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Editorial

For the last time I face a barren sheet of paper upon which I must cause to flow forth ideas like water on an arid soil. (Poetic) Interestingly enough, to gain a degree of Doctor of Medicine it is only necessary to imply that you can utilize the language. By means of a few lucky scratches with a "specially treated electrographic pencil" it is possible to be turned loose on an unsuspecting public. I am thankful that the many contributors to the Journal over the past year have shown a degree of erudition that will form the framework for the highest excellence in medical practice. I am also grateful that they decided to utilize their own Journal for the publication of many thoughtful, polished works that would have graced the pages of many higher priced publications.

It was with great pleasure that we received the two letters printed herein. It shows that we are on the right track in our aims to produce a stimulating and informed publication. The upcoming staff, marshalled by Dave Peachey will, I am certain, carry on in the original spirit which dates back forty years. I must say that it will be with a mixture of nostalgia and relief that I peruse the issues which will emanate from volume 41. I'd better drop this train of thought as it is beginning to sound like a cross between a valediction and a swan song.

In the past years, a lot of thought has been put into the aims, problems and future of medicine and medical education. It is evident that the approach to the basic sciences must be both streamlined and integrated in a systems fashion. This necessitates the abolition of department autonomy where it concerns the structure of undergraduate medical education. This is difficult for some, but through coercion, collusion or eventual elimination we shall have a well organized course which culminates in an effective "clinical clerkship". (I'm not sure why, but that term has a rancid flavour about it.) This, too, necessitates change in status of the clerk. John Evans has proposed a limited licensure, similar to that held by the junior intern presently. This idea is not popular with many of our established clinicians. One said to me that he would not let an intern look after his patients, let alone a fourth year medical student. Further discussions caused him to recall that when he graduated during the war and was suddenly shouldered with responsibility after a training programme that

left him no better qualified than the average final year student, he functioned quite well.

In my mind, another hiatus in the precept that patient care will suffer at the hands of students is the present practice of admitting to intern status physicians from foreign schools who, the calibre of their training notwithstanding, are in some cases unable to understand the patients they are trying to treat. It is both pitiful and frightening to watch an educated man try to communicate through the use of Latin terms while he confuses patients and instructions to a degree that may on occasion be dangerous and even fatal. One can only sympathize with them and condemn a system which forces them to begin the practice of medicine immediately without providing for proper training in the language of their new home. When you look at this situation, the fear of our senior physicians and governing bodies concerning function of final year students becomes ludicrous. A little forethought and planning will allow all medical personnel to maximally contribute to health care in Canada.

What can I, in my lofty position of "clinical clerk" presume to tell anyone aspiring to these heights? Firstly, know your work, especially the reasons and mechanisms behind function and treatment. This is truly one business where a little knowledge is a dangerous thing. Secondly, get to know your patients. Try to understand and appreciate their fears and foibles and be compassionate with them. Thirdly, and this is the most difficult of all, accept your emotions and learn to control them in a beneficial fashion. Try not to develop a calloused shell that allows you to see only the "interesting pathology" before you. At the same time maintain enough objectivity that you can think and act clearly. A medical student who is now a physician once told me, "You're half a man when you can cry; you're a whole man when you're not ashamed of it." But save your tears and your laughter until the job is done. Then God help you: you're on the way to becoming a doctor. Good luck and a fair share of happiness wherever you go.

HRonald Wexler

The Rationale for Therapy of Parkinson's Disease

David Spence, '70

This paper is directed mainly towards the new developments in treatment of Parkinsonian syndromes with L-Dopa. Before we can arrive at an understanding of that most interesting achievement it would be well to briefly review what Parkinson's disease and the extrapyramidal system are. The rationale for surgical treatment will be described briefly in passing.

Paralysis Agitans, or the Shaking Palsy, was described in 1817 by James Parkinson, in a paper entitled, "An essay on the Shaking Palsy". He was the first to describe the major manifestations of this syndrome, which is characterized by tremor, muscular rigidity, and loss of postural reflexes. Not only is it one of the most common of all the basal ganglia disorders, but Parkinsonism is a prominent cause of disability due to diseases of all types. Its prevalence approximates one million patients in the U.S., with the addition of 50,000 new cases each year. The syndrome is found in a number of disease processes, either alone or in combination with other symptoms. In the vast majority of cases no cause has been found. This group is designated as Primary Parkinsonism, Parkinson's disease, or Paralysis Agitans. The cases in which causes have been found are classed as Secondary Parkinsonism. The separation is artificial, as all Parkinsonism may have a common origin. Some examples of Secondary Parkinsonism are: poisoning with carbon monoxide, manganese, or other metals; tumours, trauma, infectious vascular and degenerative diseases in the region of the basal ganglia, and drug-induced, especially with phenothiazine drugs. Only two are frequently encountered: post encephalitic and drug-induced parkinsonism. Paralysis agitans comprises the majority of cases. Onset occurs most commonly between age 50 and 65, affecting both sexes and all races. It begins insidiously with any of its three cardinal manifestations alone or in combination. Tremor, involving the fingers in a pill-rolling motion is the most common initial symptom. Stiffness of the limbs, slowing of activity (bradykinesia), inability to express emotional feeling (mask-like facies), loss of blinking and associated movements such as swinging of the arms when walking, and stooping of the body with a shuffling gait occurs. As the

disease progresses, speech becomes slow and monotonous; there is a tendency to seborrhic dermatitis. The bradykinesia may be truly incapacitating, so that it may take hours to eat a meal or get dressed. In short, it is a devastating disease.

The anatomy of the components of the motor system(s) referred to as extrapyramidal, are represented diagrammatically in Figure 1. The structures of importance are: the caudate and lentiform, which because of their similarities in appearance, structure, and phylogenetic development, are grouped as the striatum, the name deriving from the striated appearance of their connections as they traverse the internal capsule; the globus pallidus, the thalamus, an important way station and integrative region; and the subthalamic nucleus, red nucleus, and substantia nigra, all brain stem centres within the basal ganglia.

These nuclear masses, along with their connections with each other and with certain parts of the reticular formation, cerebellum, and cerebrum, make up an anatomic-physiologic unit that collectively has been termed the "extrapyramidal system". Its role is not definitely known, and can only be inferred from studies of animals in which it is not dominated by the cerebral cortex. In sub-mammalian forms in which activities are stereotyped and resemble patterned reflexes, this system is essential for normal locomotion, feeding, etc. In higher animals, except man, its integrity is necessary for the production of automatic movement and postural adjustments. In man, the system is believed to set the postural tone upon which voluntary movement is superimposed, and to provide a re-enforcing and modulating influence on movements of cortical origin. In this context the role of the extrapyramidal system is AUTOMATIC SENSORIMOTOR INTEGRATION.

From this follows a simplified interpretation of the rationale for surgical treatment of Parkinsonian disorders. As represented in the diagram, modulation of cortical motor activity is modulated through the ventrolateral and ventromedial thalamic nuclei. The pathways traverse the fields of Forel. The reasoning is, grossly simplified: a disorder of modulation produces a disorder of movement; bad

FIG. 1. DIAGRAM OF EXTRA PYRAMIDAL SYSTEM
 - AFTER DAROFF, R.

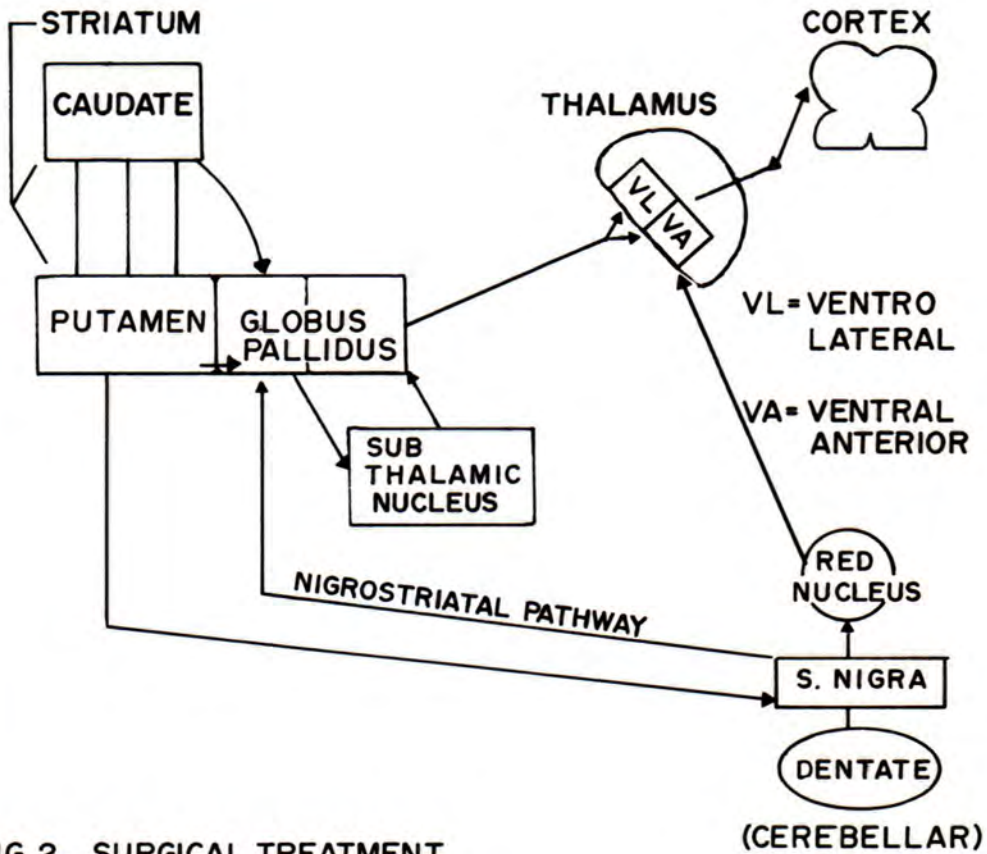


FIG. 2. SURGICAL TREATMENT



information is being transmitted via the thalamus; no information is better than bad information; ergo—take it all away by putting a lesion close to the ventromedial and ventrolateral nuclei (Fig. 2), and the cortex will look after itself. This reasoning has, by Londau² been described as belonging to the "Black Arrow School of Physiology" in a very derogatory way, but it serves as a simple explanation, easy to get a grasp on, and although no information may be better than bad information, one's parietal area is less willing to settle for none, perhaps, than is the motor strip. The "Black Arrow School" is well represented by J. B. Corman in his paper entitled "The anatomic basis for surgical treatment of Parkinsonism", to which Londau's remark refers.

The medical treatment of Parkinsonism depends on the concept that the basal ganglia are influenced by two types of neurotransmitters: an excitatory one, Acetylcholine, and an inhibitory one, Dopamine. The remainder of this paper will be devoted to: the evidence for cholinergic and dopaminergic influences; the way in which a defect in inhibition might arise, and the rationale for treating such a defect with L-Dopa. The review is treated superbly in Klawson's paper, "The Pharmacology of Parkinsonism".⁴

CHOLINERGIC MECHANISMS:

Just over 100 years ago, Odenstein⁵ suggested the use of belladonna alkaloids in treating Parkinsonism. These were used for 75 years without much speculation as to why they seemed to work. Feldberg⁶, in 1945, suggested that a central antagonism between acetylcholine and atropine could be invoked to explain their usefulness.

