire to practice under any medicare plan as independent contractors. Some of us would go so far as to claim that a perfectly practicable plan could be devised in which government confined itself to reimbursing the patient for care received and did not in any way come between the patient and the doctor. Others, perhaps, would accept a plan which would extend universal coverage through an agency such as Maritime Medical Care. However, any plan which leaves us with the privilege of being self-employed also imposes the responsibility for providing all the service which may be demanded from us. This may well prove increasingly difficult with an expanding population making greater demands from a diminishing number of doctors. We must be aware of this problem and make plans to overcome it or be prepared to accept changes in working conditions designed to relieve us of a liability which we might not be able to meet.

Finally, I think there is a risk that we may indulge, at times, in a form of intellectual arrogance; a feeling that because we are masters of our own field of knowledge, we are equally at home in all

We must always be prepared to explain our position, to substantiate our claims and to defend our principles. We must not pontificate. Reason rather than emotion should support our case. I believe that our standing in the eyes of the public, the Press and the Government of Nova Scotia is as good as, if not better than, that enjoyed by the profession in any other province. This can only be maintained by frankness and honesty on our part.

I have made no attempt to dot the i's or cross the t's this evening. There are other and more enjoyable ways for us to spend the time.

In conclusion, I would like to paraphrase a remark made by Prince Philip. It's no good shutting our eyes and saying Medicare is best three times a day after meals and expecting it to become so. We shall all have to work at it constantly - patients, government and ourselves. There is no easy solution. □

Inaugural Address

(continued from page 24)

province is a poor substitute for proper conversations and agreements before any insured physicians' services plan is thrust upon either the people or the profession. We may take comfort, both as citizens and doctors, for reasons that are becoming more apparent to all, that a scheme similar to the British Medical Plan is very unlikely to come our way. We have made our point respecting freedom of choice of physician and patient and of the democratic privilege of "opting out". The profession expects to remain self-disciplined and self-regulated. If this is to be, and to continue, we must realize that it involves the business of reciprocal discussion, of not only assuming rights but of discussing professional rights and responsibilities related to ourselves and to society as a whole. During the past few years the medical profession has worked hard with its problems (including professional self discipline and medicare) and we can anticipate that in the months ahead the onus of self imposed self discipline, with its many variations, will be weightier and will try us to the sticking point. If the problems of doctors are assessed in this light the tasks of your president and representatives will be made somewhat easier. □

RETIREMENT

"It is not what a man retires from but what he retires to, that is important," said Dr. E. L. Bortz in his address this year to the Voluntary Committee on Health of the Senate and House of Commons, Ottawa.

"When a man retires out of life, life retires out of him and his recession is accelerated," the past president of American Medical Association said.

Circumvallate Placenta

T. R. MARTIN, MB, BS*

Halifax, N. S.

The circumvallate placenta has not received the attention it warrants. Standard text-books pay scant attention to the condition, despite the fact that several papers have been published stressing that it is a cause of serious complications in pregnancy.

Pathology and Etiology

The chorionic and basal plates of the placenta are normally approximately equal in size. When the chorionic plate is relatively diminished in size, then a circumvallate placenta results. (See Fig. 1).

The placental portion outside the confines of the chorial plate is termed the extra-chorial placenta and this extra-chorial section becomes covered with decidua, continuous with that lining the uterine cavity. (Fig. 1)

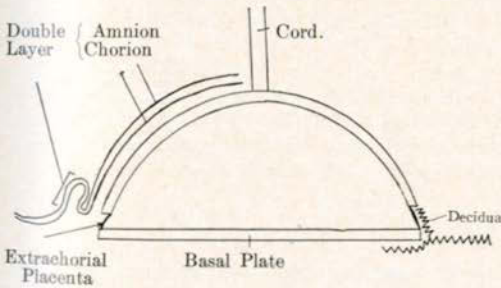


Figure 1. Circumvallate placenta, seen in section.

At the periphery of the chorial plate the fetal membranes (amnion and chorion) become folded upon themselves and thickened, so that the appearance is that of a fibrinous ring at some distance from the placental edge. (Fig. 2) The distance from the ring to the placental margin is variable and often the thickened ring and placental edge are not concentric, so that an incomplete circumvallate placenta results. (Fig. 3) Actually, the incomplete form is said to be more common than

the complete type. Note that the fetal vessels appear to terminate at the duplicate ring, not as normally, at the edge of the placenta. (Fig. 4)

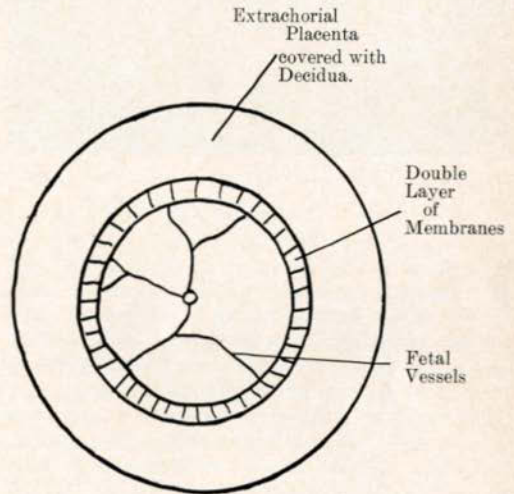


Figure 2. Circumvallate Placenta, diagram of amniotic surface.

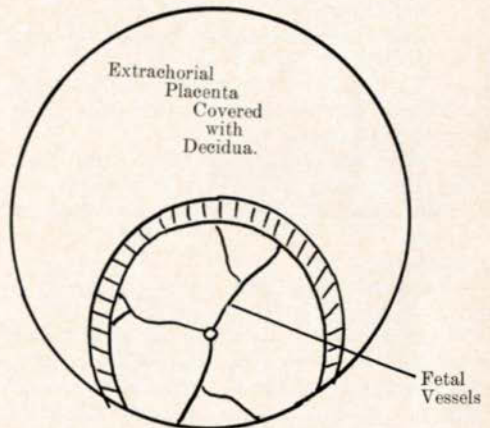


Figure 3. Incomplete circumvallate placenta.

*Resident in Obstetrics and Gynaecology, Victoria General Hospital.

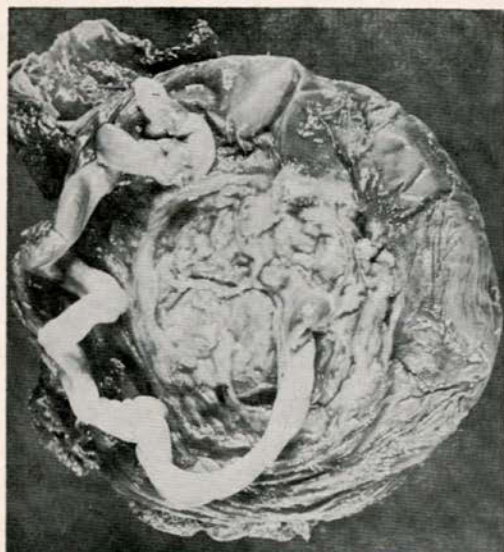


Figure 4. Circumvallate Placenta. Note restriction of foetal vessels by double membrane ring.

