

# The Lymphatic System, with Special Reference to the Head and Neck

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THERE is probably no anatomical system that has a wider importance in clinical work than has the lymphatic system, and it is curious that in some anatomical courses it receives very little attention. One reason for this is that very few dissecting room specimens yield much information regarding the lymph vessels and glands. Another reason is that the descriptions and names of the various sets of glands differ so much from one anatomist to another and from one clinician to another, that some anatomists question the use of giving anything more than a general knowledge of the subject. The clinical importance of the lymphatic system seems, however, to demand more than this, and in particular to demand that one observer should understand what another is talking about when he refers to any particular set of glands. Our knowledge of the system is continually increasing, and the latest and most up-to-date book on it is that by Prof. Rouvière (1932) of Paris, a work based on very extensive researches by himself and his pupils and on a very wide knowledge of the literature, the bibliography containing 768 references. Some of the facts given by Rouvière are new knowledge, others are corrections of old ideas. The details are so numerous that only specialists in that field can learn more than a small part, and yet the clinical value of much of the information makes it desirable to pick out from it material that can be remembered without great difficulty and shall create a useful working knowledge of the subject. That is the purpose of the present paper, which is based mostly on Rouvière's statements, but partly on those of other writers, e.g. Lake and Marshall (1934), Jamieson (1932), and on the author's own experience. In the first place there is given a general survey of the arrangement of lymph glands and vessels, and secondly the Head and Neck regions are treated in more detail.

## *General Notes on Lymph Vessels and Glands*

Except the placenta, all tissues and organs that receive blood possess lymphatics; organs or tissues that have no blood vessels (epithelium, cartilage, cornea and lens) have no lymph vessels. Lymphatics do not form arborisations like those of blood vessels, but retain the same calibre for long distances. Lymph vessels, except capillaries, possess valves; the number of valves in a given distance decreases as the calibre of the vessel increases. The valves regulate the direction of the current, but blockage by disease causes enlargement of the vessels and lymph may flow in the opposite direction. There is abundant anastomosis between the vessels and therefore blockage must be widespread before it produces much obvious effect (lymphatic oedema). As is well known, carcinoma spreads along lymphatics both by growth of columns



of cells and by embolism. If an embolus of cells or organisms is carried by the lymph stream it is usually in the normal direction of flow, but may be retrograde if the vessels are obstructed.

Except in terminal trunks (thoracic duct, right lymph duct, subclavian and jugular trunks, etc.), lymph goes through glands before entering veins. Work on some animals has shown that this rule may be broken, but Rouvière and his assistants, working on more than two thousand preparations from all parts of the human body, never saw such an occurrence. Glands diminish in size with age, but probably seldom entirely atrophy. There are many very tiny lymph nodules along lymph channels and when, in disease, glands arise apparently *de novo*, it is most probable that they are merely enlargements of pre-existing tiny nodules. Lymph channels can, however, be regenerated (Rouvière).

The deep lymph vessels (i.e. deep to aponeurosis or fascia) mostly accompany vessels, neuro-vascular bundles or, sometimes, nerves. Of the superficial lymphatics (i.e. superficial to deep fascia) only a limited number accompany blood vessels. Rouvière emphasizes the dissimilarity of the course of blood vessels and lymphatics. Scientifically this may be desirable, but it can increase the difficulty of learning the facts. It is generally easiest to learn anything by association with previous knowledge, and the lymphatic system can be most easily learned by reference to what one knows about the blood vessels (or what one can recall by examining specimens or illustrations). When there is contrast between lymph drainage and blood supply, this contrast itself can be used to impress the facts. This method of association and contrast with blood supply has been used in the descriptions that follow. The simplest nomenclature, based largely on position of the glands, has been adopted, and Rouvière's minute subdivisions of gland groups have been avoided.

With reference to the lymphatic drainage routes, numbers and exact position of glands, it is necessary to emphasize the variability from one person to another. This is very important in attempts to use the lymphatic system in accounting for the spread of diseases. It is true, of course, that part of the differences found in different textbooks arises from the technical difficulty of demonstrating human lymphatics. One of the commonest methods of doing so is to inject a fluid containing Prussian Blue, turpentine and ether into cadavera before embalming. The organs and parts are massaged and the fluid spreads along the lymphatics to the glands. Even with the same technique some injections are successful and others are not. In animals dyes can be injected during life, but the argument from other animals to man is often unsafe. Even when all allowance has been made for technique, there remains a considerable actual variation in the lymphatic distribution in different people, and yet there is a great tendency to think of the system as if it conformed to a pattern as closely as does the arterial system or even the nervous system.

The ensuing account, being based on Rouvière's conclusions, can be taken as a summary of the most reliable information on the commonest arrangement of the lymphatic system in the Head and Neck. Being a summary, it can be dogmatic without implying that variation does not exist. Most such variation will be found referred to in Rouvière's book, but even there it would be unwise to place much reliance on the numerical proportions given for the different variations.



The principal headings in this description are glands, but in association with the various groups of glands additional notes are inserted, so as to give, at the most appropriate places, more complete information regarding the lymph drainage from various organs and structures.

#### *Lymph Glands and Vessels of the Head and Neck*

*Occipital Glands*—A few glands are superficial, on or near occipital artery and greater occipital nerve as these pierce the upper end of trapezius. (Adenitis sometimes causes neuralgia or neuritis of occipital nerve.) Before the occipital vessels reach trapezius they lie deep to splenius capitis, and there are always a few glands in that position, which, curiously, have only recently been described, although severe adenitis in that region has been recorded. Afferents to occipital glands: from posterior part of scalp (region supplied by occipital vessels) and upper part of back of neck. Efferents: to glands under cover of sternomastoid, especially those on spinal accessory nerve. Some vessels from occipital region go to these glands directly, instead of to occipital glands.

*Mastoid Glands*—A few on or near insertion of sternomastoid behind ear. Afferents: posterior part of auricle, and parietal region extending much farther up and forward than posterior auricular blood vessels. Efferents: to glands at lower end of parotid or deep to sternomastoid. These two groups also receive directly some of the lymph from the regions named.

*Parotid Lymph Glands*—Some in front of ear superficial to deep fascia covering parotid salivary gland; others deep to the fascia. They may be pushed forward by the growing salivary gland; some are partly buried in it, and others are wholly inside it. Afferents: The region draining into the parotid lymph glands can be associated in a general way with the vessels in or under cover of the parotid gland—the superficial temporal and internal maxillary vessels and the posterior facial vein. There are also some associated regions with a different blood supply, e.g. lacrimal gland. The glands receive lymph from frontal region of scalp and skull, temporal region, upper eyelid and lateral part of lower lid (including conjunctiva) and also lacrimal gland; anterior part of auricle, external meatus, middle ear and even Eustachian tube, *via* middle ear and tympanic membrane; temporal and masseter muscles. (The reader should recall the auricular branches of superficial temporal artery, the deep auricular and anterior tympanic branches of internal maxillary and the transverse facial branch of superficial temporal.) The glands at the lower end of parotid are close to external jugular vein and receive lymph from the regions just named, either directly or by other parotid lymph glands and also from the mastoid glands. Efferents from parotid set: mostly to glands along internal jugular vein; some to glands along external jugular vein.

*Lymphatic Drainage from Ear*—Like auricle, *external meatus* sends lymph to glands on, in and below parotid and to glands deep to sternomastoid, but it is doubtful if it has any direct connection with mastoid glands, as has the auricle. *Tympanic membrane* sends lymph to same glands as external meatus. Concerning the drainage of *middle ear* and *mastoid air cells* very little is known. No connections are yet established between middle ear and mastoid glands, but adenitis of these glands is often found in otitis media. One explanation of this may be the continuity of all lymphatic plexuses from pharyngeal opening of auditory (Eustachian) tube to auricle.



*Auditory tube* sends lymph to retropharyngeal glands (see below) and glands on internal jugular vein. In the *inner ear* endolymph and perilymph take the place of ordinary lymph.

*Submaxillary Lymph Glands*—Associated with external maxillary (anterior facial) artery and anterior facial vein as these are about to cross the mandible; but the row of glands extends forwards and backwards from this point along lower border of mandible. They lie under cover of fascia of submaxillary salivary gland. Afferents: from (1) regions supplied by facial vessels—chin (lateral part), lips, cheeks, external nose, anterior part of nasal fossae (cf. septal branch of superior labial artery), submaxillary salivary gland, medial part of eyelids (chiefly lower) including conjunctiva, ducts of lacrimal gland, canaliculi and naso-lacrimal sac (the lymphatics of which, incidentally, communicate with those of the nasal fossae); (2) parts not supplied by facial vessels—gums and teeth (upper as well as lower), hard palate and soft palate, oral part of tongue, sublingual salivary gland and floor of mouth; (3) submental lymph glands.

The glands at the lower end of parotid are at the posterior end of the submaxillary series, and therefore receive lymph from skin (and sometimes mucosa) of cheek, besides other tributaries mentioned above. There are various small glands along the vessels in the face, but they are somewhat rare, and this accounts for the rarity of adenitis in the face during inflammation, e.g. ulcers of the lips.

*Submental Glands*—At anterior end of submaxillary series, below chin, one to eight in number, subaponeurotic, some often subcutaneous. These glands and those in sublingual region of thigh are the only lymph glands that can be felt when healthy. Afferents: from chin, middle part of lower lip, anterior parts of floor of mouth, of gums and of tongue.

The lymph from submaxillary and submental glands goes to the chain on internal jugular vein. Some of the vessels from the submental glands go there directly, others go to submaxillary glands.

*Lymph Drainage of Lips, Gums, Teeth and Tongue*—*Lips*: Some cutaneous lymphatics cross the mid-line and go to glands of the opposite side. *Gums*: Besides submaxillary and submental glands, the glands on the internal jugular vein receive lymph from the internal (lingual) surfaces of the upper and lower gums, and the retropharyngeal glands (see below) receive lymph from the internal surface of upper gum. *Teeth*: It has been widely held that there are no lymphatics in the pulp of the teeth. Rouvière considers this quite incorrect. The pulp lymphatics are connected with those of the periosteum lining the tooth socket, and these in turn with the lymphatics of the gums, and so the glands that drain the gums drain the corresponding teeth.

*Tongue*: There is a submucous lymph plexus on the dorsum, with scanty communication across the mid-line in the anterior two-thirds, whereas in the posterior third the communication is very free. If the lymphatics followed only the lingual blood vessels, they would pass to glands near the hyoid bone just below the angle of the jaw, but their course is much more extensive. Many pierce the muscular floor of the mouth. The glands that drain the tongue are: (1) glands on internal jugular vein from digastric to omohyoid muscle, draining the whole lateral half of the tongue, the situation of these glands being responsible for the important fact that the first gland involved in carcinoma of the tongue may be low down in the carotid triangle of the neck; (2) submaxillary glands, draining lateral half of oral part of tongue;



(3) submental glands, draining tip of tongue. *Salivary glands* in floor of mouth send lymph to various neighbouring glands. (There are a few small inconstant lymph glands related to genioglossus and hyoglossus muscles below the tongue.)

*Retropharyngeal Glands*—Lateral glands, a right and a left, posterior to the edge of the pharynx at the level of the atlas, medial to internal carotid artery and therefore near to ascending pharyngeal artery; largest in children, much smaller in adults, but seldom entirely absent. The regions drained are: (1) pharynx (buccal and nasal), soft palate and middle ear—corresponding in a general way to regions supplied by arteries of pharynx, the soft palate being embryologically developed from muscles of the pharynx; (2) hard palate (often), nasal fossae and some nasal air cells—not corresponding to blood supply. Efferents from retropharyngeal glands go to glands on internal jugular vein. (There are also some small inconstant median retropharyngeal glands.)

*Lymphatics of Pharynx, Palatine Tonsil and Nose*—*Pharynx*: Some lymph goes to retropharyngeal glands; some directly to glands on internal jugular vein, the higher parts of the pharynx sending vessels to the more superior glands. From *palatine tonsil* the lymphatics go to the subdiaphragmatic glands (part of the chain on the internal jugular vein—see below). *Nose*: From external nose and vestibule the lymphatics accompany facial blood vessels to submaxillary glands. The lymphatic network in the vestibule is, however, directly continuous with the network of the nasal fossae and septum. From the uppermost parts of lateral wall (nasal fossae) and septum, the vessels go directly under cover of pharyngeal mucosa to lateral retropharyngeal glands. The lymph from the other parts of these walls and from floor goes to pretubal plexus in pharynx just anterior to opening of auditory tube. Thence some vessels go to retropharyngeal glands, others to subdiaphragmatic glands. The network in the uppermost (olfactory) region of the nose communicates with the subarachnoid space inside the skull by vessels that run along the olfactory nerve filaments. This has been denied by some observers, but the evidence is quite satisfactory (Rouvière), and the fact is claimed to be of importance in the spread of certain viruses, e.g. that of poliomyelitis. The network of the olfactory region does not communicate directly with that in the respiratory region.

Our knowledge of lymph drainage from *nasal sinuses* and air cells is imperfect. The available evidence indicates that it is the same as that of the nasal fossae.\*

*Deep Glands Related to Larynx and Trachea*—(1) *Anterior Glands*: (a) a constant set in front of trachea (pretracheal), associated with inferior thyroid veins; (b) glands in front of larynx, present in about half the cases; rarely (c) some in front of thyroid gland; and very rarely (d) some in front of thyroid cartilage. These anterior glands receive lymph from thyroid gland (cf. inferior thyroid veins) and also from larynx.