In 1956, Everett *et al* produced tremors in mice with a cholinomimetic agent, tremorine. The action was central, since tremor was abolished by spinal cord section. Midbrain lesions prevented the tremor, and only Parkinson drugs antagonized it. Ahmed and Marshall⁷ showed a definite relationship between peripheral acetylcholine inhibition, anti-tremorine potency and anti-Parkinson activity.

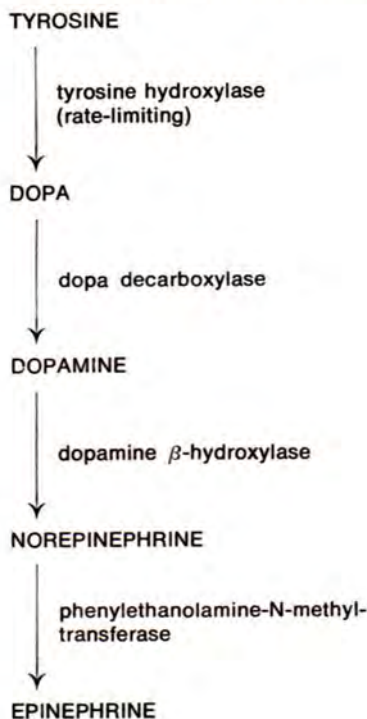
Nashold⁸ injected both acetylcholine and anti-cholinergic drugs directly into the globus pallidus of patients undergoing stereotaxic surgery. Acetylcholine increased contralateral tremor, while anticholinergic drugs decreased tremor.

In 1967, Duvoisin demonstrated the central location of the anticholinergic effect, in patients with Parkinson's disease. He showed that physostigmine increased all the manifestations of disease in untreated patients without giving rise to any new signs

or symptoms, and that this effect could be reversed by benztropine or scopolamine. Further none of these effects could be demonstrated with quaternary anticholinesterases, which do not reach the CNS. He concluded there is a direct and mutual antagonism of physostigmine and anticholinergic drugs on the manifestations of Parkinsonism, and that the antagonism takes place centrally. He extended the theory by suggesting the antagonism takes place in a specific site, the striatum. The striatum contains the highest concentration of acetylcholine in the entire nervous system⁹. It also possesses the highest concentration of both acetylcholinesterase¹⁰ and choline acetylase¹¹. These facts might well suggest the striatum as a site for involvement of the cholinergic system. Duvoisin also suggested that the involvement of the cholinergic system was not primary, but was secondary to involvement of another possible CNS transmitter, dopamine.

This leads us to the consideration of the role of dopaminergic mechanisms in the pathogenesis and treatment of Parkinsonian syndromes. The position of dopamine in the family of catecholamines is illustrated in Figure 3. Evidence that dopamine could exert an effect qualitatively different from

FIGURE 3—THE CATECHOLAMINE FAMILY



norepinephrine has been known since 1942 when Holtz and Credner demonstrated that dopamine has a vaso-depressor effect¹². It has also been shown that the peripheral effects of dopamine are blocked by neither α - nor β -adrenergic blocking agents^{13,14}. Nevertheless, the notion that dopamine might have a role other than just a precursor of norepinephrine was first clearly expressed by Blaschko in 1957¹⁵. The concept that dopamine has a specific function in the CNS also dates from 1957¹⁶.

The evidence which supports this is more impressive than that which supports an independent effect of dopamine in the periphery. It is well documented in Klawon's review¹, and will only be summarized here (Fig. 4.).

1. The first type of evidence derives from studies of concentrations of dopamine and norepinephrine (a) in the brain as a whole and (b) in specific areas of the brain.
 - (a) Dopamine accounts for 50% of total brain catecholamine. This would not be expected if dopamine served only as a precursor, especially if the rate-limiting reaction is tyrosine hydroxylase.
 - (b) The regional distribution of the two catecholamines is markedly different: the greatest concentration of dopamine was found in the striatum which contains little norepinephrine. The excess of dopamine over norepinephrine in the striatum is of the order of 100-fold. In the hypothalamus, there is 10 times as much norepinephrine

as dopamine. In addition, the turnover of dopamine is much faster, even in areas which contain much more dopamine than norepinephrine which makes it very unlikely that dopamine is only an intermediary in the synthesis of norepinephrine.

2. A most important body of information was obtained by the use of fluorescent microscopic techniques which demonstrated a number of mono-amine-containing neural systems, or pathways, within the CNS. In particular, a pathway from the substantia nigra (which had been shown to contain significant amounts of dopamine) to the striatum, was striking, in that:

- (1) The dopamine in the striatum was shown to be located within a meshwork of finely packed nerve terminals, while in the substantia nigra, dopamine was found in the nerve cell bodies.
- (2) Lesions placed in the substantia nigra produce significant loss of dopamine in the ipsilateral striatum.
- (3) Removal of the striatum resulted in a distinct increase in intensity of most cell bodies of the ipsilateral substantia nigra, during the first few days after striatum ablation.
- (4) After 3-4 weeks, loss of fluorescence and neuronal degeneration occurred especially in the pars compacta of the substantia nigra.

These results were felt to be compatible with a nigra-striatal tract with cell bodies in

FIGURE 4—EVIDENCE FOR ROLE OF DOPAMINE

- A—Concentration (1) Dopamine=50% of total catecholamine
 (2) Localization striatum : dopamine=100 NOR
 hypothalamus : NOR=10 X Dopamine

B—Histochemical Fluorescent Microscopy

- (1) Dopamine in cell bodies of S. Nigra, axons of striatum
- (2) Lesions in S. Nigra → ↓ Dopamine in striatum
- (3) Removal of striatum congestion in S. Nigra, at first
- (4) Then see neuronal degeneration in S. Nigra

C—Pharmacologic

Dopamine acts as an inhibitory neurotransmitter in caudate

D—Pathologic

- (1) Lesions of S. Nigra constant, common finding
- (2) Little or no dopamine in striatum
- (3) ↓ Dopamine in S. Nigra + globus pallidus
- (4) No ↓ of Dopa Decarb. or M.A.O.

the substantia nigra and axon terminations in the striatum. The neurons of such a tract contain dopamine.

3. Pharmacological evidence has accumulated, through the efforts largely of Hornykiewicz, and Mehenon and co-workers, that dopamine acts as an inhibitory synaptic transmitter within the caudate nucleus.

4. Pathologic evidence from man provides the link between these experimental findings and Parkinsonian syndromes in patients. In both Parkinson's disease and post-encephalitic Parkinsonism, the most conspicuous site of pathology is the pigmented nuclei of the brainstem, most notably the substantia nigra. Lesions of the substantia nigra are the most constant and characteristic in these conditions. If the dopamine-producing nerve cell bodies are affected in these diseases, one might expect the distal ends of these neurons to be affected; the expectation being that dopamine would be decreased in the striatum. This was demonstrated in some 40 patients by 1966, by Hornykiewicz. Often virtually no dopamine was found. Dopamine was also markedly decreased in the substantia nigra and globus pallidus.

Despite the greatly reduced levels of dopamine in the striatum, levels of dopa decarboxylase and of monoamine oxidase were not decreased.

This leads to the rationale for treatment of Parkinsonian syndromes with DOPA. The usefulness of L-Dopa is felt to arise because increased amounts of dopamine are being formed in the striatum of these patients being treated. This presupposes that L-Dopa is decarboxylated to dopamine in the dopaminergic-denervated stratum; since the necessary enzyme is present in the striatum, there is some reason to think this might occur.

The reasoning just traced through led Hornykiewicz in Austria, and Barbeau, in Montreal, to try DL-Dopa in patients with Parkinsonian syndromes in the early sixties¹⁷. The drug was costly, and was administered in small doses (300 mg.-2000 mg./day) for relatively short periods of time. Encouraging results were described, but side effects and variability of beneficial effect led to widespread scepticism in the Dopa world. Then

Coatras, in Uphaven, N.Y. had the temerity to use much larger doses (3 to 16 grams/day), with results that encouraged him to go on with the work, despite the apparent disapproval of many of his colleagues¹⁸. He obtained large amounts of L-Dopa from Merck, Sharp and Dohme, and the results of his work are reported in the Feb. 13, 1969 issue of NEJM¹⁹. With L-Dopa and a peripheral dopa-decarboxylase inhibitor, and a regime of slowly decreasing doses, he was able to demonstrate remarkably beneficial effects, with very acceptable adverse effects. This work represents a triumph of basic science as applied to people suffering from a disabling disease. But more important, it heralds a whole new era in the area of chronic neurologic disorders not dreamed of until now—the day when a neurologist may be able to do more than diagnose and give supportive treatment.

REFERENCES:

1. Parkinson, J. An essay on the shaking palsy. London: Sherwood Nealy and Jones, 1817.
2. Londau, Wm. Lack of physiologic understanding of basis of surgical treatment of Parkinsonism. *Leaketo*, Ed. NEJM, 280, #25, p.1419, 1969.
3. Cormon, J. B. Anatomic basis of surgical treatment of Parkinson's disease. NEJM 279, #17, p. 919-930, 1968.
4. Klawans, H. L. The pharmacology of Parkinsonism. (a review). *Dis. Nerv. Syst.* 29, #12, p. 805-816.
5. Ordenstein, L. Sur la paralysie agitante et le selerosse en plaque generalisee. E. Montinet, Paris 32, 1867.
6. Feldberg, W. *et al.* *J. Physiol.* 107: 372, 1948.
7. Ahmen, A. and Marshall. *Brit. J. Pharmacol.* 18, 274, 1962.
8. Nashold, B. S. *Proc. Soc. Exp. Biol. Med.* 101: 68, 1959.
9. Feldberg, W. *et al.* *J. Physiol.* 107: 372, 1948.
10. Hebb, D. O. *et al.* *J. Physiol.* 134: 718, 1956.
11. Fahn, S. *et al.* *Brain Research* 7: 323, 1968.
12. Hertz, P. *et al.* *Arch. Exp. Path. Pharmacol.* 200: 556, 1942.
13. Holtz, P. *et al.* *Arch. Exp. Path. Pharmacol.* 246: 133, 1953.
14. Vonov, S. *J. Pharm. Pharmacol.* 15: 723, 1963.
15. Blasehko, H. *Experientia.* 13: 9, 1957.
16. Carlson, A. *Pharmacol. Dev.* 11: 548, 1959.
17. Borbeau, A. L-Dopa therapy in Parkinson's disease: A review of nine years' experience. *CMAJ.* Dec. 1969, Vol. 101, p. 791-800.
18. Coatras, G. C. *et al.* Aromatic Amino Acids and modification of Parkinsonism NEJM 276: 374-379, 1967.
19. Coatras, G. C. *et al.* Modification of Parkinsonism. Chronic treatment with L-Dopa. NEJM Vol. 280 #7, 337-345, 1969.

* * *

GEMS FROM ALL OVER

Dr. J. M. T-----n—During lecture on micturition: 'His mind is somewhat of a void.'
'This lady presented with anemia and now has anitis!'

B. P-----r, C.C.—This lady has a history of pyelonephritis during a pregnancy over the past nine years.

B. T-----s, C.C.—Sex is an epidemiological disease.

L. S. M. D. O-----n, C.C.—It is better to have a licenced M.D. than a trained abortionist.

A Review of the Fetal Membranes and Their Spontaneous Premature Rupture

David K. Peachey, '71

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Knowledge of the physiological activity of the fetal membranes is limited, and many questions remain unanswered. How strong are they? What factors cause them to rupture? Why do they rupture prematurely? Does infection, trauma, or chemical irritation affect their strength? Portions of this paper suggest possible answers to these questions.