Many theories have been offered to explain the occurrence of the circumvallate placenta. All are inadequate, but most authors favour Williams' concept which implies that early in pregnancy the chorion frondosum is inadequately developed so that it is small compared with the basal plate. Because of the limited area of the frondosum and the demands of the developing embryo, the placenta grows rapidly laterally, to extend its area of contact with the maternal circulation. This rapid lateral growth splits the decidua, so that the extrachorial placenta becomes covered with decidua.

The architecture of the circumvallate placenta is significant because: -

- a. the decidua over the extrachorial placenta is delicate and susceptible to trauma and thus hemorrhage.
- b. The inadequate placenta can result in placental insufficiency, fetal malnutrition and intrauterine death.
- c. The membranes are easily torn from the placenta, so that retained products and hemorrhage may result, in the third stage of labour.

Significance

Circumvallate placenta is said to occur in about 1/150 to 1/200 of all deliveries.

On reviewing the literature, one is struck by the variable importance allotted to this entity, by different authors. Scott and Ziel have reviewed the work of several authors and noted their reported incidence of complications. The figures given in table I have been derived from these authors, but have been "rounded off" for simplification. The great variation in the figures is obvious.

TABLE I
INCIDENCE OF COMPLICATIONS WITH CIRCUMVALLATE PLACENTA

Dangers to the Mother	Incidence
Antepartum hemorrhage	2 - 60%
Postpartum hemorrhage &/or manual removal of placenta	2 - 45%
Hydrorrhoea gravidarum	2 - 25%
Dangers to Child	Incidence
Fetal loss (abortions & perinatal mortality)	4 - 45%
Premature labour	10 - 65%

Clinical Features

Hemorrhage

Hemorrhage may occur in early, mid or late pregnancy and also in the post partum period.

Early pregnancy hemorrhage may suggest a diagnosis of threatened abortion, or indeed an abortion may ensue.

More often the patient presents in the latter half of pregnancy with a history of scant, intermittent per vaginam bleeding, which may alternate with a brownish p.v. discharge. Pain is most often absent but some patients may experience mild abdominal pains, which have to be differentiated from the contractions of an early labour.

Because of retention of products (placenta, membranes) and post partum hemorrhage, manual removal of intrauterine tissue may be necessary.

Hydrorrhoea Gravidarum

A vaginal watery discharge is said to be a feature of circumvallate placenta and the effusion may be difficult to distinguish from the liquor amnii of ruptured membranes.

Premature Delivery and Fetal Loss

The entity may cause abortion. Intrauterine death may result from placental insufficiency. Premature delivery with its associated high neonatal mortality, is probably common.

Diagnosis and Treatment

The diagnosis can only be definitely made when the placenta is delivered and examined. However, a complaint of slight intermittent p.v. bleeding, particularly during the second trimester of pregnancy, should suggest the diagnosis. A history of threatened abortion earlier in the pregnancy adds support for the diagnosis.

Because of the painless bleeding the condition is most often confused with placenta previa, but placenta previa characteristically presents with an initial hemorrhage in the last trimester of pregnancy. However, placentography or per vaginam examination may be warranted, to exclude the diagnosis.

If a patient with circumvallate placenta, presents with p.v. bleeding and mild abdominal pains, then the condition has to be distinguished from abruptio placenta. However, abruptio most

TABLE II

**DATA FROM SEVEN CASES OF CIRCUMVALLATE PLACENTA
PRESENTING BETWEEN OCTOBER 1965 AND JUNE 1966**

Delivered (wks. gestn.)	Early Bleeding	Late Bleeding (after 20 weeks)	Hydrorrhoea or prem. Rupt. Mem.	Pre-lab. Pains	P.P. Hemorr. / Retained Placenta	Babies 5½ lbs. or less	Type of Circumvallate Placenta
1. 27	4 & 12	24 & 26	—	+	Retained Plac., later } Spont. del'd }	+ & died	Complete
2. 34½	—	34	34	—	+	+	Complete
3. 37	4 & 12	35 & 37	37	+	—	—	Incomplete
4. 32	—	29 & 32	32	—	—	+	Incomplete
5. 34	20	31 & 34	—	—	—	5½ lbs.	Incomplete
6. 31	(Intermittently since 2 mths. preg.)		26	—	Retained but expelled } after 50 mins. }	+ & died	Complete
7. 31	15	In labour	25	+	—	+ & died	Complete

often presents as a single acute episode. A history of intermittent bleeding with intervals of days or weeks when the patient is asymptomatic, would be most unusual with abruptio placenta.

The management of a suspected case of circumvallate placenta is essentially similar to that of a case of placenta praevia. If continued intrauterine existence would be beneficial for the fetus, and blood loss is not excessive, a conservative approach is indicated. Otherwise, the pregnancy should be terminated.

Local Cases (Table II)

Over a nine month period (October 1965 to June 1966) details of ten cases of circumvallate placenta have been obtained.

Three patients aborted and placental examination revealed circumvallate deformities.

Details of the other seven cases are depicted in the table. It is noted that most of the patients had slight intermittent hemorrhages and delivered well before term. Post-partum hemorrhage was a feature in two patients. Two patients expelled temporarily retained placenta spontaneously and another did likewise with retained membranes.

Case 7 was admitted with evidence of an intrauterine infection, subsequent to premature rupture of the membranes of six weeks duration. The outcome of prematurity and infection on the child in this case is noted.

Six of the seven patients delivered offspring of 5½ lbs. or less and three neonates died, primarily as a result of prematurity.

Summary and Conclusions

The pathology and clinical entity associated with circumvallate placenta is described. The conflicting views of several authors are noted.

Cases of circumvallate placenta presenting in a nine month period with clinical features and complications are outlined. The number of circumvallate placentae delivered incidentally in pregnancies following a normal course and outcome, over the same period, is not known. However, it is felt that the circumvallate placenta is worthy of more consideration, being a cause of pregnancy hemorrhage, premature delivery and perinatal mortality.

A plea is made for the examination of all placentae at delivery so that the importance of the circumvallate placenta can be clarified. □

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A Plea For Earlier Consultation in Foetal-Maternal Incompatibility

The Committee of Foetal-Maternal Incompatibility continues to function with an ever increasing number of cases referred for Consultation.

At the weekly meetings held every Thursday at 12:00 noon the problem cases are discussed and all available information is sifted until a final decision is arrived at by majority vote of the members of the Committee.

However, there are cases which are not presented *early* enough in the pregnancy for an attempt to be made to salvage the unborn baby. Granted these are grossly affected cases and only a percentage would be in actuality salvageable. Nevertheless if we, the Medical profession of Nova Scotia, are to do our best for these babies, then *earlier* investigation must be undertaken.