(2) *Lateral Glands*: At side of trachea, along recurrent nerve. A similar set exists also in the thorax. These lateral glands receive lymph from lateral lobes of thyroid gland, part of larynx, trachea and oesophagus, and also most of lymph from pretracheal glands.

On some clinical evidence I am inclined to believe that the maxillary sinus drains partly into the submaxillary lymph glands, just as do the teeth of the upper jaw. Further carefully criticized clinical evidence is desirable—an example of numerous ways in which the clinician could assist the anatomist if the anatomist would state his problems.



Efferents from these glands (both anterior and lateral): The reader should recall that the venous drainage from the thyroid gland goes in two directions—(a) to internal jugular vein by superior and middle thyroid veins, and (b) to left innominate vein in thorax by inferior thyroid veins. In the same way the glands under discussion send lymph both downwards, as far as the glands near the left innominate vein in the superior mediastinum, and also laterally to glands on the internal jugular vein. Some of the glands on the recurrent nerve send lymph also directly to one of the larger lymph trunks in the root of the neck, e.g. the jugular trunk.

The lymph glands in the neck are associated largely with veins; with anterior jugular, with external jugular and, to much the greatest extent, with the internal jugular vein. A note on terminology is desirable here. Confusion can arise by speaking, for example, of the "external jugular chain" of glands, because this term has been used to denote the glands that are lateral (external) to the internal jugular vein. To speak of the "glands on the external jugular vein" is slightly more cumbersome, but avoids ambiguity.

*Glands on Anterior Jugular Vein*—Near the mid-line of the neck, small and few, e.g. one on the vertical part of the vein and one on the lower, transverse part. Besides lymph from neighbouring skin and muscles, these glands sometimes receive lymph from thyroid gland and from larynx.

*Glands on External Jugular Vein*—Usually one or two.

*Glands on Internal Jugular Vein*—Numerous; anterior, lateral, medial and posterior to the vein. Frequently they are grouped into lateral (external) and anterior sets, to some extent independent. These glands on internal jugular vein are carried along the *spinal accessory nerve* from under cover of sternomastoid by way of posterior triangle of neck to deep surface of trapezius. This prolongation deep to trapezius has not been much noted by anatomists or clinicians, and yet these cervical subtrapezoid glands can be the site of acute and chronic adenitis accompanied by torticollis (Huc and Rollet du Coudray, quoted by Rouvière, 1932, p. 54). The spinal accessory chain may in the adult be represented by a simple lymph channel. The glands on the internal jugular vein are also carried along the *transverse cervical artery* in the lower part of the posterior triangle. These two extensions (spinal accessory and transverse cervical), along with the glands on the internal jugular vein itself, are often called the deep lateral glands of the neck.

The regions and structures that send lymph into the chain on the internal jugular vein and its two offshoots are as follows: *To Glands on Internal Jugular Vein*: (1) practically all other lymph glands of head and neck; (2) many regions, e.g. nasal fossae, pharynx, external meatus, tonsils and tongue. There is one noteworthy gland or group situated at the lower border of the posterior belly of the digastric in the angle between the internal jugular and its tributary the lingual vein (or the combined lingual and common facial veins); sometimes called the sub-digastric gland. This gland drains palatine tonsil, pharynx, tongue, teeth and part of nose. It may, when diseased, be very adherent to the veins. (For comparison with blood supply, note that the facial (external maxillary) artery supplies tonsil and that the lingual vessels supply tongue.)

*To Glands on Spinal Accessory Nerve*: (1) occipital, mastoid and supra-scapular glands (the last mentioned *via* the subtrapezoid group); (2) back and side of scalp and neck, also shoulder.



*To Glands on Transverse Cervical Artery:* (1) accessory nerve chain and glands at apex of axilla (very important in carcinoma of breast); (2) anterior lateral part of neck, anterior thoracic wall and sometimes upper limb. It will be noted that the drainage, especially of surface structures, extends over a much wider area than the distribution of the corresponding blood vessels, but as regards the thoracic wall drainage it may be noted that some small arteries from the neck enter the region, as do the supraclavicular nerves. The most medial gland of this set is called by some the "gland of Troisier", because that physician pointed out that it was sometimes invaded in stomach cancer.

The efferents from the glands on the internal jugular vein and the two offshoots proceed as follows:

The chain on the internal jugular vein gives rise in the lower part of the neck to the jugular lymph trunk, which opens, directly or indirectly, into one of the large veins (subclavian, internal jugular or innominate) at or near the angle of union of the veins, further details being given in the last section of this paper. The glands along the spinal accessory nerve transmit lymph to the lateral end of the chain on the transverse cervical artery. The collecting vessels from the transverse cervical chain either end in the lymph trunks, e.g. jugular, thoracic or even subclavian, at the root of the neck, or go directly to one or other of the large veins of the neighbourhood.

It is very important to remember the rich anastomosis between the chain on the internal jugular and its offshoots. The upper glands of the spinal accessory nerve are part of the true internal jugular vein glands, and therefore there seems to be, for example, no point in disputing as to whether the occipital and mastoid glands drain into the one set or the other. The rich anastomosis accounts for the tendency for carcinoma of the tongue to spread widely by lymphatic metastases. The spinal accessory set is connected with the transverse cervical set not only at the lateral end, but also by numerous vessels in the posterior triangle. The lower end of the chain on the internal jugular vein and the adjoining transverse cervical glands are continuous with the chain on the subclavian and axillary vessels (axillary glands), with the internal mammary chain in the thorax and also with the recurrent nerve chain. These connections are important in the spread of mammary carcinoma to the recurrent nerve and into the thorax (see Schwartz, 1934).

*Lymph Drainage of the Larynx, Trachea and Thyroid Gland—Larynx:* In the supraglottic region, i.e. the region above the true vocal cords (including the epiglottis), the submucous lymphatics are very voluminous; in the infraglottic region, i.e. below the true cords, they are less so; while on the free border of the cords the vessels are very scanty and form rather a barrier than a link between the lymphatics above and below. From the cords the lymphatics pass to the supraglottic network, sometimes also to the infraglottic. From the supraglottic region the lymph passes to the glands on the internal jugular vein (cf. the arterial supply—the superior laryngeal branch of the superior thyroid artery). From the infraglottic region the lymph passes to: (1) the recurrent nerve chain of glands (cf. the inferior laryngeal artery which accompanies the recurrent nerve); (2) glands in front of larynx and trachea (this route being comparable to the course of the branches sent to the larynx by the cricothyroid branch of the superior thyroid artery through the cricothyroid membrane, i.e. from in front); (3) glands on internal jugular vein. The question whether the laryngeal lymphatics cross the mid-line and end



in glands of the opposite side of the neck is important. Sometimes they do, but evidence from injection is yet incomplete. Cancerous metastases on the opposite side are uncommon, but glands on both sides should be considered suspect, especially if the tumour is near the mid-line.

*Trachea:* The lymphatics pass: (1) mostly to recurrent nerve chain of glands (cf. inferior laryngeal artery and tracheal branches of inferior thyroid artery); (2) also to pretracheal glands (cf. some of the venous blood that passes from trachea into inferior thyroid veins).

*Oesophagus:* Lymphatics may go to glands near the point on the oesophagus from which they emerge, but they often travel a great distance up or down. Thus some pass through the thyrohyoid membrane to enter glands on the internal jugular vein; others go to lateral tracheal glands, thoracic and abdominal glands.

*Thyroid Gland:* Lymph vessels go to glands on internal jugular vein, to pretracheal glands, including those in thorax, and to lateral tracheal (recurrent nerve) glands. These routes are comparable to blood supply, but in some cases (Rouvière, 1932, p. 123) some lymph goes to retropharyngeal glands.

*Lymphatic Drainage of the Nervous System*—The brain and spinal cord have, so far as is known, no true lymph vessels. The arteries and veins carry a lymphatic sheath between the adventitia (outer coat) and the muscle (middle coat) of their walls. The lymph which bathes the nerve elements can pass by this to the subarachnoid space and so reach the cerebrospinal fluid. Lymphatics of the pia mater have been described, but little is known of them. Those of the dura mater communicate with the subdural space and, by lymph vessels, with the glands outside the skull. There are no glands inside the skull cavity. Sympathetic ganglia have abundant lymphatics.

*Lymph Drainage in the Eye*—The aqueous humour to some extent takes the place of lymph, although the composition of the two fluids is not the same (Wolff, 1933, p. 82 and Samson Wright, 1934, pp. 369-70). The traditional teaching regarding the drainage of the aqueous humour is that it passes into the canal of Schlemm, a venous channel near the corneo-scleral junction, but Rouvière quotes in some detail evidence that shows that the aqueous humour really passes into the lymphatic system along the lymphatic sheaths of the canal of Schlemm and other veins. The lens and cornea have no lymphatics, but obtain their nourishment from the aqueous humour. The sclera and the middle coat (iris, ciliary body and choroid) have no true lymph vessels, but lymphatic spaces, which empty their contents into the space between the choroid and the sclera (perichoroidal space). The lymph spaces of the retina communicate with those of the optic nerve and the lymph passes out partly by lymph sheaths of retinal vessels and partly by a pia mater sheath which takes the lymph into the subarachnoid space.

*Termination of Lymphatic Trunks in the Root of the Neck*—

The common teaching has been that three trunks occurred on each side: jugular, subclavian and bronchomediastinal. Investigations in Rouvière's laboratory by Rodrigues and Pereira have altered these and other prevailing conceptions. The conclusions to be drawn from the work of these investigators are as follows: On each side, right and left, are nine trunks—subclavian (collecting from axillary glands), jugular, transverse cervical, internal mammary, anterior mediastinal, posterior mediastinal, recurrent, lateral tracheal and the



inconstant intercostal (from the first intercostal space). These trunks drain from glands with corresponding names. Almost any of the trunks may be present in duplicate; sometimes the subclavian and jugular are in triplicate.

On the right side a very common mode of termination is by the right lymph duct (*grande veine lymphatique*), which opens into the angle of union of the subclavian and internal jugular veins or into one of these veins, or into the right innominate vein. The duct is commonly formed by the jugular, subclavian, transverse cervical and internal mammary trunks, but all the nine trunks named above may occasionally enter the duct; or all the trunks may open separately into the veins, even into the transverse cervical vein. The duct is only 2 to 5 mm. in length, not so long as is usually stated.

On the left side the thoracic duct enters from the thorax and terminates as does the right lymph duct. The trunks that most commonly enter it are the mediastinal and lateral tracheal. The jugular and transverse cervical do so in about half the cases; the subclavian and internal mammary trunks do so least frequently.

#### REFERENCES

- Jamieson, E. B.—A Companion to Manuals of Practical Anatomy, Edinburgh (1932).  
Lake, N. C. and Marshall, C. J.—Surgical Anatomy and Physiology, London (1934).  
Rouvière, H.—Anatomie des Lymphatiques de l'Homme, Paris (1932).  
Schwartz, H. W.—J. Laryng and Otol., 49, 221 (1934).  
Wolff, E.—The Anatomy of the Eye and Orbit, London (1933).  
Wright, Samson—Applied Physiology, London (1934).

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Radium treatment for cancer, long regarded as too expensive for the patient of ordinary means, soon may become a commonplace method of treating the disease as result of the discovery of Professor Ernest O. Lawrence of the University of California.

After exhaustive experiments with a "deutrom gun", Dr. Lawrence found that ordinary table salt, composed of sodium and chloride, contains radium-like substances of great potential therapeutic value.

The "atom smashing" physicist announced his findings in the Physical Review, a science publication.—*Mail*, Nov. 30.

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#### The Longer Life.

Dr. G. W. Crile, noted surgeon, told an audience the other day, that, with proper attention to health, there is no reason why a man should not extend his active career to the age of 80 or beyond.

Frequent physical examinations, he says, would reveal failing capacities of vital organs and would make it possible for remedial steps to be taken.

All of which, of course, is highly encouraging; but it is just one more instance in which our scientific knowledge seems to have outrun our social sense.

What is the use of enabling a man to keep working to the age of 80, if industry and business decide that the man over 50 is too old for a job!

Unless we revise the idiotic notion that a man's usefulness ends with middle age, there is small use in extending his active life span.



# \*Pulmonary Complications Following Surgical Operations

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DURING a recent review of American and English literature on the subject of pulmonary complications following surgical operations, I was struck by the high percentage of operative cases which developed pathological conditions in the Lungs after the operation. In my limited experience of five years as attending physician to the Victoria General Hospital, I have had the opportunity of investigating some of these complications. Unfortunately we have not collected any accurate figures, but I do believe that the frequency of these cases warrants us to discuss the subject as there are certainly ways and means to prevent these conditions from developing—and also to recognize and to treat them effectively.