ELABORATION OF THE MEMBRANES

(Refer to figures 1, 2 and 3)

Early after implantation, the chorion is covered with villi over its entire surface, forming the *chorion frondosum*. There is a decidual transformation of the endometrial stroma in all areas of the uterus except the cervix, such that the decidual area deep to the chorionic sac is the *decidua basalis* and that lying between the sac and the uterine lumen is the *decidua capsularis*. The decidual tissues bearing no relation to the chorionic sac form the *decidua vera or parietalis*. The chorion related to the decidua capsularis constitutes the *chorion laeve*. The villi in the chorion laeve gradually disappear, although they remain in the chorion frondosum, which

is now only that portion of the chorion in contact with the decidua basalis. As the chorionic sac increases in size, it gradually completely fills the uterine lumen. This increase in the diameter of the chorionic sac, occurring mostly during the second month, is largely due to the accumulation of fluid within the amniotic and exocoelomic cavities, and is accompanied by stretching and devascularization of the chorion laeve. The decidua capsularis is also stretched and thinned; it is in apposition to the opposite wall of the uterus, but actual fusion with the decidua vera does not take place until about the middle of pregnancy.

In the eleven day blastocyst, the inner cell mass has developed into an elongated plate of epithelial-like cells, the ectodermal disc. A small clear space is evident between the ectodermal disc and the trophoblast. This is the earliest appearance of the *amniotic sac*. The ectodermal disc forms its floor and the mesoblast the rest of its wall. This mesoblast will constitute the *amnion*, which is a thin, transparent but complex layer. As pregnancy proceeds, the amniotic sac enlarges. When the ectoderm grows downward to enclose the

Figure 1—Blastocyst implanting about the eighth day.

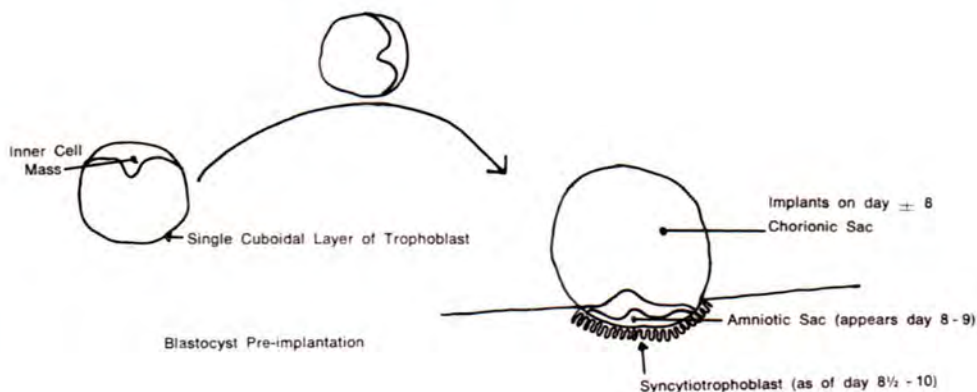


Figure 2—Details of implantation site and embryonic membranes at end of first month.

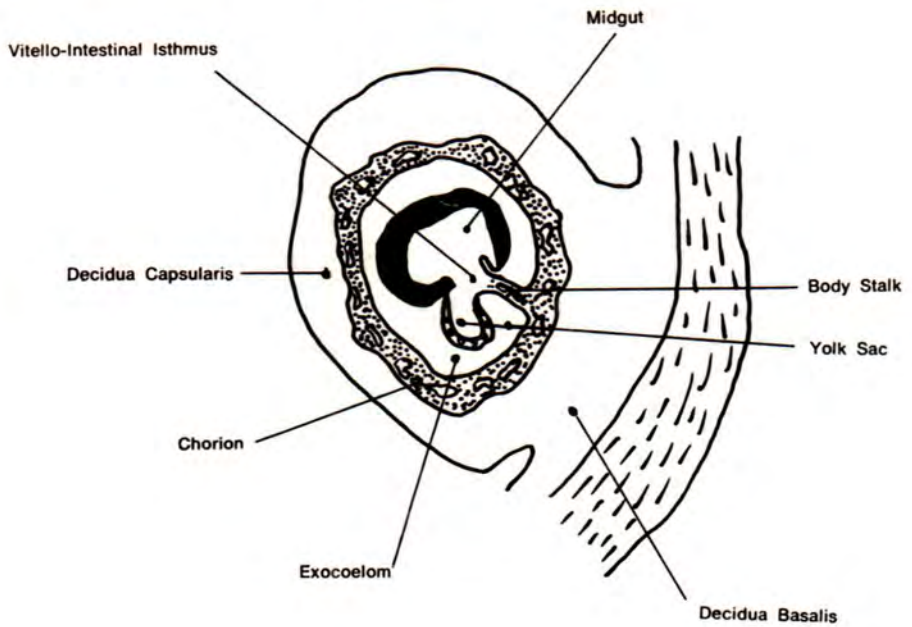
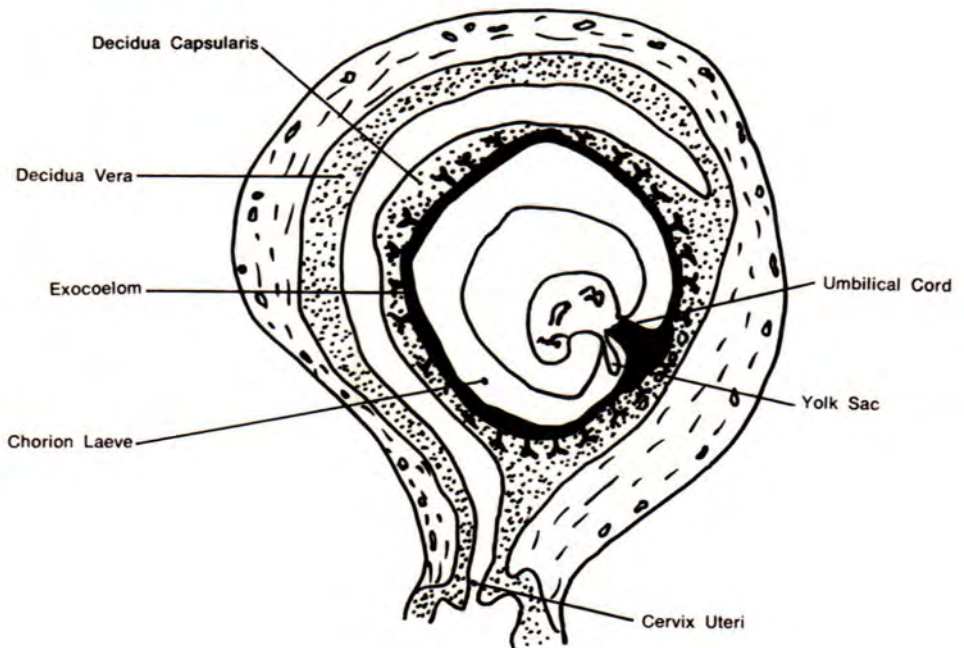


Figure 3—The uterus and embryo with its membranes at the middle of the second month.



embryo and form the epidermis, the amnion too is carried downward because of its attachment to the margins of the ectodermal plate. It forms a sac that surrounds the embryo but is attached to it nowhere but at the umbilicus. By the middle of the third month, the amnion completely fills the exocoelom and is fused with the chorion laeve. The amnion also covers the bulging surface of the placental disc and the lateral surface of the body stalk, which may now be properly termed the *umbilical cord*. The amnion and chorion can be easily separated at the end of the pregnancy.

PHYSIOLOGY OF THE MEMBRANES

The chorion is nourished from the tissues adjacent to it. At least the inner layers of the amnion, and the whole of the amnion forming the partition between diamniotic twins, are nutritionally dependent upon the amniotic fluid. With intrauterine fetal death, the amnion, but not the chorion, slowly degenerates. Apart from the area of the villous placenta, the amnion and chorion have no fetal vessels adjacent to them, and are surrounded by the thinned-out decidua capsularis, and thus by the decidua vera and the uterine wall.

The amnion is lined by a single layer of cuboidal cells which are often flattened over the reflected amnion and chorion in the area of the placental villi. Bourne (1962) and Bourne and Lacy (1960) described an extensive system of intracellular vacuoles, canals, and channels revealed by the electron microscope. It was felt that these lining cells with their microvilli might control communication with the extracellular tissue spaces of the outer layers of amnion and chorion. These cells may thus control the absorption of amniotic fluid. The phagocytes of the connective tissue layers of the amnion and chorion are the Hofbauer cells similar to those of the chorionic villi, but compressed such that they often resemble fibroblasts. These are often only recognizable when containing meconium or other debris.

SPONTANEOUS PREMATURE RUPTURE OF THE FETAL MEMBRANES

GENERAL CONCEPTS

Spontaneous rupture of the fetal membranes often heralds the onset of normal labour, and as such is usually a trivial event. However, when it occurs without the prompt onset of labour, an entirely different group of consequences ensues. The general consensus defines the spontaneous premature rupture of the fetal membranes (referred to hereafter as PRM) as their spontaneous rupture more than one hour before the onset of labour. The *latent period* is that interval between the

actual rupture and the onset of labour. In 80% of cases, the latent period is less than 24 hours. The question of management arises in the remaining 20% who fail to go into spontaneous labour. The latent period seems to correlate with the period of gestation; the further from term, the longer the latent period. Uterine irritability seems to be less before 32 weeks than it is at term. In a few instances labour does not begin until three or four weeks after the PRM.

For completeness, it should be noted that Taylor *et al* arbitrarily set a 12 hour criterion in their definition of PRM due to their observations of minimal perinatal morbidity and mortality until 12 hours had passed.

Little is known about the actual etiology of the accident, and effective modes of management under the various circumstances of its occurrence remain a matter of debate even today.

HISTORICAL ASPECTS

One of the earliest reported studies of the fetal membranes was by J. M. Duncan, in 1866, who carried out a series of tests, by dropping cannon balls onto membranes stretched across a ring.

It is interesting to note the description of PRM in Williams' textbook of 1903. "This accident (PRM) occurs occasionally in primiparae and not infrequently in multiparous women before the onset of uterine contractions, and gives rise to what is designated as 'dry labour', which is usually unduly prolonged and very painful. The delay is due in great part to the absence of the hydrostatic action of the bag of waters, in consequence of which the changes in the cervix must be brought about almost entirely by the direct pressure of the presenting part, which acts as a dilating wedge of imperfect shape and consistency." This complication is usually not so serious in multiparous as in primiparous women since in the former, as a rule, labour sets in within a short time after the discharge of the liquor amnii. Occasionally, however, hours, days, and in rare instances even weeks may elapse before it occurs."

* * *

* This is interesting as a "personal impression" of the author, even though without basis. In fact we do not now believe this, although we have only flimsy evidence of duration of labour after PRM to rely upon. Usually these impressions are repeated from edition to edition, but fortunately not this one.

INCIDENCE

There is no great difference in incidence of PRM in various studies with one exception. For simplicity, seven representative studies will be listed:

1. 8% of all deliveries of which 1.8% had a latent period greater than 24 hours.
2. 6.3% of all deliveries of which 32.6% had premature babies as compared to the hospital premature rate of 13% (Victoria Hospital's is 9%).
3. 7-12% of all deliveries of infants weighing more than 500 grams.
4. 12% of all deliveries and 17% of all premature deliveries.
5. 9% of all deliveries from a hospital population that is described as indigent, non-white, low socioeconomic and educational level, two-third of which were followed throughout pregnancy and one-third of which was first seen late in pregnancy.
6. 4-14% of all pregnancies greater than twenty weeks gestation.
7. 34% of premature deliveries.