To illustrate this point the following cases are summarised for guidance: -

Case No. 1 Mrs. Rose A. Aged 34 Group O
Rh Negative
Husband Group B Rh Positive
CDe/Cde

- (a) 1958 - Full term delivery alive and well.
- (b) 1959 - Full term delivery alive and well.
- (c) 1960 - Full term delivery exchange transfusion a few hours after birth.
- (d) 1962 - Full term delivery, died a few hours after birth. Jaundiced, Exchange Transfusion
- (e) 1963 - Abortion at three months.
- (f) 1964 - Induced at eight months.
- (g) 1966 - L.M.P. April 21st, E.D.D. October 28th
Blood Antibody titres showed
Anti D Anti C
1:640 1:40

Amniocentesis at 26 weeks showed the bilirubin content of the liquor amnii to be in Zone iii. There was no foetal heart and a stillborn hydropic foetus was delivered.

We appreciate the cooperation of the profession in this effort to protect and salvage the affected Rh baby, and would ask you to write

The Committee of Foetal Maternal Incompatibility,

5821 University Avenue, Halifax

or to Phone 422-6501 (Collect) concerning patients with suspected foetal - maternal incompatibility. □

Case No. 2 Mrs. Elizabeth J. Group O Rh
Negative cde/cde
Husband Group O Rh Positive
CDe/cDE

- (a) 1958 - Full term delivery - alive and well.
- (b) 1959 - Full term delivery - affected and transfused 3 times.
- (c) 1961 - Spontaneous rupture of membranes at 37 weeks - unaffected.
- (d) 1962 - Spontaneous rupture of membranes at 35 weeks - transfused 4 times.
- (e) 1966 - Intrauterine foetal death at 30 weeks gestation.
Blood antibody titres showed

Anti D	Anti C
1:16	1:1 at 15 weeks
1:160	1:1 at 24 weeks
1:1280	1:1 at 30 weeks

Amniocentesis at 30 weeks showed a bilirubin content of 0.3 which placed the graph in Mid Zone iii. Intrauterine foetal death occurred at this time.

These two cases illustrate the tragic foetal loss which may occur if earlier investigation and action is not carried out.

Because of the very poor previous histories in both of these cases along with the rising blood antibody titres, Amniocentesis should have been performed as early as the 22nd week of the most recent pregnancies. If this had been done then both of these cases would have been candidates for intrauterine blood transfusions with perhaps a sixty percent chance of survival of the foetus.

Any Rh Gravida showing Antibodies should be considered for amniocentesis at the 28th to 30th week of pregnancy. As a modification of this, however, any gravida with a history of previously affected babies with a blood antibody titre should probably be tapped as early as the 22nd week.

The John Stewart Memorial Lecture

Intensive Care - Past, Present and Future**

LLOYD D. MACLEAN, MD, FRCS(C)*

Montreal, Quebec

It is an honour and great privilege for me to be asked to deliver the "John Stewart Memorial Lecture" on this occasion. I hope I can perpetuate the memory of his life and work by alluding to a subject that was of great interest to him as well as to his teacher, Joseph Lister.

John Stewart

Dr. John Stewart, the eldest of ten children of the Rev. Murdoch Stewart, was born at St. George's Channel, Cape Breton, in 1848. He received his early education from his father, and at the age of 14 was sent to the Model School in Truro. After a year of teaching in Sydney he left for Scotland where, for a period of three years, he was engaged in farming. He attended one year in Arts at Edinburgh University (1871-72). Returning to this city, he began the study of medicine, which he completed in Edinburgh in 1877. It was during this period that he became associated with Professor Joseph Lister. In 1875 he was Lister's dresser, and in 1876-77, his clinical clerk. When Lister accepted the Chair of Surgery at King's College Hospital, he brought with him four of his students - Sir W. Watson-Cheyne as house surgeon, Dr. Stewart as senior clerk, Mr. W. H. Dobie and Mr. James Altham as dressers.

Lister and John Stewart were close friends as long as they were together in life. At the time of Lister's death in 1912, of the innumerable obituary notices which appeared at the time, the Editors of the Edinburgh Medical Journal later stated that none was more spontaneous, more gracious, or more beautifully phrased than that sent by John Stewart.¹

The Origins of Modern Surgery

Stewart arrived in Edinburgh at a most exciting time. We must remember that 100 years ago

medicine had made little progress since Biblical times. Treatment had changed little since the days of Hippocrates. Surgeons continued to perform the same operations in much the same way as Aesculapius at the Siege of Troy. At the time Stewart joined Lister in Edinburgh, the physicians of the day bled and blistered for all manner of ailments, and surgeons doffed their frock coats to lop off limbs in sawdust-sprinkled arenas.

In 1875, however, the signs of change were evident. In 1863 Florence Nightingale had made nursing an honourable profession. In 1865 Joseph Lister performed one experiment which initiated the era of modern surgery. His methods brought diseases of bones and joints, the abdomen, thorax, brain, the blood vessels and heart within the scope of effective treatment. Later, medicine emerged from the swamps of empiricism and whole new disciplines developed - pathology, bacteriology, virology and biochemistry.²

Lister, while a student at University College in 1846, had witnessed the first operation performed under general anaesthesia in Europe - an operation performed by Joseph Liston - a few weeks after the first operation under ether anaesthesia was performed by Dr. John C. Warren at the Massachusetts General Hospital.

Application of Discovery in Basic Science to Patient Needs

Lister realized that the road for surgery was straight ahead but for the ever-present menace of sepsis. James Spence, Professor of Surgery at Edinburgh, wrote in his textbook of surgery in 1864. "The edges of a wound may adhere and become incorporated, but this is rare, except in the most trifling incisions."

*Professor of Surgery, McGill University, John Stewart Memorial Lecturer 1965.

**Supported by grants from the Medical Research Council of Canada and the United States Public Health Service.

By contrast, Professor Illingworth of Glasgow wrote in 1964, "If the margins of a clean incised wound are accurately co-apted, healing takes place with little disturbance." The difference is the result of the work of Lister and his students.

Lister accepted the Chair of Surgery, Glasgow, in 1860. Most major hospitals of the day had only one operating room, and this was used no oftener than once a week. In the year 1860, 200 operations were performed at the University College Hospital, London. Forty percent of patients coming to amputation died of suppuration, pyæmia, hospital gangrene and erysipelas.³

While Lister was pondering this problem, his colleague, Thomas Anderson, the Professor of Chemistry at Glasgow University, drew his attention to the work of Louis Pasteur which supplied the essential clue. Pasteur had shown that fermentation in urine was not a chemical process as had previously been believed, but was caused by minute living organisms or germs which were widely disseminated in the air. Pasteur proved his contention by boiling culture media in a number of long-necked flasks which could be sealed by melting and drawing out the glass. The fluid remained unaltered unless the flasks were unsealed. When the flasks were later unsealed by breaking the neck, air rushed into the partial vacuum. Pasteur found that such of his flasks as were opened thus in dusty city rooms at once became contaminated so that the fluid rapidly putrefied and decomposed, while those which were opened in the purer air of the Alps (actually on a glacier in Switzerland) showed no alteration.

Experiments of an even simpler nature were carried out by Lister. He boiled urine in a series of flasks, some of them having straight necks, others with necks bent and twisted at various angles. Into those having straight necks dust entered readily and the fluid decomposed, but as the dust was trapped in the curves and angles of the other flasks, the fluid remained germ-free and did not decompose.