Statistical figures are usually tedious to read or to listen to, nevertheless they are facts and I am going to read a few figures which will help to emphasize the statement that pulmonary complications are a too frequent sequella of surgical operations. Lemon estimates that one in every fifty patients operated on may be expected to develop some type of post-operative pulmonary complications, and that one out of every one hundred and eighty-five will die of such a complication. Cutler and Hunt, in a collected series of 18,075 cases, found that two per cent. of patients operated on for any reason, four per cent. of patients in laparotomy cases, and eight per cent. of upper abdominal operations develop such complications. McKesson found 3.03 per cent. of lung complications in 39,438 cases. Gray, of the Mayo Clinic, reports 422 operations on the stomach and duodenum, . . . in 10% post-operative pulmonary conditions developed. Aikenhead of the University of Manitoba reports 33,066 operations with fifty-five respiratory complications. From these figures it is apparent that pulmonary complications following surgical operations are by no means uncommon—and the fact is also brought out that the complications may follow local or spinal anaesthesia, as well as general. Certainly there is a higher percentage of lung complications following operations on the upper abdominal cavity than the lower.

The complications that may follow surgical procedures include: Pneumonia, Bronchitis, Abscess, Gangrene, Infarction, Pleurisy and Atelectasis.

In order to explain the mechanism of these complications various theories have been brought forward which may be grouped.

1. Aspiration theory.
2. Embolic theory.
3. Lymphatic theory.

Certainly, there is no one of these theories which can be accepted fully to explain the mechanism, perhaps there may be a combination of several factors. It does seem most likely that, in the case of Pulmonary Atelectasis there are several factors. The Embolic theory loses ground on anatomical consideration, for it is (difficult) to understand how emboli which are set free from



some abdominal focus can travel through the portal and hepatic circulation without being held up in the liver before reaching the lungs, and certain it is that liver abscess is most infrequent, and practically never seen, following surgical operations. The Lymphatic theory is dismissed without discussion in Pulmonary complications following operations on the upper respiratory tract because the Lymphatic drainage of the neck and mouth is quite independent of the thorax. But this theory has its supporters, especially Higgins and Graham who claim it does play an important part in upper abdominal operations. These workers prove that one of the main routes of lymphatic drainage from the upper abdomen is by way of "efferent lymphatic canals passing through the diaphragm—and that normal muscular contraction of the diaphragm contributed much to the passage of particulate matter through the diaphragm". Operations on the upper abdominal cavity are attended by what might be called a splinting of the diaphragm, which is either mechanical or reflex; mechanical, due to adhesive strapping and bandage, reflex, due to pain and infection. As a result of this splinting, there is brought about a decreased vital capacity of the lungs and stasis of the lymph flow through the diaphragm. So that there follows a primary involvement of the diaphragmatic pleura and extension to the paranchyma of the lung. The aspiration theory is the most widely accepted one. In upper abdominal operations on the stomach and duodenum, there is a necessary handling of the parts, which causes a reflux of the gastric contents. With full inhibition of the cough reflex due to the general anaesthesia, the refluxed material escapes down the trachia into the lungs. Even under a local or spinal anaesthesia this reflux may take place as nausea and vomiting are frequent with these anaesthetics—and the least traction on the stomach may produce these symptoms. The aspiration theory, as may now be understood, does not then actually mean the aspiration of anaesthetic vapors but rather the aspiration of foreign material, blood, pus, stomach content and mucous.

The various complications that are likely to develop in the lungs seem to differ from the ordinary infectious conditions in the lungs.

1. There is no initial chill.
2. Pleural pain is rare.
3. Herpes on the lips are usually absent.
4. The pulse and temperature rise rapidly and assume a maximum in a few hours.
5. Effusions in the pleural cavity are rare.

There are two pulmonary complications which I should like to mention especially, namely Pneumonia and Atelectasis, because these are the two commonest complications which I have seen and which are sometimes most difficult to differentiate between—and because the treatment of the two conditions is different.

Pneumonia may be early, developing within twelve or within forty-eight to seventy-two hours or longer of the operation. It occurs in patients who have taken the anaesthetic poorly, who have had noisy, wheezy, sterterous breathing, who have been poorly relaxed, who have had a recent cold, who have vomited and who have been chilled going to, or in, or leaving the operating room. In the early Pneumonias the temperature rises rapidly to 102-105° there is no chill, rarely pleural pain, cough is at first unproductive, and later is accompanied by purulent sputum, the physical signs are those of a wide



spread Bronchitis or Pneumonitis with scattered Rales over the chest, sometimes scattered patches of Broncho Pneumonia may be defined. The temperature falls by lysis in nine to twelve days. The so-called late pneumonia develops after forty-eight hours. It is usually ushered in with pain in the chest, rarely chill, cough and expectoration; which may be blood tinged, moderate fever  $101^{\circ}$ - $104^{\circ}$  and runs a septic type. The physical signs are those of pneumonia. The prognosis is bad in the aged and in those who are debilitated from previous disease.

The treatment of these pneumonias is along the following lines:—

- (1) Early recognition and careful nursing.
- (2) Abundant oxygen. In surgical wards where the air must be kept at a standard temperature and where other patients must be protected from draughts, it is not possible to give the fresh air treatment, so that the patient is fed oxygen. The method we have been using is by way of the nasal catheter. It is found best to bubble the oxygen through the water bath at 120 bubbles per minute—patients do not seem to object to this method and the loss of oxygen is slight.
- (3) Symptomatic treatment of the cough. We have found particularly in the early pneumonias that the inhalation of medicated steam is especially soothing to the patient. It frequently aids in the expulsion of thick, tenacious sputum from the trachea and bronchial tubes, and in this way lessens the distressing cough and respiratory embarrassment.

Pulmonary Atelectasis is by no means an uncommon complication and in our observations have noted its occurrence as frequently as pneumonia. There are some clinical workers who are of the opinion that pneumonia and Atelectasis are really different stages in the same process. Atelectasis or collapse of the lung tissue has been recognized for nearly eighty years though only since 1925 have frequent clinical reports appeared in the journals about this condition. Quite apart from surgical operations it appears as a complication following injuries to the chest wall, and penetrating wounds of the thorax. It is not to be confused with Pneumothorax, in which condition we have a collapse of the lung resulting from an equalization of the intra pleural and intra pulmonary pressures; whereas in Atelectasis, the lung tissue loses its air and contracts. The term, itself, is to be criticized because it means "failure of expansion"—a condition which is seen in the new born, a more descriptive term has been suggested "Apneumatosi," which means an airless condition of the lungs. I have come across no less than eight theories which have been advanced to explain Pulmonary Atelectasis following operations, some of them very fanciful and most of them inadequate to explain the process. It would seem then more fitting that the pedagogues go on with their research in explaining this phenomenon, and let us as clinicians accept its occurrence and attempt to treat it.

Chevalier Jackson attributes post-operative Atelectasis as being due to a blocking of the bronchi or bronchioles with thick tenacious secretion. Certainly there are sufficient clinical examples to support this theory.

The symptoms and signs depend on the amount of lung tissue involved. In severe cases the attack comes on within 24 hours to 48 hours following the operation. The patient is seized with pain in his chest, dyspnoea, rapid pulse, cough and expectoration—the latter is scanty at first and generally



becomes abundant, purulent and blood streaked, cyanosis is common. The temperature becomes elevated shortly after the attack and rises to  $101^{\circ}$ - $103^{\circ}$ —the leucocyte count increases and may be 20,000. The patient lies on the affected side, with the spine bent, and head towards the affected side—as though to relieve the clutching sensation in his chest. If the area of lung tissue involved be extensive the affected side of the chest appears smaller—and there will be a shift of the heart and mediastinum towards the affected side. The physical signs over the affected side are:—dullness and even flatness on percussion, diminished fremitus and resonance, absence of breath sounds and no rales are heard. It has been called a “dead lung.” In three or four days the physical signs gradually return, the lung becomes aerated again and coarse Rales are heard over the affected area. In the more severe cases a broncho-pneumonia of septic type may develop, lung abscess or gangrene—these cases usually have a fatal termination. On the other hand, with small areas of lung involvement, there may be no pain, dyspnoea or cyanosis, only slight temperature, cough and leucocytosis—the condition being recognized only by careful routine chest examination and X-ray investigation of the lung.

The treatment that we have been following is Posture. The patient is postured on the unaffected side and the foot of the bed is elevated, in an attempt to dislodge the plug which is obstructing the Bronchi. Medicated steam inhalations are also used. Sedatives, like Morphine and Codeine, should be used with caution because they banish the cough reflex and render the respirations shallow, and so prevent the re-inflation of the affected lung. Atrophine in doses of 1/100-1/150 gr. does seem to check abundant secretions. One other point of practical application here is the removal of all restraining bandages and clothing from the patient's chest and allow him as much free inspiration room as possible.

We need say only a few words about Pulmonary Infarction—under which term are included Thrombotic Embolism and Fat Embolism. Just how both these conditions are brought about is not understood the actual treatment is of no avail because they are usually fatal terminations. There are some observers who say that Thrombotic Embolism of the Pulmonary Artery follows a Thrombo phlebitis of the Femoral or Pelvic veins. But post-mortem findings do not always show this condition to be present. The attack comes on suddenly with a feeling of faintness, about one or two weeks after the operation. Frequently the patient has just left her bed for the first time, or has taken a tub bath, or has been straining at stool. There is a feeling of constriction, frequently pain in the chest, intense dyspnoea, cyanosis and collapse—death may be instantaneous or may follow in five to twenty minutes. Head has reported a series of 104 cases of Thrombotic Embolism of the Pulmonary artery following operation—five cases survived the attack.

There is considerable controversy concerning the question of Fat Embolism. There are those who claim it is a frequent complication following operations, especially operations on the Long Bones and in areas where there is considerable deposition of Fat. These observers contend that many of the sudden deaths subscribed to shock, acute Heart Failure, Thrombotic Embolism and Cerebral Haemorrhage following surgical operations are actually due to Fat Emboli which have passed through the right Auricle into the Pulmonary Artery. The attack comes on within the first or second day following the operation—and especially extensive operations where there has been considerable manipulation of the long bones, the symptoms may be cardio-respiratory or cerebral.



There is one point here that may be of practical application, in the choice of anaesthetics. In prolonged operations on the long bones, it is best to limit as far as possible the duration and depth of the fat dissolving anaesthetics, like Ether and Chloroform.

The most important point in the treatment of these pulmonary complications following surgical operations is the prevention, and avoidance of certain things which may predispose a patient towards having any of these distressing conditions developing.

Perhaps the most important step in the prevention is the selection of the patient—of course, this is applicable only in chronic surgical conditions. Recognizing the important role of upper respiratory infections, like the ordinary "cold", Rhinitis, Tonsillitis and dental sepsis, in the production of pulmonary infections, it should be the surgeons' rule never to operate on a chronic surgical condition in the presence of these upper respiratory infections. At least one week should pass by after the subsidence of any symptoms referable to these infections. In surgical emergencies, however, the anaesthetic, if it must be general should be carefully and skillfully given, and where possible, the preference is given to local anaesthesia.

Far be it from any one just practicing that art of medicine to dictate rules and principles to the surgeon in the Operating Room. Nevertheless, there are certain points which should be stressed. The Operating Room must be warm. Bearing in mind that the patient under general anaesthesia has a diffuse vasodilatation of his peripheral vessels, he must be protected by all possible means from any cooling to the surface of the body. The temperature of the operating room should not fall below 78°—it may be uncomfortable to the attendants, but it is safe for the patient.

There is one fact which studies of post-operative Pulmonary complications brings out—and it is that pelvic operations are relatively free of these complications as compared with upper abdominal sections. From this observation the posture of the patient is important. A moderate degree of the Trendelenburg position during the operation, allows better drainage from the Bronchial Tree and lessens the influence of the Aspiration Mechanism. This same position should be used when the patient is returned to his bed and until he recovers from the anaesthetic, at this stage he may be placed in a slight Fowler's position.

As regards upper abdominal operations there are several noteworthy principles. In view of the importance of maintaining as free movements of the bases of the lungs as possible, there should be nothing that would impede such movements. Horizontal strapping with wide adhesive straps across the lower costal margins does hamper respiratory movements and should be substituted for diagonally placed straps. And the time honored tight post-operative binder which stretches from pubes to above the costal margins should be condemned for the same reason. Hyper ventilation of the lungs immediately following the operation by means of CO<sup>2</sup> and O<sup>2</sup> is an excellent procedure, and should be a routine practice. The mixture used is 10% CO<sup>2</sup> and 90% O<sup>2</sup> for two or three minutes. In upper abdominal sections undue handling of the stomach and duodenum is dangerous because of the reflux of gastric secretions. In some clinics a small tube is introduced into the stomach during the operation and left in position there. This prevents reflux of material and any aid in the prevention of dilatation of the stomach.



These few suggestions are put forward and they certainly do deserve consideration—they are by no means original. Certainly any procedure or method of routine that would tend to minimize those distressing and frequently fatal pulmonary conditions that too frequently follow surgical operations deserves careful study and adherence to by our surgical confreres.

- (1) Pulmonary Complications following operations on the stomach or Duodenum—H. K. Gray. Proceedings of the Staff Meetings of the Mayo Clinic, Vol. 8, Feb. 1, 1933, Page 70.
- (2) Post-Operative Pulmonary Complications, American Journal of Surgery, Vol. 13, July, 1931, Page 165.
- (3) Bronchoscopic Observations on Post Pulmonary Complications. Chevalier Jackson Annals of Surgery, Vol. 97, April, 1933, Page 516.
- (4) Five Year Review, Can. Med. As. Journal, 26, 55, Jan., 1932.