From this maze of numbers, one may conclude safely that in any obstetrical setting, about one in every ten patients will have PRM.

ETIOLOGY

The etiology of PRM is still unknown, although many plausible thoughts have been put forward. An inherent weakness of the membranes has been discredited by Danforth in 1953 when he agreed with the 1868 work of Duncan who had concluded that the amnion was the strength-determining layer, but that thickness did not decide bursting tension. The average tension required to rupture the membranes in Danforth's study was 23 to 26 cm. Hg per cm. However, the intrauterine pressure in normal labour rises to 70 mm. Hg (i.e. 17.5 cm. Hg per cm.). It would at first be apparent that intrauterine pressure alone is inadequate to cause PRM. What is actually demonstrated is that Danforth's method of measuring pressure is not applicable *in vivo*.

It has been obvious for many years that PRM occurs more frequently in patients of lower socioeconomic status. Suspecting a dietary factor, Wideman *et al* scrutinized vitamin C supply because of the direct relationship of ascorbic acid to the strength of collagen fibres, hence strength of fetal membranes. In a small series of patients, they found that mothers with normal ascorbic acid levels (0.60 mg.% or more) had an incidence of PRM of about only 1%. With deficient levels, the incidence rose, reaching about 15% in mothers with severe ascorbic acid deficiency (less than 0.20 mg.%). The only

conclusion to be taken from this is that vitamin C deficiency, or a factor associated with it, may be associated with PRM.

Pre-existing maternal infection, especially a latent infection of the urogenital tract, seems to play a role in the etiology of PRM. It is felt that the infection increases uterine contractility. Physical and psychic trauma apparently play a minimal role. Other contributing factors include amnionitis, incomplete cervical os, and polyhydramnios. Speculative factors include placenta previa, pre-eclampsia, and genetically abnormal fetuses.

DIAGNOSIS

It is essential that proof of rupture be established without doubt. The history alone is insufficient, since the patient may mistake increased moisture for amniotic fluid. The problem with all diagnostic tests show us that when there is enough fluid present to make the test positive, one does not require any test. However the tests are interesting and they do distinguish between urine and amniotic fluid.

Rupture of the membranes may be diagnosed by finding fluid of characteristic odour and appearance in the vagina. It may be ruled out by finding fluid in the sac overlying the presenting part. However, at this point one should realize that the site of the membrane leak is significant and must be considered with respect to positive tests. Obvious leakage is frequently co-existent with an intact presenting sac, indicating a supracervical leak.

Several methods revolve around the determination of the pH of the vaginal fluid. Gold in 1927 suggested the use of Lakmus paper, and Temesuary in 1933 proposed using filter paper sticks soaked in 0.2% alcohol-bromothymol blue solution which changes to green in the presence of amniotic fluid. More popular is the use of nitrazin paper, introduced by Baptisti in 1938. Microscopic-cytologic methods have been suggested based on the recognition of lanugo hair or on the recognition of fetal epithelial cells after staining with methylene blue.

A very interesting, simple, and reportedly reliable test is based on an observation by Papanicolaou in 1945 which showed a fernlike pattern of crystallization in dried cervical mucus. Subsequently, this phenomenon was reproduced in almost all the body fluids. The usefulness of crystallization of amniotic fluid for the diagnosis of PRM was first reported in 1955 by Kardos and Tamási who reported a 96.8% diagnostic accuracy. The external genitals are washed down with aseptic green soap solution. Using sterile gloves, two

fingers are introduced into the introitus and gently pressed down on the perineum. A sterile bulb syringe is inserted into the posterior fornix to obtain vaginal secretions. One or two drops of fluid are placed on a clean slide and let dry at room temperature for five to seven minutes. In the presence of amniotic fluid well recognizable arborization of crystals can be seen under the microscope. It is helpful to realize that this procedure is not time dependent. That is to say, even 48 hours after rupture, crystallization is just as clearly evident as in earlier hours. The crystallization phenomenon depends primarily on the relative concentration of electrolytes, proteins, and carbohydrates, the most essential component of which is sodium chloride. Potential problems with the crystallization test include the complicating factors of cervical mucous, blood, and meconium. Crystallization of cervical mucous occurs primarily during the proliferative phase of the menstrual cycle and tends to disappear during the secretory phase, presumably because of the presence of progesterone. The cervical mucous of normal pregnancy does not usually show crystallization. Blood in the vagina may obscure the presence of crystallization and result in a false-negative test. However, this does not occur in every case and repeat vaginal smears should give a more reliable result when significant amounts of blood are present in the vagina. The presence of meconium in the vagina may obscure crystallization but this error is of no clinical significance as the presence of meconium itself is diagnostic of ruptured membranes. Therefore, this test is recommended for use in the office, outpatient clinic, and delivery suite. In the most recent study, the test was positive in 96.25% of cases with ruptured membranes and negative in 96.78% of cases with intact membranes.

COMPLICATIONS

The complications of PRM are basically premature delivery, intrauterine infection, septic shock, and prolapsed cord. The moment the amnion ruptures, the natural safeguard against infection is removed. The danger of infection to both mother and infant increases with each 12 hours that elapse between the rupture and the delivery. The prime effect of all these factors is an increase in perinatal mortality.

Modern figures indicate that PRM increases the frequency of premature delivery (infants less than 2,500 grams) two to threefold. Moreover, these infants die more often (as do those of term size) than infants of comparable maturity for whom membranes remain intact until labour. In the presence of intact

membranes up to labour 1% of all infant deaths are directly related to intrauterine infection. This figure rises to about 20% when PRM has occurred. The main causes of neonatal mortality in patients whose membranes rupture prematurely were atelectasis, hyaline membrane disease, and cerebral hemorrhage. The major cause of fetal death was anoxia due to prolapsed cord, breech delivery, and toxemia.

The most important maternal complication is infection. This may be diagnosed by the presence of ruptured membranes, temperature of 100.4°F, and increased pulse rate, a tender uterus in the absence of uterine contractions and a foul lochia. There is definitely a greater incidence of infection in Negro patients. The time interval, after a 12 hour latent period, is the major factor influencing the development of maternal infection. The presence of infection has more effect on the fetus than on the mother.

Race is an important factor in the incidence of prematurity, but fetal survival in the neonatal period is not influenced by race. The prematurity rate is almost doubled in patients with PRM. The perinatal mortality of the entire group doubled after 24 hours and doubled again during the next 24 hours if patients remained undelivered.

MANAGEMENT

There is no regimen satisfactory to all in the management of premature rupture of the membranes. This discussion might best be started with an outline of the general management of these patients at Victoria Hospital.

1. admit to hospital until delivery.
2. bed rest until dry.
3. speculum examination to assess cervix and to do a high vaginal swab.
4. antibiotics *only* at signs of infection or when labour starts. Ampicillin 500 mgm. p.o. q.6h.
5. if pyrexia is greater than 100.4°F on TWO estimations, then antibiotics and early delivery are absolutely necessary. (can use Ampicillin and Kanamycin until specific growths are identified)
6. Caesarean section is indicated if induction fails or the patient is deteriorating.
7. as an exception, the occasional intelligent patient may be discharged when dry and instructed to take her temperature regularly and to avoid intercourse or douching. She *must* return to hospital at the first sign of vaginal discharge, fever, further fluid leak, or labour.

The early and increasing rise in perinatal mortality with an increasing latent period makes a decision about management mandatory when the patient is first seen. Induction of labour is desirable on the day of admission whenever the child is judged sufficiently large to stand a good chance of extra-uterine survival. Therefore, if pregnancy is less than 37 weeks, it is best to await the spontaneous onset of labour; labour is induced if the patient is at 37 weeks or more of gestation.

It is generally agreed that there is no indication for a vaginal or rectal examination other than sterile speculum examination as already mentioned. Further vaginal examinations are not done until the patient goes into labour, or the physician induces labour.

Antimicrobial therapy during the latent period is unnecessary. In the absence of infection, the antibiotics would be ineffective and may even be contraindicated since the balance of the vaginal flora might be affected. It has been shown that penicillin, streptomycin, chloramphenicol and tetracycline are too toxic, and even overlooking the effect on the teeth, tetracycline would require a priming dose of 750 mg. p.o. to obtain therapeutically effective levels in the fetus. The concentration of penicillin in cord blood reaches about half that in the mothers blood.

Despite the well-known use of vasodilator and alcohol to stop premature labour, these drugs would ordinarily not be used with PRM.

For completeness, the authors must include the following opinions even though it opposes the management already described. These opinions were noted in recent American articles. The medical consensus in these articles is that patients near term whose membranes are ruptured should be induced when the latent period exceeds 12 hours. The true question of management arises in those patients under 36 weeks gestation for whom hope for a slightly larger baby is the stimulus to "watchful waiting". This desire is understandable but felt in these articles to be wishful thinking for the risks incurred by waiting outweigh the possible advantages for either mother or baby. Some infants may gain a few more grams of weight by remaining in utero after the membranes have ruptured, but an equal or greater number will die from infection. A healthy woman can have more babies, and a premature infant free of infection has a better chance of survival than the same baby handicapped by infection.

"Watchful expectancy", "judicious delay", "watchful waiting", "conservative management", whatever deferred action is termed, will result in disaster for some mothers and some babies. Procrastination has no place in the management of premature rupture of the fetal membranes.

As a counterargument, the authors wish to point out that in the context of private patients at Victoria Hospital, with low infection rates, the dangers of waiting have never been demonstrated by a serious maternal infection.

CONCLUSION

There is no unanimity of opinion regarding the management of patients with PRM if labour does not ensue. In addition little is known about the actual etiology of this unfortunate accident. Regardless of what causes it and how it is handled, the problem remains as one of the most challenging situations that the obstetrician encounters.

REFERENCES:

1. Burchell, R. C. Premature spontaneous rupture of the membranes. *American Journal of Obstetrics and Gynecology* 88: 251, 1964.
2. Davies, J. *Human Development Anatomy*. The Ronald Press Company, New York, 1963, pp. 29-33.
3. Duncan, J. M. *Proceedings of the Royal Society of Edinburgh* 6: 163, 1866-1869.
4. Eastman, N. J. and Hellman, L. M. *Williams Obstetrics* (ed. 13). Appleton-Century-Crofts, Inc. New York, 1966, pp. 143-146.
5. *ibid*, pp. 407-408.
6. Greenhill, J. *Obstetrics* (ed. 14) W. B. Saunders Company, Philadelphia and London, 1965, pp. 102.
7. *ibid*, pp. 106.
8. Kovacs, D. Crystallization test for the diagnosis of ruptured membranes. *American Journal of Obstetrics and Gynecology* 83: 1257, 1962.
9. Lanier, Jr., L. R. *et al.* Incidence of maternal and fetal complications associated with rupture of the membranes before the onset of labour. *American Journal of Obstetrics and Gynecology* 93: 398, 1965.
10. MacLachlan, T. B. A method for the investigation of the strength of the fetal membranes. *American Journal of Obstetrics and Gynecology* 91: 305, 1965.
11. Morison, J. E. *Foetal and Neonatal Pathology* (ed. 2). Butterworth's, London, 1963, pp. 55.
12. *ibid*, pp. 74-75.
13. Overstreet, E. W. Consultation on premature rupture of the membranes. *American Journal of Obstetrics and Gynecology* 96:1037, 1966.
14. Potter, E. L. *Pathology of the Fetus and Infant*. Yearbook Medical Publishers, Inc. Chicago, 1961, pp. 6-7.
15. Romney, S. L. Consultation on premature rupture of the membranes. *American Journal of Obstetrics and Gynecology* 96: 1039, 1966.
16. Taylor, E. S. *et al.* Spontaneous premature rupture of the fetal membranes. *American Journal of Obstetrics and Gynecology* 82: 1341, 1961.
17. Webster, A. Management of premature rupture of the fetal membranes. *Obstetrical and Gynecological Survey* 24: 485, 1969.
18. Williams, J. W. *Obstetrics* (ed. 1) D. Appleton and Company, New York, 1903, pp. 563.