Lister had at once recognized in the original experiment of Pasteur the element lacking in his solution to the problem of suppuration. Clearly, Lister argued, it was not the air alone which caused trouble, although other surgeons, fearing the entrance of air into the wound which they treated, had attempted to seal the wounds with collodion and other substances in order to exclude the air. Was it not possible that the minute organisms in air which produced fermentation in certain fluids, also caused putrefaction in wounds? If the blood clot, which was Nature's dressing, could be prevented from putrefying, then all those dreaded complications might be avoided.

It was clearly impossible to kill the germs by means of heat as Pasteur had done in his experiments with the flasks; some chemical substance must be used. He noticed in the newspaper accounts of the use of carbolic acid for sewage treatment to destroy entozoa causing disease in cattle grazing in neighbouring pastures.

A major medical problem of the day was compound fracture which Lister likened to his flasks into which microorganisms had direct access, and suppuration of bone always followed. In contrast, simple fractures were analogous to his flasks with long-drawn-out necks into which germs did not have direct access. By excluding the germs from the wound and killing any which had already gained access, a compound fracture might be rendered as harmless as a simple fracture.

The crucial test came in March, 1865, and proved a failure. On August 12, 1865, James Greenlees, aged 11, entered with compound fracture. Treatment of this patient and ten additional cases seen over the subsequent two years consisted of a thorough application of undiluted carbolic acid to all parts of the wound, which was then dressed with lint soaked in the same fluid. Mixed together, the blood and carbolic acid formed a scab or crust which did not putrefy. Ten of the eleven patients survived - one patient required amputation - an unbelievable accomplishment for the time. It is of interest that as late as 1885, William Stewart Halsted, while still in New York before his move to Johns Hopkins, performed surgical operations in a large tent on the grounds of Bellevue Hospital, having found it impossible to carry out antiseptic precautions in the hospital where anti-Listerian surgeons predominated.

Intensive Care

The first lesson in intensive care so vividly established by Lister is that important discoveries in treatment are made on very few patients. Intensive care is a personal and constantly changing pattern of care carefully individualized for patient needs and the state of our knowledge.

Patient care which is dictated entirely by past experience, despite the numbers of patients involved, ignores the rapidly advancing body of knowledge in medicine. Any number of surgeons were living at the time of Lister's discoveries who treated more compound fractures in one year than he did in his lifetime, but they didn't treat them as well. Dominique Jean Larrey, surgeon to Napoleon's army, performed 200 amputations in one day during the Battle of Borodino during Napoleon's Russian Campaign.⁴ Intensive care implies a quality of care made possible by discoveries in biologic sciences applied at the bedside.

In what situations today are such discoveries being applied to patient care? Let us suppose a patient in shock is presented to us for care. What

we wish to see is a patient with a normal blood pressure, a central venous pressure of approximately 10 cm. of water, a urine flow of 50 ml./hour, a cardiac index greater than 3.2 liters/minute M^2 , an arterial blood pH of 7.4, pCO_2 of 40 mm. Hg. and a pO_2 of 100 mm. Hg., while the patient is breathing air, and a falling arterial blood lactate that is not too far above 12 mg. %.

It is surprising how recent and how useful these measurements are. Harvey Cushing introduced the Riva-Rocci apparatus for determining arterial blood pressure to North American medicine about 1901.⁵ He had, together with E. A. Codman, previously established the practice of recording the patient's pulse and respiration on the ether chart during surgery. At a surgical meeting in Cleveland in 1902, Cushing became involved in a heated discussion with George Crile Sr. over the best instrument for the measurement of blood pressure. They were interrupted by W. T. Councilman of Johns Hopkins who stated, "What has this to do with the practice of surgery?" He shortly became interested and invited both Crile and Cushing to give a practical demonstration of their methods. It took from 1733 - a period of 168 years - when Stephen Hales first measured the blood pressure in a horse, to apply the method clinically. Hales plunged a glass tubing at least 11 feet long into the carotid artery of a horse placed on its side. One historian stated that "The method was extremely inconvenient and required patience on the part of the operator."⁴ Shortening this time lag between discovery and clinical application should be a major responsibility of our universities, and we would like to think that progress has been made in this regard.

I think our training programs in surgery should recognize the rapid advances in medical science and plan for the future. One must recall the story of Dr. Fred Foley of St. Paul, who was trained at the Peter Bent Brigham Hospital in Boston. Following his training there with Dr. Harvey Cushing in neurosurgery, Dr. Foley came back to his native St. Paul, Minnesota, and went out to the City and County Hospital to see Dr. Ancker, the Director and Chief Surgeon. Dr. Ancker was a little hard of hearing, and when Dr. Foley said he was interested in neurology and neurosurgery, Dr. Ancker understood him to say urology and said he had an immediate opening. Dr. Foley, being a surgeon and accustomed to making his mind up readily, said he would accept the position. Dr. Foley has been a leader in urology ever since. I am not at all certain that we prepare our trainees for the future as well as did Dr. Cushing.⁶

Blood transfusion occupies a place of special importance in intensive care. Sir Christopher Wren, the most celebrated of British architects, in

1657 first injected various medicines into the veins of animals, thus producing vomiting, purging, intoxication and other conditions according to the nature of the substance injected. On June 15, 1667, Jean Baptiste Denys transfused a boy of 15 years with blood from an artery of a lamb. Later the same year Richard Lower and a colleague made a direct transfusion in London from a sheep to a man, and three weeks later they gave the same man another transfusion without ill effects. In the following year (1668) one of the patients transfused by Denys died. The patient's widow brought an action against Denys, but it was ultimately established that the death was due to arsenic administered by the widow herself.

The first really successful transfusion for therapeutic purposes was performed by James Blundell, physician and obstetrician to Guy's Hospital. By many experiments on animals he established the fact that blood from one species of animal is incompatible with the blood from another. He, therefore, rightly decided that for the transfusion of human subjects human blood must be used. In 1818 he carried out a transfusion in a patient suffering from an incurable disease; the blood was drawn from several of Blundell's assistants and a syringe was used to transfer it from donor to recipient. Blundell repeated this experiment in 19 hopeless cases, and in 1820 he first tried it on a patient who had a faint chance of recovery. The woman suffering from postpartum hemorrhage was transfused with 8 ounces of blood from the arm of Blundell's assistant. The procedure required 3 hours but was completely successful.

Hemolytic shock, which was often fatal, was encountered and transfusion as we now know it was made possible by the description of the blood groups by Karl Landsteiner, for which he was awarded a Nobel Prize in 1930.

Many important advances followed the availability of blood. The demonstration in dogs, that traumatic shock was hypovolemic shock, by Blalock in 1930, and separately by Phemister and Livingston, is probably the most significant advance in the field of shock to date in the twentieth century. Blood is now used promptly and in large quantities for patients in traumatic shock. The average amount of blood given to a wounded soldier in Viet Nam in 1966 is 11 units. Vasoactive agents are wisely avoided for these problems of hypovolemia. The average time from wounding until a soldier is under intensive care in a major hospital is now one hour in Viet Nam.