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\*Delivered before the annual meeting of the Eastern Counties Medical Society, November, 1934.

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At the last March meeting of the Y's Men's Club of Sydney, Dr. M. J. Macaulay presided, and Dr. H. G. Grant, Dean of Dalhousie Medical School, Halifax was the guest speaker.

Dr. and Mrs. W. H. Eagar of Wolfville, have returned from spending the winter in England, landing at Halifax from the S. S. Duchess of York on March 23rd.

Dr. and Mrs. W. S. Phinney of Yarmouth made a short visit to Boston during the month of March.

Dr. L. R. Morse of Lawrencetown recently spent a few days in Montreal.



# Neuro-Syphilis with Special Reference to General Paralysis

J. L. CHURCHILL, M.D.

AS is true of lues in general, so may it be said of syphilis of the central nervous system. Its manifestations are protean, and in the art of mimicry, for which this disease is so renowned it is never so elusive, never so confusing, as when it attempts its misrepresentations of neurological entities with which it has not a valid right to be associated.

While it is possible to divide neuro syphilis into many more or less clearly recognizable disease entities, it is convenient, and servicable to employ a differentiation that is fairly well defined, and confined to four phases depending upon a pathology that gives rise to a symptomatology that is not so confusing but that a diagnosis may be arrived at and render reasonable the plan of treatment to be adopted.

Depending on the extent to which the pathological lesion is markedly mening-vascular or parenchymatous, the clinical showing predominantly on an inflammatory or degenerative basis, the victim will be found to belong to one of a quartette that may be distinguishable from the triumvirate that own a common and ubiquitous parentage.

To be mentioned first and met within the two first years of infection is a more or less purely meningeal neuro syphilis. It embraces acute syphilitic meningitis, most neuro recurrences and, early asymptomatic disease of the nervous system.

Next in order is a more or less purely vascular neuro-syphilis. This, while it usually manifests itself as a late indication of nervous system insult, may also show its cruel countenance at an early date. It depends on the fact of a localized or wide spread leucic cerebral endarteritis, some times with, but often without, associated meningeal or parenchymatous involvement. It is in this type that one meets with cerebral vascular accidents, hemiplegias, paraplegias. etc.

Belonging as a third member to this underworld group of four is one characterized by diffuse meningo-vascular invasion, with perhaps parenchymatous change as a good measure concession. This relationship includes such scarred veterans of devilry as brain gumma, syphilitic epilepsy, diffuse cerebral neuro spinal syphilis, and late asymptomatic syphilis.

Finally, there raises his fearsome head, the last of the quadruple alliance, in the pathological set up of a more or less purely parenchymatous frame including in its repertory such mal-adjusted variants as tabes and general paresis, with now and again primary optic atrophy as perhaps the only manifestation of the trail of the serpent.

In the three first of these groups the inflammatory element is outstanding, while in the last degenerative changes are the all sufficient and important finding in this form of cerebral syphilis. Accordingly it does not call for comment as to why this latter is the most resistive and unresponsive to treatment of all the forms of cerebral lues to which some who have trodden other than primrose paths fall heir.



Grouping together all persons infected with the leucic organisms whether untreated or treated by the methods in vogue before the arsphenamines supplanted them, about one quarter of these will develop some form of central nervous disease. The time elapsing between primary infection and the appearance of neurologic symptoms is long—12-25 years, and the mass employment of modern methods has prevailed for too brief a period for definitive facts to be gathered on an extensive scale. The type of neuro syphilis will be paretic in about 5% of those infected, tabetic in about the same degree, and 15 per cent. will be found within the memingo vascular circle of misfortune. Neuro syphilis is an even more serious problem than cardio vascular lues; it is probably responsible for as many deaths, and without doubt for much more partial or complete permanent disability.

There is one sad comment to make and it carries with it the condemnation of incomplete attention to duty on the part of the physician, or probably, more frequently, lack of co-operation on the part of the patient, in the sense of the pronouncement that the practitioner will have much less opportunity to display or exercise his neurologic or psychiatric knowledge if he remembers one undoubted and simple fact that, the appearance of symptoms and signs of neuro syphilis is, in most instances, preceded by a period of years dating from shortly after the time of infection, during which period the existence of neuraxis involvement is demonstrable, by means of the procedure of routine lumbar puncture, and examination of the cerebro-spinal fluid. Not only is this true, but it is even possible to predict with a fair degree of accuracy whether the subsequent clinical involvement to be expected (unless prevented by treatment) will be parenchymatous (paresis or tabes) or meningo vascular in type. And finally, mirabile dictu, it is possible in many instances, if not in all, to prevent the development of symptomatic neuro syphilis.

Certain factors in the development of neuro syphilis such as strains of organisms with a predilection for nerve tissue, race, sex, mental strain, etc., need not be more than mentioned. Though important, they are beyond the control of the physician. But there is a factor in respect to management on the part of the latter that cannot be ignored, and that is that inadequate, irregular treatment in early but not in late syphilis the incidence of abnormal spinal fluids is increased and, decreased by prolonged and continuous treatment in both the early and late phases of this amazing disease. The collaboration of experiences of careful and astute observers in this field of medicine furnishes us with the fact that the incidence of early meningeal neuro-syphilis (acute syphilitic meningitis, early vascular accidents) is increased tenfold by inadequate treatment of early leucic infection. Unfortunately, even very prolonged and intensive regimen (excluding fever therapy) does not entirely eliminate abnormal fluids which persist in about five per cent. of all persons infected. In these, usually those with maximal fluid changes the ultimate prognosis is grave, and evidence of clinical neuro syphilis becomes evident. The expected incidence of paresis (5 to 6%) among untreated persons is not materially influenced in either direction by inadequate treatment; and even prolonged, intensive, adequate treatment in early syphilis with the arsphenamines and heavy metals will not eliminate the possibility of paretic or tabetic disaster entirely.

About one to 3% of those infected, no matter how well treated by routine methods, will fall victims to this form of parenchymatous neuro syphilis.

A consideration of certain facts touched upon, and of the data bearing upon asymptomatic neuro syphilis indicates that central involvement is in



part preventable. The hope of recognition of the calamity that is bidding its time before declaring its presence lies in the practice of lumbar puncture in the case of those who are recognized syphilitics. For in this category not less than one quarter will have placed upon them the inexorable hand of vengeance that is finely Italian, but none the less heavy, merciless, and overwhelming. It is generally accepted as true that among untreated syphilitics with a 25% expectancy relative to cerebral involvement this figure may be reduced to 5% or less by means of routine spinal fluid study with intensive treatment for those with abnormal finding in either early or late infection with, in the case of those resistant to accepted modes of treatment, the production of fever by one means or another concerning which I wish to refer before I have entirely abused your patience. Since the outlook for curing clinical neuro syphilis once it has declared itself, or even obtaining complete symptomatic relief, is far from being as good as I have stated relative to one minus obvious evidence of brain involvement, the adage respecting an ounce of prevention carries with it the admonition *verbum sapientibus sat*.

There exists one important factor militating against elimination of cerebral lues more serious than the resistance to treatment of certain patients with recognized asymptomatic neuraxis involvement. This unpleasant feature rests on the fact that in many neuro-syphilitic patients it is not possible to enlist the support of prophylactic treatment because the patient does not know of his infection until neurologic indications become apparent.

It is accepted as a truism that involvement of the nervous system is prone to occur in patients whose early lesions escaped recognition, if they occurred at all. The infected but unrecognized syphilitic is a huge source of supply of some form or other of luetic nervous disease. Should physicians routinely apply the Wasserman test to the blood of patients reporting for any medical complaint, which procedure may be deemed troublesome, if not, in the majority of instances impracticable then in the event of a positive sign being displayed, the call for spinal fluid investigation would be definitely and imperatively vocal.

The form of neuro syphilis that most uniformly kills is G. P. Before the advent of fever therapy this disease was nearly always fatal within about two years from the time of onset of parietic symptoms. Vascular syphilis leads to ultimate death in a high proportion of afflicted persons. In the pre-arsphenamine era it was estimated that 5% of all infected, untreated or treated with mercury would ultimately develop paresis. This has been further clarified by modern knowledge. It is now possible to state with almost unvarying truth that a person with early syphilis whose spinal fluid is normal at the end of the probationary year following intensive adequate treatment, or one with late syphilis (of more than four years duration) whose fluid is normal before, during, or after treatment, will never develop paresis or tabes dorsalis.

The ultimate victims of these two diseases come from the ranks of the patients with early involvement of the neuraxis, symptomatic or asymptomatic. Concerning ourselves for a moment only with the outlook of asymptomatic neuro-syphilis it may be said that much practical information may be derived from a correlation of the type of spinal fluid change with the ultimate outcome.

Statistics are meagre relative to the final outcome of those with minimal fluid changes (cell increase and globulin only). In many cases these changes will regress spontaneously or because of treatment and the patient remains well. In others clinical evidence of syphilis of the meningo vascular type



develops in later years. Until recently little was known of the ultimate fate of patients with early acute meningeal N. S. It is now the belief that the patient's future outlook is as grave as that of asymptomatic neuro-syphilis. With adequate treatment after the development of the lesion 80% may be clinically and serologically cured. With poor, or no treatment, 35% will recover. With adequate treatment 80% of those with meningo-vascular disease will recover, so far as go symptomatic relief and arrest of progress. It is a matter of common experience that the outlook for the results of vascular disease is relatively good, certainly much better than in cerebral vascular accidents from other causes.

Except from sphincter paralysis, the development of cord bladder, and ascending urinary infection, tabes is rarely a cause of death; often though it is the cause of the most gruesome invalidism and incapacity, partial or complete. In perhaps 10% of cases the disease seems spontaneously to burn out after progressing to a certain point after which the victim remains in statu quo for many years.

Already I have exceeded the bounds of propriety in extending my paper to such a length and yet I have only touched here and there so lightly with wide intervals between the scarcely abraded elevations; but ask that I may be permitted a passing reference to that dragon in the menagerie of syphilitic wild beasts, dementia paralytica.

Leaving outside the cage the various neurological and psychiatric manifestations of G. P. it may be pointed out that in most patients with this disease the abnormalities of the spinal fluid are markedly uniform. Moderate cell increase, marked excess of protein, strongly positive Wasserman and so-called first zone colloidal curves. This finding deserves the name paretic formula. Although it almost always occurs in paresis, it is by no means diagnostic of this condition since it occurs in other types of N. S., symptomatic as well as asymptomatic, early as well as late.

It has been stressed by Moore of Johns Hopkins and others, that this type of fluid change, especially if treatment fails to effect improvement, is of serious prognostic import. It indicates definitely that the patient is in danger of developing further neurologic change, which is likely to be tabetic or paralytic in nature. It seems pertinent on this occasion to refer to certain theoretical considerations that have a bearing on any discussion as to treatment of neuro-syphilitic conditions. It was known of old that most foreign substances, e.g. bacteria, drugs, etc., introduced into the blood stream do not penetrate into the central nervous system at all, or only in small degree. In lues, especially, the hematoencephalic barrier does not effectively debar the treponeme from insinuating itself into a region where other more modest organisms fear to tread. And yet, the highly protective tariff wall that nature has erected keeps out the importation of most anti syphilitic drugs. This reason is given by many as that for the lack of desired result in the treatment of N. S. as contrasted with S. of other regions. However, it has been shown by various investigators that the permeability of the barrier is increased in the presence of acute or chronic inflammatory lesions. The whole subject is a complicated one, and certainly so far beyond my ken as to prevent my discussing it.

To Von Jauregg is entitled full credit for the introduction of a new and effective method into syphilotherapy. He and others before him had observed that patients with various psychoses including paresis some times improved after a febrile illness. His first observations were made in 1887. For the next thirty years he tried one method after another of introducing fever into



paretic patients. Deliberate inoculations with erysipelas, with vaccines of various sorts. Finally in 1917 he hit upon a plan of inoculating paretic patients with tertian malaria. In that year nine persons were treated of whom four promptly developed complete remissions; of these, two were still well at the date of last reporting, ten years later. These results prompted the employment of this measure by others with confirmation of the original favourable reports. In the search for other methods of introducing fever, a vast literature has grown up, and one may have some difficulty in arriving at a decision as to which method offers the best chance of producing remissions in the case.

Fortunately for practitioners tabulated results are readily available. And having now encroached upon your time and patience much too far, I shall not ask for more than opportunity to merely cite what appears to me to be evidence that gives malaria the first place at present, at least, in any plan of attack upon G. P.

It is beyond the scope of this paper to enter into a discussion of the various fever producing agents that have, and have had their vogue in the treatment of paresis. Extended observation in a number of different centres throughout the world indicates that the results following upon the introduction of malaria are superior in terms of the incidence of complete remissions and their prolonged maintenance to those from artificially induced fever by other methods. Treatment with diathermy is still in the experimental state, and from all that I could learn by inquiries made in various centres, as late as 2 months, or more ago, this form of treatment is losing rather than gaining ground by comparison with treatment by malaria.