Adolescent Medicine

Jock McKeen, '70

Re. J. Roswell Gallagher, in his book *Medical Care of the Adolescent*, prefaced his book with the following statement:

"Adolescents are different, and it is clearly desirable to think about them in different terms than one does of a child or an adult. So, too, is the doctor's relationship to these patients different; no longer is it the parent who tells all the story, and now the patient requires very considerable evidence of his doctor's interest in him. Now to talk to these young people (or better, how to get them to talk to you!), how to deal with them effectively, how to utilize for their own good their tendency to accept advice from and to imitate and to talk freely to other adults than their parents—these we have considered important topics."

Neither an infant nor an adult, an adolescent is somewhere along the developmental pathway between these two groups: consequently, he must be regarded as a member of neither group, but rather as an entity, himself.

Do adolescents represent a significant group worthy of individual medical attention? "Surveys of adolescent health needs indicate that about 40% reach early adulthood with medical or emotional problems that are amenable to medical therapy".² In another study, 45% of the adolescent group have conditions judged improvable by health care.³ A large scale study in New York City involving over 20,000 students indicates that at least 39% have adverse health conditions. This report goes on to emphasize that we must treat the problems that we find; there is no use in establishing morbidity statistics without some intention in mind of improving them.⁴

There is growing interest in treating adolescents medically as a distinct entity. Adolescent clinics are being developed as regular outpatient services in a great number of hospitals to provide continuity of medical care and information concerning the natural history of diseases affecting this age group.⁵ Adolescent medicine is becoming a frequent topic of discussion at medical meetings. There is a growing interest in the evaluation and

management of the disorders common at this time of life.^{7,8}

Although a significant portion of this age group requires medical attention, many do not receive it. This does not imply that adolescents are unconcerned; in fact, a number of studies indicate that adolescents are indeed very concerned about their health.^{9, 10, 11, 12} They are concerned about exercise, nutrition, cigarette smoking, dental hygiene, their physical development, and the maintenance of their general health.⁹

Why, then, does this group not receive the medical attention it requires? Perhaps the low mortality in this age group makes it seem unimportant from the medical standpoint; nevertheless, this is a significant group which is not receiving adequate attention. "The teen-ager shares the universal human need for health advisor, confidante and friend."¹³ The adolescent's physician must have thorough knowledge of the problems and potentials of this group of individuals. There is a vast need and an exciting challenge for physicians in this neglected field.^{13, 14} There is a great need to educate physicians as to the nature of this problem; although there are a number of articles in the literature regarding adolescent medicine,^{15, 16, 17, 18, 19, 20} there is yet a great need to gain rapport with him within the office setting. There is a great need to educate the adolescent as to the advisability of continuing medical care; and, after doing this, we must provide facilities for that care. Family physicians must become adept at diagnosis and treatment of adolescent complaints as well as counselling these developing individuals with their problems. The bewildering changes that the adolescent undergoes as he grows are at best somewhat perplexing, and may be the source of a great deal of anxiety. Physicians should be aware of this fact, should be sympathetic to the adolescent's concern, and should be prepared to teach the adolescent about the normal patterns of development and about his general health care.

In summary, adolescent medicine represents a distinct field of interest. Adolescents are not receiving the health care that they require. Physicians in all pursuits must have a more thorough understanding of this group if we are to ameliorate this situation.

REFERENCES:

1. Gallagher, J. Roswell, *et al.* Medical Care of the Adolescent, Appleton-Century-Crofts, Inc., New York, 1960.
2. Howard, P. Closing the Generation Gap in Health Care. *Postgraduate Medicine*, 45: 195-8, June, 1969.
3. Rogers, K. D. and Reese, G. Health Studies—Presumably Normal High School Students. *American Journal of Disease of Children*, 108: 572-600, 1964.
4. Jacobeiner, H., Rich, H., Beeiberg, N., Merchant, R. How Well are Well Children? *American Journal of Public Health*, 53: 1928-1936, December, 1963.
5. Garell, Dale C. Adolescent Medicine. *American Journal of Disease of Children*, 109: 314, 1965.
6. Gallagher, J. R. A Clinic for Adolescents. *Children*, 1: 165, 1964.
7. Gallagher, J. R., ed. Symposium on Medical Care of the Adolescent. *Medical Clinics of North America*, 1965, Vol. 49, No. 2, W. B. Saunders, Philadelphia and London.
8. Meiks, L. T. and Green, M. (Editors). Symposium on Adolescence. *Pediatric Clinics of North America*, Vol. 7, Nov. 1, W. B. Saunders, Philadelphia and London, 1960.
9. Brunswick, A. F. Health Neds of Adolscents: How the Adolescent Sees Them. *American Journal of Public Health*, 59: 1730-45, Sept. 1969.
10. Deisher, R. W. and Mills, C. A. The Adolescent Looks at his Health and Medical Care. *American Journal of Public Health*, 53: 1928-1936, Dec. 1963.
11. Sklar, H. S. Acute Medical Needs of Adolescents in an Urban Community: a Survey of Emergency Room Visits. *Clinical Pediatrics*, 5: 560-564, 1966.
12. Debuskey, M. The Medical Problems of the Adolescent. *Maryland Medical Journal*, 18: 55-9, January, 1969.
13. Editorial: Appraisal of the Adolescent. *New England Journal of Medicine*, 248: 437, 1953.
14. Editorial: Adolescence. *British Medical Journal*, 1: 748, 1954.
15. Garell, D. C. Approaching the Adolescent Patient. *Med. Arts, Sei.* 22: 19-24, 1968.
16. Glass, S. D. The Adolescent Patient: An Overview. *Maryland Medical Journal*, 18: 48-52, April 1969.
17. Gallagher, J. A., Heald, F. P., Masland, R. P. Recent Contributions to Adolescent Medicine. *New England Journal of Medicine*, 259: 24-31, 74-81, 123-130, July, 1958.
18. Roth, A., Weissman, A., Linden C. A Plan for Medical Care for Adolescents. *Pediatrics*, 18: 86-89, 1956.
19. Gallagher, J. R. The Health Examination of Adolescents. *New England Journal of Medicine*, 229: 315-18, Aug. 1943.
20. Usdin, Gene L. Adolescence Care and Counselling. J. B. Lippincott Co., Philadelphia and Toronto, 1967.

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Book Review

THE CHROMOSOME DISORDERS

An Introduction for Clinicians, 2nd edition.

Dr. G. H. Valentine

William Heinemann Medical Books Ltd. (1969)

172 pages

\$5.25

Dr. Valentine has produced a unique piece of literature. As I have not read the first edition of this fine book, a comparison is not possible. But, then, such a comparison is not necessary, for it need simply be stated that this story is superb! I must call it a story for it is not singly a textbook, a piece of scientific writing, or a review; but it is a story that has incorporated these three descriptions. No variation of the three other descriptions could have been enjoyed as I enjoyed this book. It is a learning experience obtained in a manner typical of Dr. Valentine's lectures. At \$5.25, neither the student nor the graduate can afford to pass up this tribute to Dr. Valentine's mind and wit. For that matter, it would be a steal at double that price. The book is written in simple language, with no technical terms being used unless their meaning has been previously explained. To

quote the cover jacket, this is *not* a book for cytogeneticists.

The book is divided into two parts. The first, "The Grammar of Cytogenetics" is a concise (46 pages), surprisingly interesting presentation of a potentially lethal topic. Part two, the meat of the story, gives a description of the chromosome diseases along with case presentations and excellent photographs.

Although he claims his book to be a work of pillage and piracy, there is not a page without some part of the man himself revealed also. It is really a very personal book, written with a great deal of sincerity of interest and concern. Perhaps more important, and I am sure that such was the intention of the author, with a moderate degree of effort, the book could be read in an evening or two.

To anyone with even a passing interest in the topic, this book is a "sine qua non". Perhaps this review appeared unnecessarily enthusiastic, but I have no doubt that any reader of this story would share and even multiply my excitement.

D.K.P.

* * *

A reveler, weaving his way home after a New Year's Eve party, was crossing a bridge when he suddenly heard a splash, then a cry for help. He looked over the railing and spied a fellow thrashing about in the water.

"Help!" cried the man. "Drop me a line!"

"Sure thing," hiccuped the partygoer.

"What's your address?"

A father and son were posing for a photo immediately after the son's graduation from college.

"Stand a little closer to your father and try to look more natural," the photographer said.

"I think he'd look a little more natural," the father replied, "if he stood with his hand in my pocket."

Memory

Stephen Pearl, '70

INTRODUCTION:

Memory may be defined as the capacity to review or recognize previous experiences. This process is intricately related to learning and so is of great interest to all concerned with scholastic endeavours, as well as a necessary faculty for functioning usefully in society.

Memory is not an isolated capacity unrelated to other faculties, but relies on normal processing of information by our nervous system—such as the following simplified version:

1. Sensory input reception
2. encoding for transmissions (into electrical parameters)
3. association and abstraction
4. storage of information
5. retrieval
6. effector consequences of retrieval
7. Supporting chemical reactions for steps 1-6

Also, affecting the function of the above input-retrieval system are the following parameters: emotional state, alertness, train of thought, external circumstances.

DRUG EFFECTS ON LEARNING AND MEMORY

Recent studies have added some of the above mentioned parameters to 1) attempt to define drug action on memory, 2) by such study understand more of the processes involved in learning and memory. These studies have been restricted to infrahumans for reasons of safety as well as ease of control of experimental conditions. The results of the experiments done must be qualified by the statement that it is very difficult to distinguish drug effect on memory from effect on sensory motivation and performance processes. However, experimentors have concluded that in infrahumans, learning is enhanced by CNS stimulants i.e. strychnine, picrotoxin, pentylenetrazol, amphetamine, nicotine, pemoline.

Drugs given recently after a training experience may impair memory storage. This was demonstrated by use of Actinomycin D to inhibit RNA synthesis, and more definitely by use of acetocycloheximide, which causes an anterograde type of amnesia, possibly by inhibition of protein synthesis.

Some experiments suggest that exclusive of drug use at the time of learning, retrieval of information may be enhanced at some later date by use of drugs: acetylcholinesterase inhibitors facilitate performance. The data of these experiments has revealed that: 1) efficient retention requires an optimal level of acetylcholine, 2) following training there is an increase and later a decrease in the neuro-humor acetylcholine at the synapses involved in learning.