Modern surgery is dependent upon blood, as are most pump oxygenators and hemodialysis units. Having recently witnessed a porcine liver perform the necessary hepatic function for a man in acute liver failure, I noticed even this experiment required some blood for priming.

C.O. (15 years) SEVERE ARTERIAL INJURY BOTH THIGHS: SHOCK: ACUTE TUBULAR NECROSIS

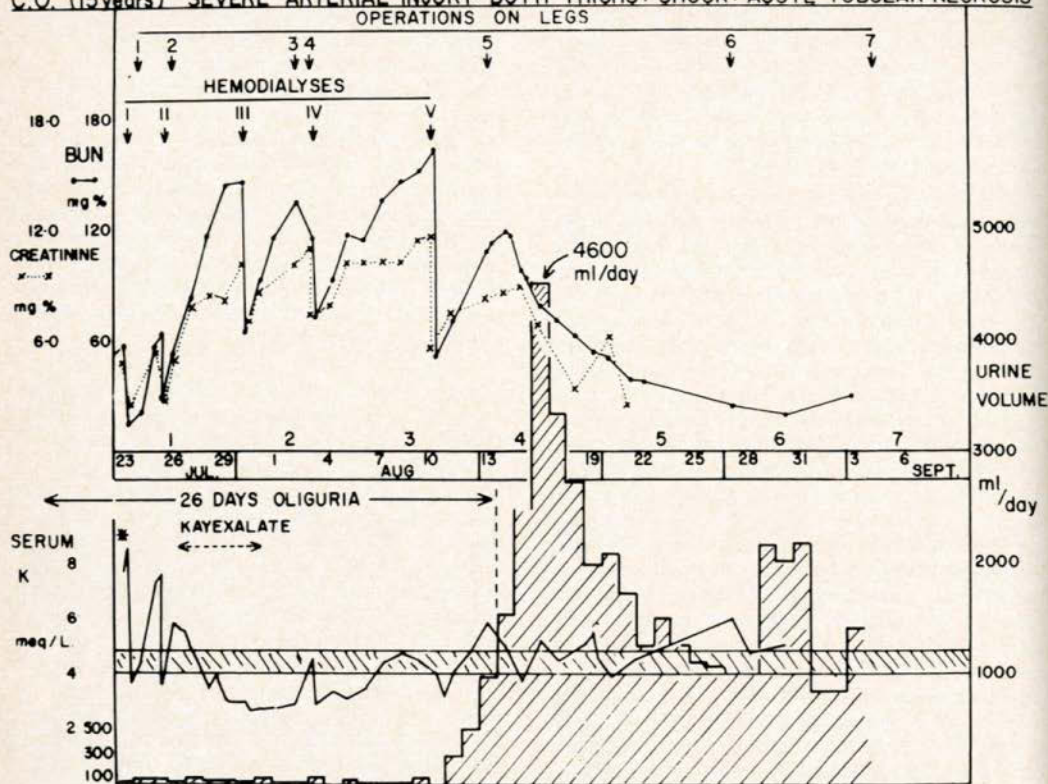


Fig. 1. The clinical course of a patient with acute renal failure secondary to a severe crushing injury. The patient was maintained on hemodialysis during a 26-day period of anuria during which time five operations were necessary. The patient recovered.

What is intensive Care Today?

Until a few years ago, we measured only temperature, pulse rate, blood pressure and respiratory rate in seriously ill patients. While most treatments can be decided upon with some clinical know-how combined with these measurements, there is a group of patients after surgery, injury, or serious infection, who require more sophisticated assessment.

One of the simplest and most informative additions to the above list is the hourly measurement of urine flow. If one can avoid overloading the circulation in patients with oliguria or anuria, most will recover. Other forms of therapy become available for those who do not have an early diuresis. Figure 1 illustrates the recovery of a patient with acute tubular necrosis secondary to trauma who excreted no urine for three weeks.

Measurement of central venous pressure has permitted one to make an early and continuous assessment of the hemodynamic state of the poor-risk or seriously ill patient. The patient with a low C.V.P. and low blood pressure is usually hypo-

volemic. If the C.V.P. is high and the blood pressure is low, a cardiogenic cause is likely. The patient with a low C.V.P. and low blood pressure who does not respond to transfusion probably has peripheral pooling. Treatment is quite different for these three hemodynamic states that require at least a measurement of C.V.P. to detect. Figure 2 illustrates a patient in severe shock whom some might wish to transfuse or others to administer a vasoconstrictor. The studies performed indicated that a cardiogenic mechanism was the cause and these treatments would be contraindicated. Prompt recognition of the hemodynamic cause of shock is frequently required in the injured and in the patient undergoing surgery. If one recognizes the cause, treatment can be lifesaving. Figure 3 illustrates acute cardiogenic shock due to hypoxia in a patient undergoing lung transplant. Blood transfusion, or use of a peripheral vasoconstrictor, would be harmful. A drug which increased the force and rate of myocardial contraction was lifesaving and obviously what was needed on the basis of the C.V.P. and blood pressure.

PERITONITIS

Mrs. M.H.

	BLOOD		ISUPREL	2 days
B. P.	30/25	35/30	60/40	66/40
C.V.P.	10	13	10	6
C.O.	1.9	2.58	4.85	3.5
T.P.R.	.31	.35	.32	.55
pH	7.36			7.4
LACTIC ACID	50	55	58	20
URINE	0	20	50	50

Fig. 2. A summary of blood pressure (B.P.), central venous pressure (C.V.P.), cardiac output (C.O.), total peripheral resistance (T.P.R.), arterial blood pH, lactic acid and hourly urine output in a patient under treatment for shock. The low blood pressure is due to poor cardiac output which responds to treatment with isoproterenol. The cardiac output rose and arterial lactate fell with this therapy.

RESPIRATORY FAILURE

TIME:	3:00am	4:00am	5:00am	6:00am	
B. P.	90	80	40	80	100
C.V.P.	10	20	40	10	17
PO ₂	78	60	51	52	211
PCO ₂	67	71	78	90	38
pH	7.328	7.26	7.28	7.15	7.50

OPERATION ISUPREL TRANSPLANT FUNCTIONING

Fig. 3. The blood pressure (B.P.), central venous pressure (C.V.P.), arterial blood pO₂, pCO₂ and pH in a patient undergoing lung transplant. Cardiac support again permits completion of the operation and correction of the abnormal blood gases. Prompt recognition of the hemodynamic problem, i.e., a high C.V.P. with a low B.P., permitted correct and life-saving therapy.

Many, if not most, serious clinical problems requiring intensive care have as their cause a failure of adequate blood flow. The measurement of blood flow at the bedside in seriously ill patients was made possible by the development of the dye-dilution technique for measuring cardiac output. This principle was first described by Professor G. N. Stewart of Western Reserve University in 1897.⁷ He injected an easily detected substance (sodium chloride) into the right side of the heart where it was well mixed before sampling in the arterial tree. He measured the arterial blood for the substance before and at a known time after the venous injection. The difference in concentrations gives one the dilution and therefore, knowing the quantity of solution which has run into the heart, he was able to calculate the output in the given time. Dickinson Richards first used this technique on victims of trauma in the emergency room of Bellevue Hospital in New York in 1944.⁸ Figure 4 illustrates a poor-risk patient in whom the measurement of cardiac output predicted difficulty. We know that measurement of flow can be helpful in the patient already in difficulty as a guide to therapy. Perhaps in the future we will use this method to warn of impending difficulty.