Paresis or tabo paresis is an imperative call for the use of malaria. To postpone its employment while giving a trial to other methods is to invite progressive deterioration and death. With the average patient presenting indications of other types of neuro-syphilis it is considered justifiable if not always the best procedure to employ for at least a year the arsphenamines and heavy metals, then tryparsarnide, before malaria is advised. But without dilating as to reasons, in many cases it may be said, in relation to non-paretic neuro-syphilis, that one may accomplish as much with malaria plus a subsequent 12 to 18 months of chemo-therapeutic treatment as with three years of the latter alone. Moreover the total cost to the patient or the state will be much reduced.

Benign tertian malaria is the infection of choice. It is less trying to the patient, and is quite readily controllable with quinine. Since the infection cannot be carried in laboratories, patient to patient inoculation is the only way at present of starting malarial fever in the general paretic. It is necessary to be sure of the strain because the danger of inoculation with tropical (aestivo autumnal) malaria is very real. Many instances of death have been reported, in whom this type of organism purposely, or accidentally was injected. In white patients who have never previously had malaria (natural or induced) intravenous injection usually induces the disease. Failure occurs in about 7 or 8% of cases. A second inoculation using about 10 c.c. of blood will almost always be successful.

In the Vienna Clinic 5 in 1,000 cases did not react to inoculation.

The average incubation period is three to eight days when the intravenous route is employed. Extremes of 1 to 20 days have been noted. If there is no sign of a take within ten days, adrenalin, intra-muscularly, or 50 to 100 million organisms of typhoid vaccine may start the malarial ball arolling. Or the patient may be reinoculated with fresh infectious blood.



It would be germane to the title, at least, of this paper to describe the malarial course, but there are general comments respecting its relation to paresis that may be informative to some at least. It is stated on good authority that the height and duration of fever have little apparent bearing upon the therapeutic outcome. As a matter of fact excellent results have been reported in patients whose temperature has remained decidedly low.

To the average patient in good condition, 8 to 12 paroxysms are usually permitted. Ordinarily only those paroxysms are counted in which the temperature reaches 103° or over. No attention is paid to the number of chills. High temperatures (to 106° rectal) need not cause alarm; the extreme limit is maintained for only an hour or so. Death from hyperpyrexia is exceedingly rare. The B. P. should be taken twice daily. Both systolic and diastolic pressures always fall, the latter to very low levels, and to a greater extent during the febrile than during the afebrile period. Ignoring the diastolic pressure, when and if the systolic falls below 90 m.m., supportive measures are desirable. If 70 or lower is reached the malaria should promptly be interrupted to prevent possible sudden cardiac failure. Marked tachycardia persisting during afebrile periods (120-140) is a valuable sign, indicative probably of myocardial damage. Other valuable procedures are haemoglobin estimation and observations as to non protein nitrogen retention—this latter about every four to five days particularly if the subject becomes increasingly drowsy. Malaria should be interrupted if the level exceeds 60-80 mgm. per 100 c.c. Though improvement in the mental status may occur actually during the course of fever, it may be delayed for several weeks or months. World-wide experience has demonstrated, however, that if a change for the better does not appear within six months it probably will not occur at all.

The probability of complete remission stands in direct relationship to the duration of parietic symptoms before treatment. The prognosis is better in patients with manic, manic-depressive and expansive psychoses than with the other forms. Next in order are patients with depressive, simple dementia and paranoid psychoses. So-called galloping cases have a forlorn outlook.

The introduction of malaria therapy was followed by its application in psychiatric hospitals throughout the world to parietic patients of all types, early and far advanced, and largely without regard to physical condition.

Even with such unpromising because unselected clinical material as this, and although the death rate from treatment was high, the incidence of complete remissions was very much better than from any previously used forms of therapy. It may be taken as a fair approach to exactness to set forth that in run of mine variety of cases 25% will have complete remissions, 20% incomplete remissions, but able to work, 25% incomplete remissions with permanent hospitalization required (easily cared for). 20% will fail to improve, and 10% will succumb to the protozoon.

It can readily be concluded that malarial treatment for G. P. has decided limitations and is not applicable to every case. But when there is looked upon the prospect of complete remissions for one quarter of all cases, of a return to work of one-fifth even if not in a class with the most favoured, of an arrest of the dread disease at a low level that renders them at least amenable to hospitalization in the case of another one quarter of the total, as against rapid and progressive deterioration to a bestial state with death as the only escape in two years or but little more under older methods of treatment, should not Von Jauregg's discovery entitle him to a lofty niche in the hall of the immortals alongside those who may with truth be acclaimed as the benefactors of mankind.



# Maternal Care\*

E. K. MACLELLAN, M.D.

THE process of child-birth is a natural one. Pregnancy and labor are not associated in our minds with disease. We think of birth as the opposite of death and we do not usually think of the process which results in birth as being associated with death. It is, however, an unfortunate fact that this natural process of child birth far too often results in death.

The average loss of babies at birth per year in Nova Scotia is four hundred and twenty-five (425). There is, in addition, an average annual sacrifice of seventy-five (75) maternal lives due to child birth.

When one thinks in terms of a given community, or in terms of one's own circle of acquaintances, the state of affairs seems to be not at all alarming. In a sense, it is not alarming. The records in our Province are quite as good as the average of the world at large. The comments which are to follow will reflect on the world at large, and it should be understood that the Nova Scotia statistics are quoted because this talk is for Nova Scotian ears.

This loss of four hundred and twenty-five (425) babies and seventy-five (75) mothers per year, will appear rather more striking if one thinks in terms of a period of several years. Let us translate these figures into a twenty-year period from the outbreak of war on Aug. 1st, 1914 to Aug. 1st last year (1934). At the average rate quoted, the loss during this 20-year period would then represent 8,500 babies and 1,500 mothers—a total of 10,000 individuals. Such a numerical loss would be the equivalent of the complete wiping out of the entire population of Counties, such as Antigonish, or Shelburne, or of the three towns of Kentville, Wolfville and Windsor. The people of this Province, during the period of the war, stood aghast at the wholesale loss of life of our young men—yet the total loss of life due to the war represents only about one quarter the loss of life due to child birth in the 20-year period referred to.

We could compile very striking lists of figures to represent the total deaths over a period of twenty years, for such diseases as Cancer, Pneumonia, Tuberculosis, or Heart Disease,—but these conditions are not natural processes.

A process which is natural ought to be one free from much danger. This should be true of child birth. Danger to the life of the mother should be almost non-existent. There are certain dangers to the child which cannot be foreseen or prevented—but it is not an over-statement to say that the annual loss of 425 babies could be reduced to 100, or less, if ideal conditions could be brought about.

Let us consider then in what way the expectant mother and her friend can co-operate to ensure her safety and that of her child. The physician, who is to be entrusted with the care of the case, should be consulted early. His advice and instructions should be followed to the most minute detail. Unusual symptoms should be reported to him at once.

The pregnant woman is far too often surrounded by a group of meddling older and old women, whose delight it is to describe with harrowing

\*One of a series of radio talks given under the auspices of the National Council of Education and arranged by the Faculty of Medicine of Dalhousie University through Station C.H.N.S.



details all the awful things they have ever heard of. This practice should be absolutely forbidden. It inevitably leads to a very undesirable state of nerves, and in some cases, actual terror. The patient should say to such an individual, "My Doctor has forbidden me to discuss my case with anyone but himself, and also, he will not permit me to listen to accounts of other people's troubles, past or present."

It frequently happens that two pregnant women, who have arranged with different physicians, talk over their arrangements, etc. This is very natural and understandable. The companionship is pleasant and there can be no objection to such talks, provided the medical angle is left out of the conversation. There are certain differences of opinion among Doctors, mostly of a minor and unimportant nature. The discovery of a difference of routine will only result in a loss of confidence in one or other patient, with her physician—sometimes both may be left in doubt. Get the man you have confidence in—and talk over your case with him only.

It is not possible or desirable, in a short talk to go into detail in regard to the proper handling of the patient during pregnancy. At the outset the physician will satisfy himself in regard to the past history of the patient and also as to her general state of health. He should give instructions in regard to diet, exercise, rest periods and attention to constipation, if it exists. This is of the greatest importance. He will also explain to the patient, certain symptoms which sometimes arise, and which should be reported to him promptly. He will probably ask the patient to report back to him for a check-up at about four and a half to five months. At this time he may consider it wise to prescribe a tonic with calcium and iron. There is often a degree of anaemia during pregnancy, and also a condition of calcium poverty of the mother's system, due to the withdrawal of this substance from her system to supply the needs of the developing child. From about six and a half months until full term, the patient should see her Doctor at intervals of about two weeks. At each visit the blood pressure is recorded, the urine examined, and certain questions asked which have a very important bearing on her state of health. As a result of these tests and questions, it may be necessary for the physician to make drastic changes in the diet and mode of life. If the instructions given are strictly followed, grave danger will be avoided. To neglect any detail of the advice given may result in loss of life or serious illness. At about four weeks from full term, a careful routine examination should be carried out, in order to determine the position of the child, its relative size, and the pelvic measurements.

In times past, it was not necessary to refer to the use of tobacco during pregnancy. To-day, however, smoking has become so common among women, that it is necessary to advise caution, or better, total abstinence. Recent experimental work has shown that smoking has a very marked effect on the child's heart.

When the time comes for preparation for the confinement, and a decision has to be made in regard to where it is to take place, it should be borne in mind that every patient would be better off in hospital. Adequate facilities to permit the physician to do first-class work, cannot be provided, even in the best appointed private home. It is understood that in many cases financial considerations, distance from a hospital, and other factors make it very difficult to arrange for hospital treatment. In spite of such difficulties, however, it should be arranged that every first confinement should take place in a hospital



and every subsequent case, in which the physician has reason to expect a complicated delivery. If the finances of the patient are such that hospital treatment cannot be provided by her people, it should be provided by the same agencies which furnish hospitalization for serious accidents or illnesses.

It is quite unfair to expect any physician to do good work, unless he has proper facilities and adequate trained nursing assistance. At the present time, many of our country doctors drive great distances, under most adverse weather conditions. They are frequently cut off from communication with other patients for twenty-four hours, or longer, with resulting financial loss. They can only carry very limited equipment. Arrived at the patient's home, the doctor usually finds his only helper is to be some ignorant woman, who means well, but who is more often than not, a source of actual danger to the patient. It may seem to you a strange thing to say, but it is true, nevertheless, that one of the greatest dangers to the patient comes from a combination of an excessively sympathetic mother or husband, and a kindly doctor. After hours of pain, the patient herself and her family, frequently implore the doctor to do something. After repeated insistent demands of this sort, the kindly man, who is tired himself and anxious to get home, sometimes gives in and does something against his better judgment. There must be many thousands of graves in this province, the direct outcome of misplaced kindness and sympathy.

In hospital there are facilities for proper sterilization, which cannot be provided in any home. There is good light—proper delivery tables, instruments and drugs for any complication or emergency. Instead of one untrained nurse, there is ample trained assistance. Blood transfusion can be quickly provided, if it should be necessary. If other doctors are required as consultants, assistants or anaesthetists, they can be got quickly. Measures for resuscitation of the baby are at hand, if necessary. In one of the Halifax hospitals recently, a baby was saved after forty-five minutes without there having been any signs of breathing. Regular breathing in this case was not established for seventy-five minutes after delivery.

The medical profession cannot escape a certain measure of responsibility for poor work that has been done in the past. There is no doubt that in certain instances, bad work has been responsible for loss of life. It must be said, in their defence, however, that they have not been given even a half decent opportunity to do proper work. They are quite capable of doing good work under proper circumstances and they will do this type of work just as soon as the public shows a desire for modern safe obstetrics and will give the necessary co-operation.

Death is not the only disaster which may result from child birth. There are thousands of women who have suffered permanent damage as the result of confinement. Gynaecology or that branch of medicine which has to do with diseases of women, exists very largely as a result of child bearing. Sterility is a common sequel of infection. Permanent kidney damage frequently results. Damage to the child during birth is often followed by Epilepsy in later life, or by mental deficiency. Various forms of paralysis may, also occur. The withered arm of the ex-Kaiser of Germany is due to a birth injury.

In view of the limited hospital accommodation in this province and the great distances from more remote settlements to hospital centres, many cases will have to be attended in their homes in the future as in the past. If such



cases are carefully selected after pre-natal study, they may look forward to the confinement with an easy mind and with every expectation of a safe delivery and a living, healthy child.

As in other branches of preventive medicine, these faults which exist, cannot be abolished quickly. It will take time, and an intelligent co-operation between the patient and her physician. The beneficial results of education of the public in regard to health measures are already very evident in many branches of preventive medicine. It is only recently that any attempt has been made to enlighten the public in regard to the seriousness of the situation in this field. In the last year or two, several popular publications have featured the subject. It may safely be predicted that a marked improvement will take place in the very near future.

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#### Accident Preventers.

Dr. Frederic W. Bancroft, associate professor of clinical surgery at Columbia University, reveals that there is a movement among medical men to foster the establishment of a long chain of medical first-aid stations along much travelled highways for traffic accident victims.

Frequency of such accidents, he points out, makes it necessary to provide some means of giving first-aid treatment to victims. A series of first-aid stations would save many lives and prevent much suffering.

It might also have another good effect. The presence of such a chain of dressing stations might shock the public into realizing how intolerable the traffic accident toll really is.

Properly shocked, the people might some day be stirred into taking action that would make highway traffic safer.—*Mail*, April 2nd.