THEORY AND FACTS:

Early research indicated that memory was located in memory traces or engrams or loops, all indicating that memory of specific events was thought to be held in one specific chain of neurones. Some of the early electrical studies of the cortex, during neurosurgery under local anaesthesia, were thought to confirm the loop idea: specific memories were located by stimulation in certain areas of narrow range. However, during the 1950's more extensive studies ruled out the engram theory. After elicitation of a specific memory and then ablation of that area of cortex, the same memory could be elicited elsewhere in the same cortex, or in some cases in the other hemisphere. Substantiating the latter, Meyers and Sperry (1958) demonstrated that simple memories acquired through learning are also transmitted to the untrained hemisphere (via the posterior one-third of the corpus collosum).

Experimentors could only conclude that memory is a diffuse cortical phenomenon. Recently a new model of memory has been suggested to account for this diffuse nature. The word model is used to indicate we are setting up an artificial system to explain events we do not well understand, but which may be subject to testing and give us new information. This is analogous to theories of origin of the universe, where no clear cut evidence gives any one theory credence over others, but new theories suggest new experiments to clarify the process.

This new model is the hologram² theory of memory. A hologram is an interference pattern created when a beam of coherent (laser) light is split so that a "reference" portion of the beam can interact with a portion reflected from a scene or object (see Figure #1). The information is recovered by shining a reference beam of the same frequency onto the recorded hologram. A chessboard example

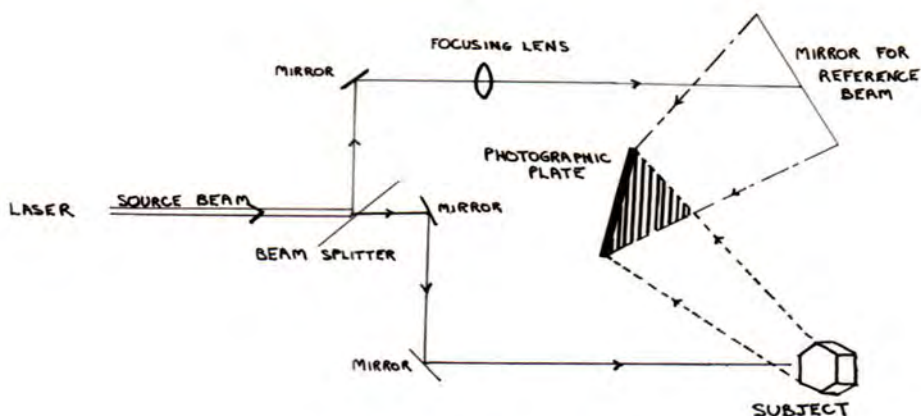


Figure 1: Recording A Hologram

will help to explain some features of the hologram picture: in a two-dimensional picture of a chessboard, taken from one end, a queen may obscure a pawn. In the resulting picture the pawn is not seen and no information about it may be gained. With a hologram one need merely move to the right or left slightly to see the pawn—the image has three-dimensional qualities. This third dimension is added by using the phase information contained in the interference pattern as compared with conventional photography which does not utilize the phase information available. Another quality of holograms is that the information recorded is stored diffusely throughout the whole picture—the recorded image on the photographic plate is simply a pattern of interfering wave front and shows no resemblance to the recorded subject. If the photographic plate should be shattered, the image of the subject could be reconstituted from any of the fragments, although the image

so formed would be smaller than the size of the original in proportion to the size of the fragment.

The proponents of this model of memory conjecture that within the brain, single neurones in a sequential pattern are acted upon by many axons at one time to produce standing wave patterns and wave fronts, giving a hologram effect. The total process may have a more or less lasting effect on protein molecules, and perhaps other macromolecules at the synaptic junctions. The qualities of the hologram which make it suitable as a model of memory are summarized as: 1) many patterns in a storage area can be superimposed and decoded independently, 2) ablation of large areas of storage will not drastically impair function, 3) part of the input pattern will serve as a code (reference beam) for extracting the remainder of the input pattern.

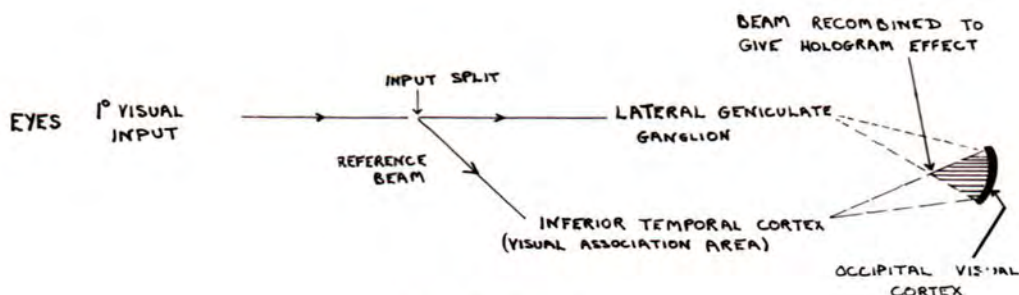


Figure 2: Visual Input

Using the visual system of learning/memory for demonstration, a similar sequence has been proposed. (See fig. 2). This suggests that the signal, that is received by the occipital cortex, is of hologram nature and is interpreted and stored as such in the cortex generally.

CLINICAL FACETS OF MEMORY:

Classification of disease states characterized by amnesic syndrome:

- 1) Amnesic disorders of sudden onset with gradual but incomplete recovery
 - A) bilateral atherosclerotic, thrombotic, or embolic occlusion of posterior cerebral arteries, or their temporal branches
 - B) trauma to diencephalic and/or temporal regions
 - C) spontaneous subarachnoid hemorrhage
 - D) carbon monoxide poisoning, and other hypoxic states (rare)
- 2) Amnesic disorders of sudden onset and transitory duration
 - A) temporal lobe seizures
 - B) post-concussive states
 - C) transient global amnesia
- 3) Amnesic disorders with subacute onset, variable recovery, usually leaving permanent residue
 - A) Wernicke-Korsakoff syndrome
 - B) inclusion-cell (herpes simplex) encephalitis
 - C) T.B. and other types of granulomatous encephalitis
- 4) Slowly progressive amnesic states
 - B) tumours involving floor and walls of third ventricle
 - B) Alzheimer's disease and other degenerative disorders

Transient global amnesia was described by Fisher and Adams (1964). It occurs in middle aged to elderly patients, and is characterized by an episode of confusion and bewilderment

* * *

When I first went into practice, I shared an office with my former chief. Because of his heavy daytime case load, I had to see my own patients at night. The office staff had gone home by then, so I had my own aide, the attractive wife of one of our residents, who'd given up O.R. nursing because of pregnancy and was then in her first trimester. One evening, after we'd disposed of the last patient, she complained of low abdominal discomfort, so I agreed to check her. While she was undressing in the examining room, I grabbed a Coke from the cooler, dropped it, flipped off the cap anyway—and was soaked by the resulting explosion of spray. My aide

which lasts for several hours. It is a basic defect in memory for events of present and recent past with no alteration of consciousness, nor overt signs of seizure activity. This may represent an unusual type of temporal lobe seizure, or be due to transient ischemia.

SUMMARY OF FACTS LEARNED FROM CLINICAL STATES:

- 1) medial portions of diencephalon—especially medial parts of medial dorsal nuclei
- 2) inferomedial portions of temporal lobes—especially hippocampal formations.

SOME AREAS OF CORTEX HAVE SPECIAL FUNCTION:

- 1) Cortex of dominant lobe for word memory
- 2) non-dominant parietal lobe for visual spatial relations.

SUMMARY:

Although knowledge has increased about memory and terminology has changed, Karl Lashley's comment on memory is still pertinent to our present comprehension of this complex process:

"I sometimes feel, in reviewing the evidence on the localization of the memory trace, that the necessary conclusion is that learning just is not possible. Nevertheless, in spite of such evidence against it, learning does sometimes occur."

REFERENCES:

1. Memory—Documenta Geigy, 1969.
2. Neurophysiology of Remembering—Scientific American, 220: 73, January 1969.
3. A Theory of the Nature of Memory—Nature, 211: 1160-3, September 10, 1966.
4. Improved Holographic Model of Temporal Recall—Nature, 217: 1288-9, March 30, 1968.
5. Advances in Holography—Scientific American, 218: 40-58, February 1968.

burst out laughing when she saw me, then insisted on rinsing out my shirt; so I removed it. One look at my undershirt—also soaked, and sporting a large, flapping rent left by the laundry—made her mirth well-nigh uncontrollable. Anyway, that's how we were then my staid old chief, his wife, and some visiting firemen stopped by the office on their way to a formal clambake: me in my soggy tattered underwear; my aide, cap askew on her pretty head, limply hiccupping her way across the room to where she'd hung her uniform.

—Theodore Bawer, M.D.,
in Medical Economics

Letters to the Editor

The editorial staff gratefully acknowledge the encouragement of these unsolicited communications and we shall endeavour to stimulate and entertain to the best of our ability.

H.R.W.

Dear Sir,

Your most recent addition of the Journal has just reached me and I am finding myself reading it with increased interest each issue. I particularly enjoyed Jock McKeen and Cathryn Barbour's discussions of "Drug Use Among London's Youth". If nothing else, they at least have come to understand that these are people who are ill, and that surely is a major discovery. I also find it interesting to read of some of the work being undertaken by the students in their elective periods such as Harry Bergen's report of his time in Thailand.

Might I just comment on your editorial. I found it very thoughtful and your suggestion of doing away with internship altogether seems only logical to me. It may even be necessary to abolish it in order to make the clinical clerkship satisfactory. By establishing straight internship as you mentioned, this does in fact do away with rotating internship. It would seem much more practical for people to go on and train directly in whatever work they wish to undertake.

The only article I would like to take some exception to is the suggestion that has been put forth by others, and has actually been in practice for many years in Kansas, that people after being licensed would spend two years in general practice, and then return to train or continue as Practitioners.

This is obviously a particular area of bias of mine, but I think the day of inflicting on innocent patients, untrained people masquerading as general physicians or family doctors, must soon end. Those of us who've gone through that kind of experience have found it takes many years to acquire reasonable skill and confidence, and in the process the medical care of one's patients is far less than ideal. It also leads to a great deal of dissatisfaction from patients who find that the doctors that they are seeing are unable to deal with the problems that they are facing.

In spite of the difficulties in the early experience in the new family physician training schemes, there can be no doubt in my mind that this is the way for all family doctors to be trained, and if anything, the present courses are now too short.

In any case, I thoroughly enjoyed your editorial and this edition of the Journal.

Best wishes,
Sincerely,
Dr. James A. Collyer
London, Ontario

Dear Sir,

I have just finished reading my latest issue of the Journal and I can't tell you how much enjoyment I have derived from these splendid publications.

The Journal has come a long way forward as a mature, imaginative publication over the past few years. In some measure, a publication of such high quality must reflect the quality of Western's Medical students. The well researched scientific articles and most especially the sensitive editorial comments, indicate a high degree of academic excellence and social concern which portends well for the future of the profession in general and the present day graduating students in particular.

You will find in time that the quality of academic training really means very little in the long run. However, and more importantly, you are discovering much earlier that I did, that an honest concern for people and social problems is the most important quality a physician can cultivate and as a result, as is consistently demonstrated in the Journal, a matureness of thought and attitude come through these pages which make us all extremely proud of our Medical School, and its students.

Yours truly,
John Biehn, M.D.
Sarnia, Ontario

* * *

The basis of clinical medicine is good history taking and the skillful elucidation, assessment and interpretation of physical signs. These skills can be mastered only at the expense of much time and patient—"Not learning but doing is the principal thing" (Pirkey Aboth).