Mrs. E.C. age 75 CARCINOMA OF CECUM

TIME	11:00 am	1:35 pm	1:37 pm	4:00 pm
R _x	PRE-OP	PENTOTHAL ANECTINE CURARE	TRENDELENBERG POSITION	BLOOD x 3
B.P.	100/45	57/30	75/35	125/75
C.V.P.	0.5	2.5	-	15
C.O.	3.5	1.9	2.4	2.14
C.I.	2.2	1.2	1.5	1.4
P.R.	1475	1400	-	2950
LACTATE	8.4	-	-	23

CARDIAC ARREST next day

Fig. 4. The blood pressure (B.P.), central venous pressure (C.V.P.), cardiac output (C.O.), cardiac index (C.I.), peripheral resistance (P.R.) and arterial blood lactate in a patient who developed a low output syndrome during surgery. The recognition of this syndrome in patients who have a normal blood pressure will decrease the incidence of unexpected cardiac arrest. This patient had at 4:00 p.m. on the day of a colon resection a normal blood pressure, a high C.V.P., indicating that hypovolemia had been corrected, but a very low C.I. The patient had a cardiac arrest the next day which should have been prevented by earlier cardiac support.

The measurement of arterial blood gases and pH is important and at a stage of development in general hospitals that the measurement of serum potassium was immediately after the introduction of the flame photometer. A falling pO_2 in a seriously injured or postoperative patient demands prompt treatment. The cause may be hypoventilation, retained secretions, pain or other mechanisms affecting ventilation, diffusion or perfusion of the lung. If treatment does not correct the abnormality, assisted ventilation is resorted to early before clinical signs or even cardiac arrest supervene. The first sign of inadequacy of ventilation in a patient with a flail chest is hypoxia; hypercarbia is a late sign. Tracheostomy has risks as well as great benefits. Exposure of the bronchial tree to infection should be avoided if possible. We seldom perform tracheostomy for a patient who can maintain normal blood gas values even if this requires placement of an endotracheal tube for several days.

The arterial blood pH, when measured in a poor-risk patient who has not received intravenous sodium bicarbonate to correct the acidosis, will reflect that patient's state of perfusion. Before rushing a patient with severe acidosis to the operating room to relieve the bowel obstruction, experience now tells us that the pH should be corrected and total flow to his bodily tissues improved. Ideally, the blood pressure should be normal, the central venous pressure 10 cm. of water, the cardiac index over 3.2 l./M²/min., the arterial blood gases and pH normal, and lactate falling. These are important parameters to consider in preoperative preparation. The results, of those who believe they can complete the operation before the pH knows what happened, do not justify their vigor.

What of the Future?

I visualize the immediate future of intensive care taking two paths. One, which has proven itself, is the application of engineering principles to medicine. Many worthwhile developments are now established, among them the electrocardiograph, cardiac monitors, respirators, cardiac pacemakers, pump oxygenators, and hemodialysis apparatus. Others in the experimental stage are artificial hearts, equipment analogous to the artificial kidney for liver failure, automatic equipment to assess individual organ function, and, of course, the computer analysis of patient problems.

The other approach to intensive care - quite opposite to bioengineering - is transplantation. The idea is to replace worn out organs rather than utilize artificial substitutes.

Many early experiments in grafting tissue from one animal to another demonstrated the fact, now so familiar, that one living being will not accept cellular tissue from another without a battle.

The new host is a hostile one; he regards the strange tissue as foreign or "non-self." Questions of great concern until recently were: What is the nature of the rejection process? Is it something new and different in all biology, or is it a new aspect of a familiar biological reaction. Is the rejection process subject to scientific analysis?

The success of autografts was established by Boronio in 1804 on sheep. The failure of homografts was apparent from the work of Lexer. In 1927 Bauer showed that skin grafts between identical twins "took". When Emile Holman described the second-set phenomenon in 1924 the stage was set for a more complete understanding of the immune process concerned with homograft response. One of Holman's patients, while he was still a surgical resident, was a 28-month-old child with extensive burns of the face and body which required skin grafts. As he recorded: "On April 3, donor J. W. contributed 9 homografts; and donor E. H. contributed 12 homografts. On April 21, when all homografts of J. W. and E. H. were thriving and spreading nicely, a third donor, M. F., contributed a group of 9 homografts. On April 25, donor E. H. contributed a second group of homografts.

On May 2, the homografts from J. W. and the first homografts of E. H. showed signs of beginning rejection. Moreover, the second homografts from E.H. applied on April 25 were being rejected. During this time of developing rejection of all homografts from J.W. and E.H., the homografts of a third donor, M.F., were thriving and spreading. However, about May 14 they too began to melt away."⁹

Between 1925 and 1945, it gradually became evident that transplanted tissue must contain antigens which arouse an immune response in the new host. Between 1945 and 1960, when Medawar and Burnet were awarded the Nobel Prize, it was established by them and their colleagues that the homograft barrier could be understood, analysed and even battered, broken and crossed. Burnet had suggested that antigen presented to the infant in utero is recognized as self and would not be re-rejected when future contact occurred. Medawar proved it.

Schwartz and Dameshek in 1959 showed the way to a practical, if not complete, solution in the form of "drug-induced immunological tolerance" or immunosuppression with drugs.¹⁰ One should note a quotation from C. P. Snow¹¹ in the same year, "In 1933, four years before his death, Rutherford said, firmly and explicitly, that he didn't believe the energy of the nucleus would ever be released - and nine years later in Chicago, the first pile began to run. That was the only major bloomer in scientific judgment that Rutherford

ever made. It is interesting that it should be at the point where pure science turned into applied."

Seven years later transplantation has been successfully applied to hundreds of patients with terminal renal failure.

Few predicted the degree of immediate success of renal transplants in man. I suspect that John Stewart would have encouraged a try even knowing that in nature nothing can be given, all things are sold. □

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Dalhousie Notes - 1967

I. HOW MANY MEDICAL SCHOOLS ARE NEEDED IN THE ATLANTIC PROVINCES? (PART I)

C. B. STEWART, MD., DEAN

Halifax, Nova Scotia

Introduction

There has been much discussion in recent months about the need for new medical schools in the Atlantic Provinces. Both Newfoundland and New Brunswick are considering this matter. Some of the interest was stimulated by the Royal Commission on Health Services which suggested that a French-language medical school be located in Moncton.¹ Some may have been the outcome of a prediction that the number of students seeking admission to Medicine at Dalhousie would exceed the capacity of the new Sir Charles Tupper Building shortly after it would be opened in 1967, while the size of the teaching units in the Halifax hospitals would limit further increases in the enrolment of this Faculty.²

In Newfoundland a one-man Commission on Health was appointed in 1965 and Lord Russell Brain has submitted a two-volume report to the Government.³ Memorial University has also received a report from a Committee under the Chairmanship of the late Dr. J. A. MacFarlane.⁴ In New Brunswick a Medical School Survey Committee has been set up by the government under the chairmanship of Dr. Ross Flemington, former President of Mount Allison University. Public hearings have been completed and a report is being prepared.