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#### Widespread Disaster.

From a far-off member of the British Empire comes word of plague and horror.

It is reported that more than 30,000 have died, and at least 1,000,000 (nearly one-sixth of the population) have been afflicted by the ravages of a mysterious "green germ malaria" in Ceylon.

The *Lancet*, British medical weekly, says the seeds of the present epidemic of malaria there were sown eight centuries ago.

Invading Tamils from Southern India drove the Singhalese into the mountains. They returned when the Tamils had departed and found their cities and irrigation systems in the northern and eastern portions of the island in a state of ruin, waste and malaria.

This year's epidemic, it is said, follows the pattern of previous ones.

Workmen are oiling the waters, even to the smallest streams and pools.

"Doctors have been working day and night in laboratories struggling against the germ."—*Mail*.



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and the Secretaries of Local Societies

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## Medical Confederation.

SEVERAL months ago the President and the Secretary of the Canadian Medical Association visited all the provinces and spoke before medical groups in the interest of a scheme for the fusion or the federation of provincial medical societies into the Canadian Association. We had much pleasure in hearing them in Halifax, and though we fear that they mistook warmth of hospitality for complete acquiescence in their scheme, yet there was no doubt as to the feeling that the idea as presented by them had much to recommend it.

No thoughtful medical man does other than accord high value to medical organization. That inestimable benefits may accrue from each of its divisions local, provincial and federal, nobody doubts or denies. Yet there were few here, we are sure, who had at all appreciated the very valuable part which the Canadian Medical Association is playing in national affairs, a part which affects us as a profession and as individuals.

If then, it is agreed, that medical organization as we have it, is of value it must follow as a corollary, that anything we can do to strengthen such organization enhances its value, and if the Canadian Medical Association can speak to excellent purpose now, when it represents the proportion of our people that it does, with how much more certain a voice could it speak if the representation were a hundred per cent! We believe that the trend of the times is in such a direction as to demand that we give serious thought at least to any effort which is directed towards that end.

The principle and the aim being stated, it remains to consider the details of its consummation. Here we begin to run into difficulties. The first is something, older than the C. M. A., out of which, when another confederation is suggested, there tends to arise the reaction, *timeo Danaos et dona ferentes*. That is something, however, which in medical affairs, knowledge and our innate good sense will overcome. The second arises out of the realization that if value is to be conveyed there must be consideration. In other words, we should expect to pay for what we get. But the question is, what is to be the price? On this point, so far, the promoters of the scheme have been sphinx-like, though we have seen one plan which we are here unable to discuss because we have no knowledge that it has official sanction. Our latest word is that



the whole matter is soon to be discussed by Council of C. M. A., that nothing is to be released before that meeting, and that their suggestions will be in our hands *in time for our annual meeting*. It is understood that the President and the Secretary will be with us at Sydney, and they will inform us fully about it. We cannot but feel, however, that it would be infinitely better if we were given the scheme to consider well beforehand, for our decision might then be registered as a result of mature thought.

Believing that this question of medical confederation is one of great moment for our profession, we commend it to our readers for most serious attention. It is the most important matter that will be presented to us at Sydney this summer, and probably the most vital that has come before our Society in many years. Meanwhile, we would welcome contributions to the subject which any may care to make to our pages.

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Out of the greater question of a more powerful medical organization arises another which, it appears to us, will have to be faced and answered: How long are we going to retain the present system of voluntary membership? Every medical man benefits by what medical organization has accomplished. That means that those who do nothing for its support share in all its benefits at the expense of those conscientious supporters who have borne the burden and heat of the day. That this is grossly unfair is too patent to require amplification, and is enough to call for some action. But there is more. We have suggested that the strengthening of medical organization is desirable and that it is reasonable that it should cost us something. Yet there is a definite feeling abroad that already it is costing too much. How are these things to be reconciled? By compulsory registration—as is working out so well in other provinces—and at reduced rate? Or is there a better way?

We visualize a solid Canadian profession, speaking with one voice in national affairs. We cannot but feel, however, that an essential step towards that end is the unification of provincial personnel. That seems desirable on all counts, not the least of which is that four hundred members at five or six dollars would be infinitely better for this province than two hundred or so at ten.

This has been a subject for debate among many of our members during recent months. We would commend it for still further mental exercise, primarily as affecting our local organization, but not the less in terms of the broader national outlook.

N. H. G.

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### Typhoid Carriers Harmless by X-Ray.

Typhoid carriers can be rendered harmless by X-ray treatments, it was announced to-day after experiments at the University of Illinois college of medicine.

This new attack on the problem of typhoid carriers—blamed for the bulk of this state's 1,200 cases per year—came from Dr. Lars Gulbrandsen, instructor in bacteriology. He found X-ray applications to the liver and gall bladder of persons who carry typhoid germs will destroy the germs in two months or less.—*Mail*, April 2nd.



## CASE REPORTS

### ANGINA PECTORIS AND CORONARY OCCLUSION.

*Patient:* Male, age 62 yrs. Occupation: Dean of the faculty of Arts and Science of a leading American University.

*Previous History:* Health good with the exception of repeated attacks of Angina Pectoris, which were of short duration.

*History of present illness:* Patient was enjoying a vacation at a local hotel and after luncheon, about 2 p.m., had a swim, then accompanied his friends to the golf links and played a few rounds of golf. While playing golf he experienced an attack of Angina Pectoris and returned to the hotel. This soon subsided. That evening he ate, indiscretly, a considerable quantity of lobster and clam chowder. Later on, I learned that this was supplemented with a few whiskies and soda which was the first time he had imbibed for over one year.

About 9 p.m. he, as he thought, had another attack of Angina Pectoris and I was called to see him. He informed me that the present attack appeared to be different to the previous attacks. He seemed to be alarmed.

*Examination:* Heart slightly enlarged; sounds were of the tic-tac nature and I was unable to distinguish any murmurs. Pulse rate: 155. There was advanced arteriosclerosis. I did not do a blood count. Temperature normal.

*Lungs:* Examination did not reveal any pathology except for a few fine basal rales.

*Respirations:* 25. The breathing was deep and labored.

*Abdomen:* Slight rigidity in the epigastric region with some distention. Bowels had not moved for 36 hrs. There was no history of abdominal disturbances except during the attacks of Angina Pectoris.

*Nervous System:* Normal. There were no convulsions. Temperature: Normal. Urine: Normal.

*Skin:* Clear except for a few petechiae over the chest and abdomen. The body was bathed with cold sweat. Mentality: Patient was active and restless, but the mentality was normal.

*Blood Pressure:* S. 138; D. 80. He questioned me re the B. P. and I felt obliged to give him information, as I realized he knew something about it. I was then informed that his Systolic pressure during the last few years was in the vicinity of 175 to 180, but always dropped about 30 to 35 points during the so-called attacks of Angina. He remarked: "Do not worry about the B. P. dropping; it will go up again as soon as the attack is over."

*Symptoms:* The marked symptoms were: deep and labored breathing (characteristic of the Cheyne-Stokes breathing, but not typical;) nausea and vomiting. He vomited approximately every ten minutes for 30 hrs. He was active and restless and passed urine frequently, but in small quantities. He talked incessantly.



*Treatment:* I diagnosed the case as one of *Coronary Thrombosis or Occlusion*. Morphine gr.  $\frac{1}{4}$  was given q.4. h.; Digitalin, Gr. 1/100 q. 3. h. Ice and Cocaine were given in sips for the nausea and vomiting without results.

About 1 hr. after giving the first dose of Morphine, he was given a S.S. enema with good results, expelling much flatus. At 5 p.m. the following day, the pulse rate dropped to normal and the Digitalin was discontinued. At 10 p.m. the pulse suddenly increased to 155 and a dose of Digitalin was given. At 3 p.m. the pulse became slow and weak and within the space of a few minutes the patient expired.

*Differential Diagnosis:* Apparently Coronary Occlusion and Angina Pectoris have similar symptoms. *Should they be separate clinical entities*, they present a difficult problem for diagnosis. In this case the patient experienced a sense of constriction across the chest, accompanied by a moderate amount of pain, during the previous attacks. The attacks were of short duration over a period of several years. His physician was treating him for Angina Pectoris and warned him against strenuous exertion. He generally became nauseated during the attacks, but according to his conversation, did not consider the condition seriously.

During the last attack he had the feeling of suffocation and no precordial pain. He realized that there was a change in his condition and had a sensation of impending death. About 4 hrs. before he expired he asked the nurse for a pencil and paper. The request was granted and he wrote a poem from which I will quote one verse:

"When the daylight comes to-morrow  
With its rosy-fingered dawn,  
I'll be sailing on the ocean,  
Listening to old Triton's horn."

Apparently it is easy for us to confuse Coronary Occlusion with Angina Pectoris and acute abdominal diseases. In Angina Pectoris the patient has a tendency to remain quiet and struggle for breath. In Coronary Occlusion he is frequently active, restless and talks incessantly. Dr. Howard Sprague states that one of the most characteristic signs of Coronary Occlusion is the sudden fall of B. P. This usually takes place within a few minutes or hours of the onset. He also states that in cases of hypertension the marked fall of the systolic level is almost diagnostic of the disease. In the above case, as previously mentioned, the patient stated that there was always a sudden fall and rise in the B. P. at the beginning and end of the attacks.

*Conclusion:* I am wondering if this patient did not have repeated attack of Coronary occlusion. Small particles of the vegetations which sometimes grow on the surface of the valves of the heart may break loose and, after entering the blood stream, occlude a coronary arteriole or an arteriole in another part of the body. The petechiae on the chest and abdomen of this patient supports the theory. It is reasonable to suppose that an embolus in the region of a cardiac nerve would cause pain due to, 1, Congestion causing pressure; 2, Infarction. An embolus in the region of the Bundle of Hiss would, naturally, be more serious.

I regret very much that I was unable to perform a post mortem in this case as a macroscopical and microscopical examination of the heart structures might have revealed valuable information.

D. S. SUTHERLAND, M.D.,  
Chester, N. S.



## Preventive Medicine, Periodic Examination, and Protection of Mothers Against Cancer

JOSEPH COLT BLOODGOOD, Baltimore, Md.

I HAVE now before me my article which has just appeared in the March, 1935 number of the NOVA SCOTIA MEDICAL BULLETIN. Its title is "What Every Doctor, Both General and Specialist, Should Know About Diseases of the Female Breast." I wish to emphasize both to the medical profession and the public that every woman will be warned in time by feeling something definite in the breast or seeing a discharge from the nipple or having a new sensation in the breast. The difficulty is not with the warning. The difficulty is to get women to heed the warning in time, and every woman should know that when she receives the warning from the breast she should not wait longer than two weeks before she presents herself to a doctor for examination. And even if the warning disappears, she should not fail to get the examination at once. Many women seek the examination by their doctors after being warned by some sensation in the breast. But the number of women who answer within two weeks is still too small, and many of these women who delay suffer from it.

What the general practitioner and all members of the medical profession must realize is that it is their responsibility to persuade these women who are warned in time to act in time.

Another very important point for every member of the medical profession to realize is that if any doubtful tumor is felt in the breast, the safest thing to do first is to give the breast a definite thorough course of irradiation by K. V. 200 X-ray machine. While the breast is being properly irradiated, there is no danger in delaying an operation if it should be needed. There is absolutely no reason why every woman warned in time should not be examined properly in time by her physician and decision immediately made whether the breast should be irradiated.

I have been writing for the public on cancer since 1913 and have studied most carefully the things that have attracted the attention of the writers for the public press and the readers of the daily press. For example the statement—"No beautiful woman suffers from cancer of the skin, because she pays immediate attention to any skin blemish" was hit upon by me many years ago. It always attracts the attention of the keen newspaper reporter and by now has been published frequently throughout the world. It will ultimately probably do more than any other phrase to make cancer of the skin a preventable disease. Later, I found that I could make this statement—"The modern woman is teaching men how to smoke with the least risk of cancer of the mouth, because she keeps her teeth clean and smooth and seeks the examination by a dentist or a physician the moment she experiences a sore spot in the mouth." In a recent address delivered to dentists I told them that:—"cancer of the oral cavity is a preventable disease and rheumatism due to the neglect of teeth is also a preventable disease, and that the dentists of this country and of the world, by performing their chief function could so educate the public that cancer of the oral cavity and rheumatism due to the neglect of the teeth could be eliminated from the diseases of the mouth."

This attempt of mine is to present in definite statements the facts to people in such a way that it would lead to prevention of cancer or to its earliest recog-



dition and proper treatment. In this presentation in the NOVA SCOTIA MEDICAL BULLETIN for April, 1935, I cover the entire ground except cancer of the cervix in mothers. This is such an important problem that it will be dealt with specially in the May BULLETIN, and I hope to have discovered by then a new slogan which will be more helpful than what we have at present to make cancer of the cervix in mothers a preventable disease.

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This is part of an address given by Dr. Bloodgood in Paris, April 26, 1932, before the French League Against Cancer, before the American Legion, before the medical students in Professor Roussy's Clinic, and before the Society of Dentists.

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### Protection From Cancer of the Skin, Vanity, Information, Cleanliness.