Pappworth M.H. A Primer of Medicine, Butterworths 1963.

Elective Escapades

Pete Nichol '70

Due to the proliferation of the fourth year program, the editors now have an enlarged and esoteric fund of peripatetic medical happenings at home and abroad.

Summer Externship at Scarborough General Hospital

Bob Lang '72

As I walked into the main foyer on my first morning at Scarborough General I was a bit apprehensive about the forthcoming summer. I had no idea what to expect or what my responsibilities were going to entail. Three hours later I was scrubbed in for an inguinal hernia repair, previous apprehension completely forgotten. This was the beginning of what was to be my most rewarding summer to date.

Scarborough General is a 450 bed community hospital located in the east end of Toronto. It serves an area with a very high population density and has one of the busiest emergency departments in Canada.

On the first day, Dr. LaForest, Chairman of Committee for Continuing Education, had the other five externs and myself into his office and explained the externship program to us. We were given free choice of where we would like to work during the summer. We could remain in one area or rotate about as we saw fit. Emphasis was on learning, and we were to help out as much as we could, wherever we were working.

I chose surgery for my first service and spent four weeks scrubbing for many different types of operations—everything from appendectomies to reduction mammoplasties. I was not assigned to any particular surgeon but would go over the following day's surgical schedule and pick the operations that I was interested in seeing.

After surgery, I spent three weeks in the pathology department. The chief pathologist drew up a schedule which brought me in contact with each of the labs, and I attended all autopsies while in that department.

The first autopsy I attended was on a patient who had died from an acute intestinal obstruction (a volvulus). An extensive peritonitis had set in and the whole abdominal cavity was rather a mess. Normally I am not

very squeamish but that day I was very glad that I had skipped lunch, and I could see it was going to be touch and go as far as dinner was concerned.

Following pathology I spent two very interesting weeks with the IV team. After blackening both arms of my instructress I finally began to get the odd one in. During the two weeks I saw a great deal of the hospital as the IV team travels to every corner. I also witnessed several cardiac resuscitations.

The following three weeks were spent on the medical wards. I wanted to learn something about history taking and physical diagnosis in the hope that it would help me with Clinical Science the following year. I saw many interesting cases both in emergency and on the wards. One case I remember in particular was a young 28 year old man who came in with marked ascites, oedema and jaundice. Despite large doses of diuretics, his ascites and oedema steadily got worse and he died in hepatic coma.

His autopsy showed a very diffuse cirrhosis of the liver and marked vascular obstruction. The patient had been born to missionary parents in China. He was allergic to goat's milk, the only food available at the time and as a result suffered from malnutrition. He also probably had hepatitis at a very young age. This all resulted in a liver that was almost completely fibrous tissue and subsequently lead to his death.

My last week in the hospital was spent interviewing patients in Tower 10, the psychiatric unit. Tower 10 is a new concept in psychiatric care. At Scarborough General they treat acute emergencies (i.e. drug abuse, suicide attempts, depression etc.) and specialize in adolescent problems. The ward appears more like a floor in the Statler Hilton. There is broadloom in all the rooms, leather

furniture and stereo equipment. The patients even have a small kitchen where they can make themselves snacks. Crisis meetings are held each day, and admissions from the previous day are interviewed by a panel consisting of a psychiatrist, social worker and psychiatric nurse. Following the interview they discuss the patient's problems, his treatment and long term care. There is a great deal of interdisciplinary exchange in Tower 10 with psychiatrists, psychologists, social workers and specialized nurses all working together.

This brought my summer to an end. As I walked out of Scarborough General Hospital, I felt that I now had a much greater understanding of what lay ahead of me in medical

school and in practice thereafter. Inspiration, awe, and a little bit of fear were all part of this feeling.

Scarborough General Hospital offers excellent programs for summer externships and rotating internships. I would highly recommend it, especially for students thinking of going into general practice. Further information can be obtained from:

Dr. R. A. LaForest,
Chairman, Committee for Continuing
Education,
Scarborough General Hospital,
Scarborough, Ontario

News and Views

Bryson Rogers '71

Dean's Corner

DR. C. G. RAND, of the Department of Community Medicine, recently participated in the 13th annual refresher course of the School of Hygiene of the University of Toronto. He presented a session on "The Problem and Extent of Physical Disability in Canada" as part of a one-day seminar devoted to Rehabilitation and the Community.

DR. DOUGLAS BOCKING, Dean of the Faculty of Medicine, has been elected Chairman of the Board of Governors of Fanshawe College of Applied Arts and Technology. He succeeds Mr. John G. Laurie, Director of Purchasing for 3M Company who had been Chairman since September 1966.

DR. DAVID G. GARDNER, of the Department of Pathology, recently completed the examinations of the American Board of Oral Pathology and is now a Diplomate of the Board, the first Canadian and one of the only three persons outside of the United States who has earned this high distinction. The qualification of Diplomate is the higher of the two sponsored by the American Board of Oral Pathology. The other is the Fellowship which Dr. Gardner has held since 1966. He is also the Director of the U.W.O. Oral Pathology Biopsy Service.

SEVEN HEALTH PROJECTS FINANCED BY ONTARIO DEPARTMENT OF HEALTH

Western was awarded \$40,000 for seven new

projects, by the Ontario Department of Health from a health research grant. In the announcement of the award the Honorable Thomas L. Wells, Minister of Health said that in all \$405,000 was awarded to conduct 28 new health research projects during the current year.

At Western Dr. R. Kimber and Dr. C. Stiller, of the Departments of Medicine and Pathological Chemistry, were awarded \$13,300 for a study of Hereditary Nephritis; Dr. A. Griffin, of the Faculty of Nursing, was awarded \$2,800 for a study of student's Knowledge of Nursing; Dr. W. S. Hunter, of the Department of Paediatric Dentistry, was awarded \$2,500 for a study of dental Spacing-crowding; Dr. R. E. Jordan and Dr. M. Suzuki, of the Department of Restorative Dentistry, were awarded \$2,500 for a study of Remineralization of Dentin; Dr. L. N. Johnson, of the Department of Restorative Dentistry, was awarded \$13,700 for a study of Dental Amalgam; Dr. J. A. Collyer, of the Department of Community Medicine, was awarded \$3,700 for a research analysis of a Family Practice; and Dr. C. G. Rand, of the Department of Community Medicine, was awarded \$1,500 for an evaluation of Diabetic Screening Methods.

Research awards made under the Provincial Health Research Grant since 1967 are in the order of \$2,200,000 increasing from \$200,000 in 1967 to over \$900,000 in 1969.

RECENT CHANGES IN DENTAL, MEDICAL FACULTIES

Recent staff changes in the Faculties of Dentistry and Medicine include:

In the Department of Pharmacology Dr. I. T. Borda has been appointed an Honorary Lecturer in Pharmacology, effective Sept. 1, 1969.

In the Department of Physiology Dr. J. E. Steele has been appointed an Honorary Lecturer in Physiology, effective Jan. 1.

In the Faculty of Medicine in the Department of Community Medicine Dr. C. H. Crowther has been appointed an Instructor in the Subdepartment of Family Medicine, Department of Community Medicine (Victoria Hospital), effective Dec. 1; Mrs. Marcia Fuller, Instructor in the Subdepartment of Family Medicine, Department of Community Medicine (St. Joseph's Hospital), effective Nov. 1; Mrs. Linda Lamb, Instructor in the Subdepartment of Community Medicine (St. Joseph's Hospital), effective Nov. 1; Dr. J. Leake, Instructor in the Subdepartment of Epidemiology and Preventive Medicine Department of Community Medicine, effective Sept. 1; and Mrs. T. O'Neill, Instructor in the Subdepartment of Family Medicine, Department of Community Medicine (St. Joseph's Hospital), effective Nov. 1.

In the Department of Obstetrics and Gynaecology Dr. A. A. Yuzpe has been appointed as Assistant Professor of Obstetrics and Gynaecology (Victoria Hospital), effective Jan. 1.

In the Department of Otolaryngology Dr. R. R. F. Ruby has been appointed an Assistant Professor of Otolaryngology (St. Joseph's Hospital), effective Jan. 1.

In the Department of Paediatrics Dr. Aurora B. Albarracin has been appointed a Clinical Lecturer in Paediatrics (Victoria Hospital), effective Jan. 1; Dr. W. H. Feasby, Honorary

Lecturer in Paediatrics (Victoria Hospital), effective Jan. 1; and Mrs. Halina M. C. Robinson, Instructor in Paediatrics (Victoria Hospital), effective Dec. 1.

In the Department of Physical Medicine and Rehabilitation Mrs. Margaret Trider has been appointed an Assistant Professor in Program of Medical Rehabilitation (Occupational Therapy), effective Feb. 1.

In the Department of Diagnostic Radiology Dr. G. Hamilton has been appointed an Instructor in Diagnostic Radiology (Westminster Hospital), effective Jan. 1; and Dr. L. H. Mullen, Instructor in Diagnostic Radiology (St. Joseph's Hospital), effective Dec. 1.

In the Department of Surgery Dr. G. E. Meads has been appointed a Clinical Lecturer in Surgery (St. Joseph's Hospital), effective Jan. 1; and Dr. R. W. Grainger, Clinical Lecturer in Orthopaedic Surgery (St. Joseph's Hospital), effective Jan. 1.

In the Department of Community Medicine Dr. J. G. Orchard was promoted from Instructor to Clinical Lecturer in the Subdepartment of Family Medicine, Department of Community Medicine (Victoria Hospital), effective Oct. 1.

In the Department of Physical Medicine and Rehabilitation Dr. R. A. Durnin was promoted from Clinical Lecturer to Assistant Professor of Physical Medicine and Rehabilitation (St. Joseph's Hospital), effective Dec. 1.

Dr. W. L. Teskey resigned as Clinical Lecturer in Diagnostic Radiology (Westminster Hospital), effective Dec. 31, in the Department of Diagnostic Radiology.

In the Department of Community Medicine Dr. G. E. Pratt changed rank from Clinical Assistant Professor to Assistant Professor in the Subdepartment of Family Medicine (Victoria Hospital), Department of Community Medicine, effective Feb. 1.

Class News

MEDS '70

One must apologize for aborting our column in the previous issue but apparently only the editor missed it anyway.

Socially the Meds Ball was a highlight of the year with dinner, speakers and dance. Fourth year was moderately well represented at the Ball but Faculty was very poorly represented—a disappointment in view of the occasion and the size of the Faculty. John Evans spoke on behalf of the class and presented Meds '70 as pioneers in various

phases of Medical Education—a well-chosen theme.

Following the Ball by one week was the London Academy-O.M.A. dinner which was a most enjoyable occasion—well-organized and most informative without high pressure salesmanship and we express our thanks to Chairman, Dr. Hirsh Keidan.

From the statistics department; of the males in Meds '70, just over 75% are either engaged or married, whilst 50% of the females are

married or single—whichever way one looks at it.

What must almost be a record for a Medical class has been experienced by Meds '70 with a "triple combo"—first the Spence's, then the Blackshaw's and as of March 7th Elly and Mike, the Kuntz' got into the act. Almost 10% of the class is married to each other.

Engaged and planning marriage in late May or early June are—Jock McKeen and Cathy Barbour, Bruce Lanktree and Jean Stephens, Larry Dunn and Georgette Decaire, Bobby Dzioba and Martha Luciw, Mike Gannon and Dr. Betty Lawrence, Brian Kelly and Nancy Dolan, and George Boutros and Claudine from Alexandria.