Some of the experience of Dalhousie University may have been of value to those who have been considering the desirability and feasibility of new medical schools. The Dean was an advisor to the Memorial University Committee and submitted material to Dr. MacFarlane, part of which was published as an appendix to his report.⁵ This material has recently been brought up to date and some new data provided for the New Brunswick Committee.

Because of the interest of the medical profession of Nova Scotia in medical education and more specifically in Dalhousie, the material in this brief to the New Brunswick Committee will be presented in the next few issues of the Bulletin, divided because of its length into several installments.

* * * * *

The Faculty of Medicine of Dalhousie University has given thoughtful consideration to the need for enlarging the program of medical education and research in the Atlantic Provinces and the methods for doing so. This has been under periodic study since 1959, when it first became obvious that the facilities then available at Dalhousie would soon be inadequate to cope with the needs. As a result, an enlargement of the Dalhousie Medical School was then planned. However, it soon became clear that a second medical school might also be required. Before this subject came under serious review either in Newfoundland or New Brunswick, the Faculty of Medicine of Dalhousie University had considered a report from the Dean suggesting that a larger expansion at Dalhousie or a second medical school would be required in the near future to serve the Atlantic Region. After consideration of this report, the Faculty of Medicine decided to limit the enrolment at Dalhousie Medical School to a class of approximately 100, the size being determined largely by the capacity of the teaching units in the affiliated hospitals.

It is therefore a clear policy of the Faculty that all programs of medical education and research for the region need not be centered at Dalhousie. We would encourage, and insofar as possible assist in, the establishment of a second medical school in the Atlantic Provinces as soon as possible.

On the other hand, we believe that, with the completion of the Sir Charles Tupper Medical Building in 1967, this enlarged medical school and one additional institution will be adequate to meet the needs of the region for the foreseeable future. Available evidence strongly suggests that there will not be a sufficient number of students entering medicine to warrant the establishment of three medical schools. It is well known that there is not a sufficient number of well qualified medical teachers in Canada to staff new and expanding schools. In addition, the capital and operating costs of three medical schools would be almost prohibitive.

It is our belief that a second medical school will be required shortly after the new Sir Charles Tupper Medical Building is opened, probably as early as 1970. Since the planning of the curriculum, the construction of necessary buildings and the recruitment of staff will require several years, it is urgent that a decision should be reached as soon as possible as to the site of the second medical school. Although the need is not so urgent that a "crash program" is required to organize such a new school on an emergency basis, there should be no delay in the matter because of the long planning period that is necessarily involved.

Many arguments for establishing a medical school in New Brunswick have been presented to your Committee, and for or against specific locations. We do not intend to enter into this controversy. Dalhousie University would be equally happy if a second medical school were located in any suitable center in New Brunswick or in Newfoundland, but it is our duty to warn the Committee that the establishment of several small schools would in our opinion seriously endanger the quality of the educational programs of all. Furthermore, the Board of Governors of Dalhousie University accepted responsibility for a huge capital debt in order to expand the Medical School to serve the whole region at a time when neither the Governments, the public or the medical profession of New

Brunswick or Newfoundland showed any interest in establishing their own medical schools. We believe it is only fair to expect an adequate degree of public and governmental support for the Dalhousie Medical School so long as it continues to serve the Atlantic Region, or a major part of it.

The main questions on which Dalhousie University wishes to comment are:

- (1) Does the number of prospective medical students warrant the establishment of one or two additional medical schools in the Atlantic Region?
- (2) To what extent does the shortage of physicians in this region warrant expansion of training facilities?
- (3) To what extent does the location of a medical school within a province assist in recruiting and retaining practitioners in that province?
- (4) What are the admission policies of Dalhousie and other Canadian medical schools with respect to New Brunswick students?
- (5) What are the financial implications?

1 The Supply of Students:

As the first step in evaluating the need for other medical schools, it would seem desirable to consider how effective one medical school has been in meeting the needs of the Atlantic Region. For almost 100 years, Dalhousie University has had the only medical school in the four Atlantic Provinces. It was established in 1868, first as a faculty of the University, then as the Halifax Medical College, rather loosely affiliated with Dalhousie, and finally, after 1910, again as a University faculty. This re-assumption of responsibility by the University came after severe criticism of the Halifax Medical College by the Flexner Report of 1910.

The modern system of inspection of medical schools was established some time after the Flexner Survey. Dalhousie Medical School gained full accreditation during the 1920's, and has continued to enjoy that status for more than forty years. Although it always had some students from the

TABLE I
ENROLMENT* OF ATLANTIC PROVINCE RESIDENTS IN DALHOUSIE MEDICAL SCHOOL
NUMBER AND PERCENTAGE FROM EACH PROVINCE

Year	No. & Percentage of Atlantic Province Enrolment								Total Atlantic Provinces
	from N. S.		N. B.		Nfld.		P. E. I.		
	No.	%	No.	%	No.	%	No.	%	
1954	110	47	60	25.6	34	14.5	30	12.8	234
1955	109	45.8	54	22.7	46	19.3	29	12.2	238
1956	108	47.8	50	22.1	40	17.7	28	12.4	226
1957	108	47.2	53	23.1	39	17	29	12.7	229
1958	109	50.9	49	22.9	27	12.6	29	13.6	214
1959	106	52.2	41	20.2	30	14.8	26	12.8	203
1960	106	53.8	39	19.8	26	13.2	26	13.2	197
1961	96	48.5	41	20.7	34	17.2	27	13.6	198
1962	94	46.8	39	19.4	43	21.4	25	12.4	201
1963	94	43.5	55	25.5	43	19.9	24	11.1	216
1964	112	46.5	54	22.4	48	19.9	27	11.2	241
1965	128	47.4	60	22.2	58	21.5	24	8.9	270
1966	148	50.3	64	21.8	60	20.4	22	7.5	294

*Enrolment in the five years, including internship, excluding out-of-region students.

neighbouring provinces, 90 per cent of the enrolment was from Nova Scotia in 1910. The proportion from other provinces grew rapidly after Dalhousie became an accredited school in the 1920's. During the past twenty years, Dalhousie has enrolled more than 90 per cent of the English-speaking students from the Atlantic Region who have chosen medicine as a career. The proportions from each province have varied somewhat but on the whole have remained surprisingly stable (Table I).

The enrolment of Atlantic Province residents decreased from 238 in 1955 to 197 in 1960, then went up rapidly to 294 by 1966. Since the total size of the entering classes remained about the same, it is obvious that the chief fluctuation was in the number of non-residents admitted to fill the classes in "slack" years. The five-year averages for 1954-58 and 1959-63 and the three-year average 1964-66 show that 23.3, 21.1, and 22.1 per cent of the regional students came from New Brunswick in these three consecutive periods. Nova Scotia's proportional enrolment in the same periods was 47.7, 48.9 and 48.1 per cent. Newfoundland's increased from 16.2 to 17.3 to 20.6 per cent and Prince Edward Island's declined from 12.7 to 12.6 to 9.2 in the three time periods shown above.