**N**O beautiful woman suffers from cancer of the skin, because she pays immediate attention to any skin blemish. Recently, with others, she has learned the danger of the irritation of the skin over the bridge of the nose because of never-slip eye glasses. During every physical examination the physician should examine the skin for pigmented moles, warts and every other type of skin lesion. Mothers, nurses, and obstetricians, should look over the new-born infant for birth-marks and other skin blemishes that need immediate treatment. School teachers, athletic directors and swimming teachers should call to the attention of their scholars the presence of any skin defect. The knowledge of the protection of the skin can easily be taught in the primary schools. Cancer never begins in a healthy skin—there is always a spot in the skin which is abnormal, easily seen or felt, and which at first is not cancer and can always be cured before cancer develops. If there is any scaly roughness, discharge or bleeding of an area of the skin or a previously existing skin blemish, it should be treated like a wound of the skin—wash it with warm water and soap, using cotton; rinse it off with medicated alcohol; cover it with a little vaseline or two per cent. yellow oxide of mercury, or paint it with mercurochrome; if necessary cover it with a bit of cotton and collodion, or a piece of gauze fixed with adhesive straps. Everyone should know this technique just as one does to brush the teeth. Corns should be shown to a physician first. Many are immediately relieved by irradiation with X-ray, radium, minor surgery, or a proper shoe.

### Protection from Cancer of the Mouth, Clean and Smooth Teeth. Periodic Visits to a Dentist or Dental Clinic.

*The modern woman is teaching men how to smoke with the least risk of cancer*, because she keeps her teeth clean and smooth, and when properly informed she seeks the examination by a dentist or her physician the moment she experiences a sore spot. No one under the care of a competent dentist should develop cancer of the mouth.

The advantages of visiting your dentist or physician when you observe a sore spot in the mouth; a thorough diagnostic survey properly made will reveal that the sore spot is the beginning of a trench mouth infection which, although not dangerous, may become uncomfortable if neglected. This examination may discover infected tonsils the removal of which protects one



from rheumatism and heart disease and may clear up an obscure indigestion. The diagnostic study may lead to a routine X-ray film of the teeth and the discovery of one or more root abscesses. Neglected root abscesses are the cause of many minor ailments, which ultimately may become serious affairs. Not infrequently in the search for the cause of this little sore spot in the mouth the metabolism test will tell of a slight toxic goiter, of improper diet which is leading to scurvy or purpura. It may be even the first disclosure of diabetes.

Recent experience in a large clinic has shown all of these statements to be true. Therefore, to have a sore spot in the mouth, if you have neglected your annual medical and dental examination, is a good thing.

### **Protection from Cancer in the Region of the Jaws and Teeth.**

*Pain, loose tooth, swelling of the gum, swelling of the jaw, means immediate attention by a physician or dentist, and most thorough diagnostic survey with X-ray films of the teeth and jaws, because this may be the beginning of a cancer, or a local lesion that may lead to cancer at this stage. Whether cancer or not, it should be recognized and cured with the least mutilation. "Any lump that you can see or feel, should be seen or felt by a doctor."*

This depends upon the selection of a dentist before you have a toothache, visiting him and seeing him again when he decides you should, and not when you think it best. There are two dangerous things from neglected loose teeth, such as gum-boils, swellings in the upper and lower jaw about the teeth, and pain. Perhaps the greatest danger of this neglect is that the tumour will grow to such a size or assume such a pathological character that either the upper or lower jaw will have to be completely removed in order to insure the possibility of a cure. Recognized early, with few exceptions, all tumours, benign or malignant, in the region of the teeth or jaws, can be recognized with the aid of the X-ray and the microscope in an early stage, thus the chances of a permanent cure are the best, and this cure can be accomplished with the least mutilation or deformity. Really, cancer of the lining of the mouth and in the region of the jaws is in the hands of the dentist, with the aid of the special oral surgeon, roentgenologist and microscopic pathologist. Every individual has an opportunity to receive the protection of this special group. This can best be done through the dentist.

### **Little Lumps Felt in any Part of the Body, in the Skin, Beneath the Skin, or Deep in the Muscles.**

*Cancer may begin in these lumps whether they be single or multiple. When they are multiple, the malignant tumor as a rule begins in one. Protection against cancer in these subepidermal (in the skin) or subcutaneous (under the skin) lumps can easily be prevented, because everyone as a rule feels the lump before it has become cancer, or, while cancer is confined to the lump only. Protection depends entirely upon the intelligent and courageous reaction of the individual. When you feel one or more lumps, go and ask your physician, or a clinic, to examine it. You will be told to leave the lump alone and report at once if there is any enlargement. In many cases the lump will be irradiated, and, if they do not disappear under X-ray or radium they must be removed by a minor operation under local anesthesia. In some instances, the lump will be removed at once. This is all one is required to know about lumps. This knowledge is easily taught in the primary schools. Every mother, nurse, teacher, gymnasium director, swimming-school teacher*



should be correctly informed on the attitude toward lumps. It does not make any difference whether the lump is painful or tender. The painless one should be examined just as promptly as the painful one. There is no reason for any fear or anxiety when a little lump is felt, providing it is examined by a competent physician at once.

### Protection Against Malignant Tumors of Bone.

*This is becoming more and more evident every day.* It depends upon the diffusion of knowledge in regard to the value of an immediate examination of a bone directly after a contusion or an injury, whether the bone is broken or not, or directly after the first pain or swelling in the region of a bone or joint, whether there has been an injury or not. Some malignant tumors of bone have been cured by irradiation with X-ray or radium alone; some by irradiation combined with the removal of a piece of bone; others by resection of the diseased piece of bone with or without irradiation. The function has been restored when necessary by bone transplantation. Up to the present time, largely because the majority of people are still ignorant of the value of an immediate X-ray examination after an injury or the first sign or symptom of pain or swelling, the majority of sarcomas of bone have been cured by amputation because of unnecessary delay. In one large clinic in this country the actual five-year cures of sarcoma of bone have increased from four per cent. in 1920 to more than twenty-five per cent. in 1931. There is no difficulty, in any part of this country, to get a good X-ray picture, early as well as late, (the earlier the least expensive to the patient or the state) Any physician who takes a good X-ray picture can send the plate to one of the diagnostic centers and obtain from there within twenty-four hours, the most expert reading at the least cost. While waiting the diagnostic survey of the bone lesion, the majority of authorities agree that X-ray treatment ought to be given unless the X-ray film shows a distinctly benign trouble.

### Protection Against Cancer of the Breast.

*Thousands of women who have read the correct information* in the daily press or who have learned it from their family physician, or have acquired the modern habit of annual examinations, have proved that the greatest risk a woman runs to-day if her lump proves to be cancer, is about twenty-five per cent., while the ignorant woman who delays largely because of her ignorance and not of fear, has less than ten per cent. chance of a cure.

Women need no instructions in what the warnings are. They will recognize them in time. But every woman needs special instruction how to act when warned. Recent figures show that when a woman seeks an examination the moment she observes anything unusual in one or both breasts, the chances are that eighty-five per cent. of the warnings will be of such a character and the examination of such a decided finding, that no operation or irradiation with X-ray or radium is necessary. In about fifteen per cent. of the cases a lump of such distinct character will be discovered by the finger of the physician or the transilluminating light, that the lump must be removed, and the lump only. The lump is immediately subjected to microscopic study. In less than one-half the cases, cancer or suspicion of malignancy will be discovered by the microscope, and the complete operation with removal of the breast must follow. In more than one-half of the cases only the lump will have to be



removed and the breast saved. Therefore, the woman who seeks an examination at once, runs the risk of cancer in less than ten per cent. of the cases and increases her chances of a cure from less than ten to more than 70 per cent. Those who delay increase the incidence of malignancy and decrease the chances of a cure.

Without doubt annual examinations of all women and semi-annual pelvic examinations of mothers during which the breast will be carefully surveyed, should increase the protection of women from death by cancer of the breast. We do not know how to prevent the development of cancer in a woman's breast, but we do know how to teach and influence her to have the cancerous lump discovered and properly removed early, so that the chances of a permanent cure are best.

Women, especially mothers who receive semi-annual pelvic examinations, will have greater protection because their breasts will be examined twice a year.

Branches of the Young Women's Christian Association, in which a complete examination is insisted upon, offer further protection to women from cancer of the breast.

### Cancer of the Stomach.

*Almost everyone is familiar with the so-called physical examination of the chest promulgated by a French physician, Laennec, one hundred and twelve years ago (1819). Most people who think, or fear, that they have heart disease go to their physician and say; "Doctor, listen to my heart." On the other hand, most people who have indigestion first take bicarbonate of soda before they see any doctor, and even when they go to a doctor first, they say: "Doctor, give me something for my indigestion," when they should say: "Doctor, examine my stomach with the X-ray." Those people who are learning the value of an immediate examination of the stomach with the X-rays after the first symptoms, have increased the cures of cancer in some clinics from less than two per cent. to more than thirty-five. Billroth, a Viennese surgeon, successfully resected or removed a cancer of the pyloric end of the stomach in 1881, fifty years ago. Roentgen discovered the X-ray in 1895, thirty-six years ago. The first cancer of the stomach to be cured by resection occurred about twenty-five years ago. Twenty years ago, in all large clinics throughout the world, ninety per cent. of cancers of the stomach were inoperable when they were examined by the X-rays and referred to surgical clinic for operation. To-day, in the same clinics, the inoperability has been decreased to less than fifty per cent. It is just as simple, and more certain of a correct diagnosis, to examine the stomach with the X-ray as it is to examine the heart with the stethoscope.*

Another important fact which every one should know: The symptoms, signs or warnings of little things that are not cancer but which may become cancer and the earliest stage of cancer are identical. On this fundamental advice rests the action of having an immediate examination after the first warning. The chief value of an annual examination for everyone and a semi-annual examination for mothers is based upon the knowledge that at these examinations we may discover local conditions that precede cancer or other diseases, or even the earliest stages of cancer; for example, a dangerous mole on a part of the back that the patient neither sees nor feels.



Urgent advice to everyone is: If there should be any fear of any disease, have it in the beginning after the first warning, and let that fear urge you to a proper examination. Fear at the end of a disease only adds to the discomforts, and it is not protective.

My experience teaches me that cancerphobia, hysteria, or any type of nervousness and anxiety about one's health, are never as dangerous as ignorance or procrastination after definite warning. From my personal experience nothing is easier than to relieve fear and anxiety of a hopeless disease after a most thorough examination, at which time one can tell the patient that there is not the slightest evidence of anything serious.

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### The Cost of Sickness.

Dr. McCullough, Chief Health Inspector of Ontario, presented a startling contrast when he stated at Massey Hall that in Canada \$300,000,000 is spent yearly for medical treatment and only \$6,000,000 to prevent the necessity for such huge outlay. Without analysing the statement or inquiring whether the \$6,000,000 includes the costs of periodical examinations of individuals seeking to forestall illness the figures indicate a remarkable tendency to wait until the horse is stolen before locking the stable.

Happily this trait in human nature is not as common as it once was, although as a people we are still too much inclined to drift in matters of health. "It took the curse of war," observed Dr. Jackson, M.H.O., "to awaken many to the absolute necessity of studying the truth of the old saying, "An ounce of prevention is worth a pound of cure," and to awaken authorities charged with the care of the health of the community to a sense of their responsibilities."

Since public consciousness has been aroused great progress has been made. As mentioned by Dr. McCullough, tuberculosis, diphtheria and typhoid fever are not the scourges they once were. This is not because of individual precautions, but because of warfare waged through public channels. The benefit gained in these three instances cannot be measured in dollars. But the field to be covered is as broad as human infirmities. The work to be done has only begun.

Putting the problem in the form of dollars and cents makes it understandable. Only callous people would deny that hospitals must be maintained and must be enlarged to meet growing demands, no matter how costly. Yet if expenditures can be made to reduce the amount of illness and the requirements for hospital space, surely they would be a wise investment. Sickness is expensive in more ways than one. The bill for treatment is only part of it. Health is so valuable an asset that its preservation is warranted at any cost.

This is the point the Canadian Social Hygiene Council is endeavouring to bring to public attention. Its importance is beyond dispute.—*Bridgetown Monitor.*



# Department of the Public Health

## PROVINCE OF NOVA SCOTIA

Office—Metropole Building, Hollis Street, Halifax, N. S.

**MINISTER OF HEALTH** - - - - HON. F. R. DAVIS, M.D., F.A.C.S., Halifax

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Divisional Medical Health Officer - -	DR. C. M. BAYNE, Sydney.
Divisional Medical Health Officer - -	DR. J. J. MACRITCHIE, Halifax.
Director of Public Health Laboratory - -	DR. D. J. MACKENZIE, Halifax.
Pathologist - - - -	DR. R. P. SMITH, Halifax.
Psychiatrist - - - -	DR. ELIZA P. BRISON, Halifax.
Superintendent Nursing Service - - -	MISS M. E. MACKENZIE, Reg. N., Halifax.

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### MEDICAL HEALTH OFFICERS FOR CITIES, TOWNS AND COUNTIES

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Braine, L. B. W., Annapolis Royal.  
Kelley, H. E., Middleton.  
Messenger, Carl, Granville Ferry (County).

O'Neil, F., Sydney (County).  
Murray, R. L., North Sydney.  
Townsend, H. J., Louisburg.