Congratulations on swelling the overcrowded ranks to Brian and Diana B'oomfield and Joe and Diane Krepp. After a quick survey, it seems as though group 'A' has the fewest unfilled cavities.

Don Parks. '70

MEDS '71

We are lucky enough to have in our midst the star of the Meds hockey team (unofficially known as "Peachey's Panthers"). Mr. Peachey, in an exclusive interview with the Meds '71 reporter was overcome by pangs of modesty, but under intensive questioning finally admitted that he had "held the team together."

We're also proud to announce that two of our finest, Bruce Bocking and Rich Tieg, placed second in the Health Sciences Bridge Tournament.

The Veenstras are the proud parents of an eleven month old baby boy, whom they adopted in October. From all reports, Jack Junior is living up to his parents' expectations and then some. Congratulations to Jack and Ika from Meds '71.

Four more members of '71 have bitten the dust. Engaged are: Bob Bourne, Rich Finlay, and Graham Swanson. Richard Schulze was married on February 28.

Ruth Nelles, '71

MEDS '72

With the notable exceptions of the Parke-Davis Trip and the Meds Ball early in February, events have been rather quiet this term. More than sixty members of the class indulged in the warm hospitality offered by the hallowed house of chloramphenicol, and with their recently acquired knowledge in the art of prescription writing, they have all vowed to remember dear old P.D. in their prescriptions. Thanks to Ev Bromberg and her ever-ready candid camera, at least some of the festivities will become more than passing memories.

The following are the results of the class elections held on January 15, 1970:

Hon. Class President, Dr. H. J. M. Barnett; President, Rick McLachlan; Vice-President, Ted Quigley; Sec. Treas., Sandi Witherspoon; CAMS, Dixie Esseltine; Athletics, John Rieger; Council of Faculty Rep., Ken Warren; Merry-maker, Bob Miller.

Many members of the class have been awarded summer placements in various departments at the medical school and even more will be spending their time in clinical positions at Victoria and St. Joe's this summer.

Marriage has long been in the offing for several of the class' remaining bachelors, but unless they're being kept secret, there have not been any recent engagements. No doubt the last statement will be out of date by the time this appears in print!

Marilyn Hopp, '72

MEDS '73

The decade was greeted with a general flurry of new leaves being turned over, which lasted about a week when more important commitments rose to the fore. How many devoted young medical students braved the bitter January wind, night after howling night, unbidden, armed only with a Vision and good spirits? Before the Med School still stands (in March) a monument to their toil—a peculiar bifid pyramid of snow.

Roused by the cry of culturally bereft London, six gifted colleagues elected to take the Rail by storm. The Band lurched into the limelight with Ray, Bob and Don providing the music; with them were Angus ("Bad to Hear") MacIver and Tomtom Bell. Conductor Crackower added a schmack of national colour, but the would-be gogo dancer gave out.

Apparently Bev was the life of her birthday party, in case she doesn't remember; whereas Roly almost couldn't get into his.

A glance around the class:

—Spring has sprung, and a few nature-lovers are sprouting facial flora.

—the Arm-men in the Anatomy lab are spreading an ugly rumour that the deadly green spots on their limbs are the handiwork of the Leg-men, and vice versa.

—one wonders what Bruce Devall has up his sleeve.

—those who survived the garbagemouth induced by last term's punch are currently coming down with Long Johnitis, as in Crosby.

For a post-mortem of the pending post-term test Ukrainian Hall bash, see next edition.

Jane Luck, '73

MEDS-AT-HOME

Once again from not so far and not so near the medical society folk congregated for an intimate social gathering which for lack of a better name was called the Meds-at-Home. Things were a little late getting under way due to bad weather, slow hairdressers, good spirits, and free booze in the Hippocratic Council's hospitality room. The banquet got off to a roaring start with the toasting of the Queen. The erudite Mr. Donald R. Gordon conveyed to us by various circumlocutions and the usual panderings of sex that the present state of the world's affairs is akin to

copulation. After this, kudos were handed out to William Clark, John Evans, Henry Rubinstein, David Spence, and Ronald Wexler. Graeme Gair and John Pearson were bilaterally recognized as the only students in fourth year to successfully complete the Master's two-step test. Amid a myriad of pensive and penetrating ruminations by the assembled dignitaries the audience adjourned to frolic further to the rejuvenated Ron Brown, unavoidably admiring Western's most exciting couple, Saulius Kizis and his soon-to-be-announced fiancée. All too soon the cock crowed . . .

The Staph

Sports - The Year of the Jocks

Robert Henderson, '71

Well, the '69-'70 athletic year has drawn to a close. For the first time since 1952-53 Medical Science (formerly called Meds and now encompassing Dentistry, Graduate Studies and Medicine) has won the Interfaculty Athletic Trophy. The participation has been excellent and the spirits high, and the guys have come through as champs in at least eight sports. Those sports especially worthy of note are; (a) track and field, led by Graeme Gair, in which we won seven of eleven events and wiped everybody else off the field, (b) football, which saw Medical Science behind the tremendous leadership of coach Barry Hunter, go through a thrilling season undefeated, (c) hockey, in which the team led by coach Paul Lundy, skated to third place this year, losing only two games all season, (d) water polo, led by Paul Walker, player-coach, which swam to third place in a very tough league, and (e) basketball, headed by Marnix Heersink, in which we also won the championship.

Many thanks to Meds athletic reps, John Pearson '70, Joe Powell '71, Blair Marchuk '72, Marnix Heersink '73, Dwight Moulin '73, and Kent Babcock and Basil Olijnyk (Dentistry), who were of great assistance to me.

MEDICAL SCIENCE CURLING TOURNAMENT

Pete Mitchell did an excellent job organizing a curling tournament for the Labatt's Curling Trophy. Eight four-man rinks took part. In the finals the rink of Greg McGregor, John Reason, Blair Marchuk and Bob Page, skip, beat out Fran Rose, Keith Rose, Sue Mitchell and Pete Mitchell, skip, in a close match. Hopefully this tournament will become an annual event.

MEDICAL SCIENCE BRIDGE TOURNAMENT

Thanks to the good work of Carol Colthart (Meds '72) our second annual bridge tournament was a rousing success with sixteen pairs participating. The winners were Juho Krepp '70, and Tom McKay '70. Second were Bruce Bocking and Rich Tiegs, both Meds '71. Third were Rich Lacy and Bob English, Meds '72 and '73. Many thanks to Mary Jane McKay who directed the tournament, and to Keith Moses (Forest City Bridge Club) who masterminded the setting up of the tournament and supplied boards and cards.

MEDICAL SCIENCE GOLF TOURNAMENT

In the fall of '69 the second annual Medical Science golf tournament was held at East Park Golf Gardens. Rae Munroe (Dents II) walked off with the Molson Trophy for the individual honours and Dentistry also captured the team title. Forty golfers took part altogether.

The following is a list of all the interfaculty sports, including most of our participants and the placing this year.

GOLF—Fourth place: Larry Kerr, Kevin Kosick, Rae Munroe, Paul Wallace.

TRACK AND FIELD—First place: Kent Babcock, Bob Clattenburg—Javelin Champion, Graeme Gair—100 yard and long jump champion, Marnix Heersink, Rick Irvine, Bob Jones, Rich Lacy, Blair Marchuk, Don Russell—Discus Champion, Peter Sheldrick, John Walton—440 yard champion, Paul Willoughby—880 yard Champion.

FOOTBALL—First Place: Barry Hunter—Coach.

Meds '70—Graeme Gair, Joe Krepp, John Pearson.

Meds '71—Pete Sheldrick, Chuck Sun—Q.B., Baxter Willis.

Meds '72—Walt Hartzell, Bob Jones, Hytham Kadrie, Blair Marchuk, John Vallely.

Meds '73—Larry Kerr, Kevin Kosick, Walt Lopacki, Bill Malone, Guido Van Rosendaal, Tony Viidik, Ron Youngash.

Grads—Ed Zusko.

HARRIER—First place: John Foxen, Bob Heyes, John Kelton, Dave Weis (Physiotherapy)—Champion.

BOWLING, 5 Pin—Fourth place: John Campbell, Jim Gatrall, Larry Kerr, Blair Marchuk.

BOWLING, 10 Pin—First place: Ray Anderson, Jim Hicks, Tom Irvine, Larry Piche.

VOLLEYBALL—Sixth place: Nick Buma, John Campbell, Bob Clattenburg, Bob Clement, Dave Elliot, Bob Henderson, Joe Powell, Al Tokarewicz, Jack Veenstra.

TENNIS SINGLES—First place: Ross Cameron, Bob Clement, Rich Finley, Bob Henderson, Jim Hicks.

TENNIS DOUBLES—First place: Barry Clark, Bob Clement, Larry Copeland, Rich Finley, Bob Henderson, Jim Hicks.

HOCKEY—Third place: Bob Beath, Bob Brock, Ed Bruni, Bob Carroll, Jeff Jackson, Sal Kizis, Blair Marchuk, Roy Musgrove, Dave Peachey, Garth Phibbs, Louis Sfredo, Rick Stapleford, Tony Viidik, Paul Wallace, Paul Willoughby—Captain.

WATER POLO—Third place: Tom Bell, Nick Buma, Delf King, Bob Marsden, Bob Miller, Warren Milne, Bud Porter, Al Tokarewicz, Guido Van Rosendaal, Paul Walker—player-coach, Ron Youngash.

TABLE TENNIS SINGLES—First place: Blair Fraser, Delf King—Champion, Chuck Sun, Tony Viidik, Ed Zusko.

TABLE TENNIS DOUBLES—First place: Bruce Bocking, John Campbell, Hytham Kadrie, Delf King—Champion, Chuck Sun, Tony Viidik—Champion.

SQUASH—Second place: John Bowman, Ross Cameron, Scott Geddes, Brock Pullen, John Rieger, Graham Swanson.

PADDLEBALL—Fourth place: John Bowman, Larry Copeland, Rocco Gerace, Peter Gutmanis, Bob Henderson, Walt Lopacki, Bill Malone, John Rieger, Paul Walker, Ron Youngash.

HANDBALL SINGLES—Second place: Bob Clement, Bob Henderson, Blair Marchuk, Bob Miller, Bryson Rogers, Graham Swanson, Al Tokarewicz.

HANDBALL DOUBLES—Second place: Bob Clement, Bob Henderson, Blair Marchuk, Bob Miller, Graham Swanson, Al Tokarewicz.

WRESTLING—Third place: Wayne Everett, Joe Powell, Paul Walker, Dick Whitney—160 lb. Champion, Paul Willoughby, Ron Youngash.

BADMINTON SINGLES—Second place: John Bowman, Bob Clement, Bob Henderson, Ed Lee, Blair Marchuk, John Rieger, Graham Swanson, Paul Zickler.

BADMINTON DOUBLES—Second place: John Bowman, Blair Marchuk, John Rieger, Graham Swanson, John Turner, Paul Zickler.

SWIMMING—Fourth place: Tom Bell, Rich Finley—Butterfly Champion, Dave Flowers, Barry Spooner, Guido Van Rosendaal, Ron Youngash.

BASKETBALL—First place: John Campbell, Doug Connell, Bob Finnie, Paul Hammerich, Jim Hartog, Marnix Heersink—player-coach, Larry Kramer, Walt Lopacki, John McCready, Dwight Moulin, Joe Powell, Dick Tilsworth, Al Tokarewicz, Dave Weis.

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