Since exactly the same criteria were used for evaluating the students from all four provinces during these years, the relatively small fluctuations were due to the number and quality of applicants, not to the admission policies of the school.

The Medical Schools of Canada are asked each year to send a list of first year students with home address to all other schools. From these lists have been compiled the following data on all Atlantic Province students admitted to Canadian medical schools. (Table II). A few other students may have been educated in the United Kingdom, Ireland and continental Europe, but the number is relatively small; in fact, almost none are from New Brunswick or Nova Scotia. There are also few if any admissions to U.S. medical schools.

This table shows that relatively few Atlantic Province students enter Canadian medical schools other than Dalhousie. The average is slightly more than 6 per year in the English-language schools but most of these, about 65 per cent, are from New Brunswick. The French-language schools enrol between three and four per year on the average, and 74 per cent are from New Brunswick. Just over 90 per cent of the English-speaking medical students of the four provinces enter Dalhousie or 86 per cent of the total, but New Brunswick has the lowest proportion, 78 per cent of its English students or 70 per cent of the total.

According to news reports, the Saint John medical committee interpreted the low enrolment in other medical schools to mean that there is a policy in all Canadian medical schools to limit enrolment of out-of-province students. This is a misinterpretation of the statistics. The plain fact is that most New Brunswick students did not apply to medical schools other than Dalhousie. The Dalhousie application forms record this fact. Of those who did apply and were accepted elsewhere, most were also notified of acceptance by Dalhousie and the majority chose to come to this school. The statistics show student preference, not limitation of admission policies.

Dalhousie itself has not in the past 20 years, and so far as can be determined has never, given preference to Nova Scotian students over residents of New Brunswick or the other Atlantic Provinces. With great regret we had to threaten such a limitation in 1965, as will be described under finances, but it was not put into effect.

A newspaper report also quotes the Saint John medical committee as "expressing the belief that 'there will always be a limitation' on the number of New Brunswick medical students admitted to Dalhousie". There has never been a limitation in the sense of a quota. Any limitation has been based on the academic qualifications of the students in competition with those from the other three provinces, and New Brunswick students have

TABLE II
NUMBER OF STUDENTS FROM THE ATLANTIC PROVINCES ENROLLED IN FIRST YEAR AT
CANADIAN MEDICAL SCHOOLS 1954 TO 1965

Year	Nova Scotia			New Brunswick			Nfld.	Fr.	Dal.	P. E. I.		
	Dal.	Eng. Can.	Fr. Can.	Dal.	Eng. Can.	Fr. Can.				Dal.	Eng. Can.	Fr. Can.
1954	17	4	—	13	5	—	6	—	—	8	1	—
1955	26	—	—	9	7	1	15	—	—	4	—	—
1956	23	—	1	10	5	3	3	1	—	7	1	—
1957	27	1	1	14	3	4	6	1	—	7	—	—
1958	28	1	1	7	2	4	4	1	—	5	—	—
1959	15	—	1	9	5	1	8	3	—	6	—	—
1960	18	—	1	8	5	1	8	4	—	8	—	—
1961	19	2	2	13	5	5	13	—	—	8	—	—
1962	26	—	—	19	2	2	11	1	1	7	—	—
1963	27	—	2	22	1	7	6	—	—	3	—	—
1964	34	2	—	12	5	2	12	1	—	6	—	—
1965	36	1	—	11	1	2	19	2	—	4	—	—
Totals	296	11	9	147	46	32	111	14	1	73	2	—

Totals Dalhousie - 627; English Canadian - 73; French Canadian - 42.

shown up very satisfactorily in such a competition. Of course the total capacity of Dalhousie Medical School is limited, and even if all of the students were to be selected from New Brunswick, the above-quoted statement that "there will always be a limitation" would be literally true, but at the same time it is in fact grossly misleading. It suggests a quota system or a discrimination against New Brunswick students that has never existed. Dalhousie University has not sought praise for its service to the Atlantic Provinces, but we resent being maligned.

There may be some Canadian medical schools that have geographic limitations on their enrolment, just as Dalhousie gives priority to Atlantic Provinces residents, but this is not the chief factor in limiting enrolment of students from this region in the other English-language medical schools. McGill, for example, certainly has no limitation against qualified students from New Brunswick. On the other hand, the small number of French-speaking students in Laval and Montreal may be due in part to a limit on the enrolment of out-of-province students. We do not have exact information on this problem.

Dalhousie has rejected most candidates from the small classical colleges of New Brunswick (and of Nova Scotia) because their scientific background was inadequate. However, we have admitted some of these students after one additional year in science at Dalhousie, U.N.B., St. Francis Xavier or other acceptable university. Our admissions policy has in this respect been the same as that of the University of Montreal. There has been no discrimination because of language but adequate academic standards have been maintained.

It is worthy of note that between 1924 and 1964, a forty-year period, there was only one short interval after World War II when Dalhousie Medical School was unable to meet all of the demands for the placement of qualified students from the four Atlantic Provinces. From 1945 to 1949, Dalhousie was in the same difficult position as other North American universities as a result of the influx of veterans. A number of qualified students were unable to gain admission to the Faculty of Medicine at that time. However, from 1951 to 1964 not a single applicant from the four provinces was rejected who had met the Dalhousie premedical requirements and was judged by the Admissions Committee to have a reasonable chance of success in the study of medicine. Because admission requirements vary from one medical school to another and there are no absolutely infallible standards, there may have been a few of these rejected candidates who were in fact successful in the study of medicine at other centers. However, the number is believed to be very small.

It is concluded that, although there has always been a shortage of doctors practising in this region, this shortage has not been caused by any failure of Dalhousie to educate all of the qualified students who wished to enter medicine between 1950 and 1964.

However, since 1964, the facilities at Dalhousie have been inadequate to take care of the rapidly increasing number of local applicants from the Atlantic Region. A few qualified students had to be rejected in 1964 and somewhat larger numbers in 1965 and 1966. If capital funds had been provided for a new building in 1959, when first requested by the Faculty, the new facilities would have been available in 1964-65, thus preventing the loss of educational opportunities for the students who were rejected in those two years. The Governments of New Brunswick, Newfoundland and Prince Edward Island were approached on this matter but expressed unwillingness to provide capital assistance for buildings in another province. The Nova Scotia Government agreed to provide a grant of \$500,000 per year and to consider further annual grants, which the University hoped might amount to two or two and a half millions. However, it was not until the Centennial Grant of five million dollars was made that Dalhousie was in a position to embark on the necessary building program. Meanwhile, potential enrolment from this region had exceeded the capacity of the school.

Nevertheless, until as late as 1963, it was the opinion of the Dean and the Faculty of Medicine that this one Medical School would be capable of carrying the full responsibility for educating the medical students of the Atlantic Provinces, especially in view of the enlargement that was then being planned in both the Medical School and the teaching hospitals. As already mentioned, trends in enrolment resulted in a further study by the Faculty in 1963 and a recommendation that one other medical school should be established. □

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