#### COLCHESTER COUNTY

Dunbar, W. R., Truro.  
Havey, H. B., Stewiacke.  
Johnston, T. R., Great Village (County)

#### ANTIGONISH COUNTY

Cameron, J. J., Antigonish (County).  
MacKinnon, W. F., Antigonish.

#### CUMBERLAND COUNTY

#### CAPE BRETON COUNTY

Tompkins, M. G., Dominion.  
Fraser, R. H., New Waterford.  
MacDonald, N., Sydney Mines.  
Archibald, B. C., Glace Bay.  
McLeod, J. K., Sydney.

Bliss, G. C. W., Amherst.  
Drury, D., Maccan (County).  
Gilroy, J. R., Oxford.  
Henderson, C. S., Parrsboro.  
Eaton, R. B., River Hebert (Joggins).  
Walsh, F. E., Springhill.



**DIGBY COUNTY**

Dickie, W. R., Digby.  
Melanson, H. J., Weymouth (County).  
Doiron, L. F., Little Brook (Clare Mcpy).

**GUYSBORO COUNTY**

Chisholm, A. N., Port Hawkesbury (Mulgrave).  
Sodero, G. W., Guysboro (County).  
Moore, E. F., Canso.  
Monaghan, T. E., Sherbrooke (St. Mary's Mcpy).

**HALIFAX COUNTY**

Almon, W. B., Halifax.  
Forrest, W. D., Halifax (County).  
Payzant, H. A., Dartmouth.

**HANTS COUNTY**

Bissett, E. E., Windsor.  
MacLellan, R. A., Rawdon Gold Mines (East Hants Mcpy).  
Reid, A. R., Windsor (West Hants Mcpy).  
Shankel, F. R., Windsor (Hantsport).

**INVERNESS COUNTY**

MacLeod, J. R., Port Hawkesbury  
LeBlanc, L. J., Cheticamp (County).  
Proudfoot, J. A., Inverness.  
Chisholm, D. M., Port Hood.

**KINGS COUNTY**

MacKinnon, Hugh, Berwick.  
Bishop, B. S., Kentville.  
Bethune, R. O., Kentville (County).  
deWitt, C. E. A., Wolfville.

**LUNENBURG COUNTY**

Cole, W. H., New Germany (County).  
Rehfluss, W. N., Bridgewater.  
McKinnon, C. G., Mahone Bay  
Zinck, R. C., Lunenburg.  
Zwicker, D. W. N., Chester (Chester Mcpy).

**PICTOU COUNTY**

Blackett, A. E., New Glasgow.  
McKay, W. A., Thorburn (County).  
Whitman, H. B., Westville.  
Stramberg, C. W., Trenton.  
Dunn, G. A., Pictou.  
Whitman, G. W., Stellarton.

**QUEENS COUNTY**

Ford, T. R., Liverpool (Town and County).

**RICHMOND COUNTY**

LeBlanc, B. A., Arichat (County).

**SHELburne COUNTY**

Brown, G. W., Clark's Harbour.  
Churchill, L. P., Shelburne (County).  
Fuller, L. O., Shelburne.  
Banks, H. H., Barrington Passage (Barrington Mcpy).  
Herbin, C. A., Lockeport.

**VICTORIA COUNTY**

Gillis, R. I., Baddeck (County).

**YARMOUTH COUNTY**

Blackadar, R. L., Port Maitland (County).  
Burton, G. V., Yarmouth.  
O'Brien, W. C., Wedgeport.  
Fox, C. J., Pubnico (Argyle Mcpy).

Those physicians wishing to make use of the free diagnostic services offered by the Public Health Laboratory, will please address material to Dr. D. J. MacKenzie, Public Health Laboratory, Pathological Institute, Morris Street, Halifax. This free service has reference to the examination of such specimens as will assist in the diagnosis and control of communicable diseases; including Kahn test, Widal test, blood culture, cerebro spinal fluid, gonococci and sputa smears, bacteriological examination of pleural fluid, urine and faeces for tubercle or typhoid, water and milk analysis.

In connection with Cancer Control, tumor tissues are examined free. These should be addressed to Dr. R. P. Smith, Pathological Institute, Morris Street, Halifax.

All orders for Vaccines and sera are to be sent to the Department of the Public Health, Metropole Building, Halifax.

**Report on Tissues sectioned and examined at the Provincial Pathological Laboratory from March 1st., to April 1st., 1935.**

The number of tissues sectioned is 167. In addition to this, 47 tissues from 9 autopsies were sectioned, making 214 tissues in all.

Tumours, malignant .....	19
Tumours, simple .....	27
Tumours, suspicious .....	4
Other conditions .....	117
Tissues from 9 autopsies .....	47
	-214



**Communicable Diseases Reported by the Medical Health Officers  
for the month of February, 1935.**

County	Cer-Spi. Meningitis	Chicken Pox	Diphtheria	Influenza	Measles	Mumps	Pneumonia	Scarlet Fever	Tbc. Plumonary	Tbc. other Forms	V. D. G.	V. D. S.	Whooping Cough	German Measles	Paratyphoid	Erysipelas	Pink Eye	Septic sore throat	TOTAL
Annapolis...	5	..	..	12	18	18	1	..	..	..	..	..	..	..	..	..	..	..	54
Antigonish...	..	..	..	7	141	..	..	..	..	1	..	1	..	..	..	..	..	..	150
Cape Breton...	..	..	..	15	50	..	..	..	2	..	..	..	..	5	..	..	..	..	72
Colchester...	2	1	..	85	229	..	1	6	..	..	3	..	..	..	..	..	..	..	327
Cumberland...	..	..	..	250	5	..	6	..	..	..	..	..	..	..	..	..	..	..	261
Digby.....	..	..	..	102	..	..	1	1	1	..	1	..	3	6	..	..	..	..	115
Guysboro...	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	2
Halifax City...	2	3	..	..	18	..	..	27	1	..	..	..	1	13	3	1	..	..	69
Halifax.....	..	..	..	..	..	..	..	1	..	..	..	..	..	4	..	..	..	..	5
Hants.....	13	..	..	30	3	10	..	4	..	..	..	..	..	..	..	..	..	..	60
Inverness...	..	..	..	45	28	..	2	..	..	..	..	..	..	6	..	..	..	..	81
Kings.....	4	..	..	35	46	2	..	..	..	..	..	..	..	..	..	..	1	..	88
Lunenburg...	..	..	..	..	1	..	..	6	..	..	..	..	..	6	..	..	..	..	13
Pictou.....	1	..	..	30	5	..	3	..	..	..	..	..	..	10	..	..	..	..	49
Queens.....	..	..	..	3	..	..	4	5	..	..	..	..	..	..	..	..	..	..	12
Richmond...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Shelburne...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Victoria.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Yarmouth...	..	..	..	8	..	..	..	2	..	..	..	..	..	..	..	..	..	..	10
<b>TOTAL.....</b>	<b>1</b>	<b>26</b>	<b>4</b>	<b>622</b>	<b>545</b>	<b>30</b>	<b>18</b>	<b>52</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>50</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>..</b>	<b>1368</b>

**RETURNS VITAL STATISTICS FOR JANUARY, 1935.**

County	Births		Marriages	Deaths		Stillbirths
	M	F		M	F	
Annapolis.....	16	10	4	10	9	0
Antigonish.....	6	7	6	5	8	0
Cape Breton.....	83	94	66	43	46	8
Colchester.....	20	24	8	15	13	3
Cumberland.....	23	26	20	24	15	4
Digby.....	10	14	6	11	7	0
Guysboro.....	11	12	3	9	4	1
Halifax.....	113	105	68	64	54	9
Hants.....	36	17	9	13	12	3
Inverness.....	22	16	7	20	17	0
Kings.....	14	21	7	9	10	2
Lunenburg.....	30	25	11	25	26	2
Pictou.....	15	28	24	23	23	1
Queens.....	8	12	7	8	3	1
Richmond.....	5	6	3	4	1	0
Shelburne.....	11	3	6	5	5	0
Victoria.....	7	4	2	7	8	1
Yarmouth.....	18	17	2	16	15	3
	<b>448</b>	<b>441</b>	<b>259</b>	<b>312</b>	<b>276</b>	<b>38</b>




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## OBITUARY

WALTER TREMAINE PURDY, B.A., M.D., C.M., AMHERST, N. S.

**M**OST unexpectedly the death occurred in Montreal, early Thursday morning, March 21st, 1935, of Dr. W. T. Purdy of Amherst, N. S., at the early age of forty-eight years. Few of his relatives and friends knew of his illness or his going to Montreal for advice and treatment, and none knew the serious nature of his disease, till Mrs. Purdy was summoned to his bedside just two days before he passed away.

Dr. Purdy was born in East Amherst in September, 1886. He was a son of J. Clarence Purdy, Ex-warden of Cumberland County. His early education was obtained in the Amherst schools, and his Arts course at Mount Allison University. He graduated from McGill University in 1913 and was the Gold Medallist of his class. Following an internship at the Royal Victoria Hospital he settled at Amherst. From that time, due to his skill, his sound training and his pleasant personality, he gradually built up an extensive practice. For the past few years he was greatly interested in X-rays and anaesthesia.

In the death of Dr. Purdy Nova Scotia has lost one of its leading physicians. Amherst will mourn the loss of a skilful physician and a prominent citizen.

Dr. Purdy is survived by his wife, formerly Miss Myrtle Atkinson of Amherst, four children, Margaret, Walter, Robert and Barbara, his father, and one brother, G. T., of Truro.

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The death occurred at Kentville, on Tuesday, March 12th, at the home of her daughter, Mrs. C. L. Baker, of Mrs. Ada Chisholm, widow of the late Dr. Murdoch Chisholm of Halifax.

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Dr. Arthur S. Pearce, one of the best known physicians of Brookline, Mass., passed away suddenly, following a heart attack, on March 18th.

Dr. Pearce was a member of the staffs of leading hospitals at Brookline and also was attached to the Faculty of Tufts Medical School. Dr. Pearce was born at Glace Bay in 1873. He is survived by his wife, formerly Miss Edith Byron, a son, Whitney Pearce of Brooklyn, N. Y., and a daughter, Mrs Ralph A. Hudson of Pittsfield, Mass.



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## Personal Interest Notes

DR. H. MONTFORT HASLAM of Concord, N. H., former well-known Dalhousie University athlete, and Dr. Carleton Metcalf, noted surgeon of Concord, recently spent a few days at Halifax.

Dr. and Mrs. F. S. Messenger of Middleton left a few days ago for the United States where they will spend a week visiting their sons, Charles B. and Dr. Carl F., in Boston and New York.

Dr. H. K. MacDonald of Halifax was the guest speaker at the annual dinner of the Pre-medical Society of Mt. Allison University, Sackville, N. B., held March 30th.

Mrs. G. A. Barss of Rose Bay sailed the end of March from Halifax for a months' vacation in England and other European points of interest.

Dr. H. G. Grant, Dean of Dalhousie Medical College, lectured at Lunenburg on March 21st on "The Conquest of Disease."

Dr. C. B. Trites of Bridgewater sailed on the S. S. "Colburne" on March 22nd for Barbados to be gone about three weeks.

Dr. A. L. Wilkie, son of Mr. and Mrs. C. W. Wilkie, Antigonish, a graduate of St. Francis Xavier and McGill, has recently been appointed to the surgical staff of the Royal Victoria Hospital, Montreal.

Dr. Sidney Gilchrist who is home on furlough from the United Church Mission in Angola, Portuguese West Africa, gave an illustrated lecture at Great Village on Sunday, March 24th.

Word has been received of the appointment of Dr. S. G. MacKenzie of Oxford Street, Halifax, to the Canadian Pension Commission for a period of two years from April 1st.

The many friends of Dr. Roy Clarke, formerly of Newfoundland, will be glad to hear of his appointment as House Physician to Professor Longmead of the University of London.

Large gathering wish "Bon Voyage" to Dr. and Mrs. Dan McDonald. A large number of friends gathered at the railway depot in North Sydney on March 3rd to say farewell to Dr. and Mrs. Daniel McDonald who left for Toronto, accompanied by their daughter Mrs. Amyot. While in Toronto Dr. McDonald will undergo medical treatment and for the present will remain in the Queen City.



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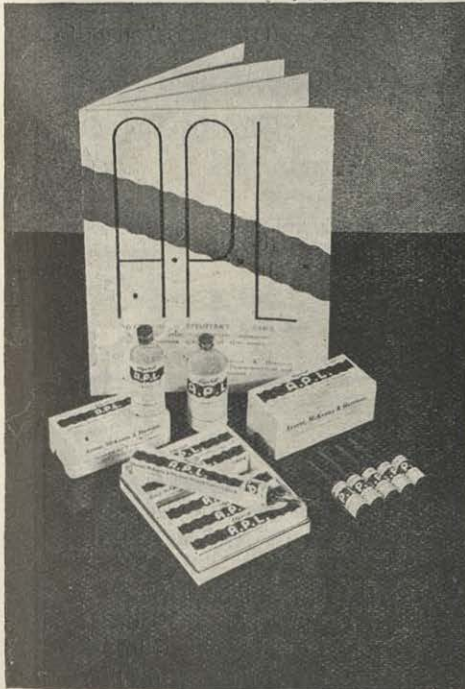
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10 cc. " " " " ..	\$3.60	\$2.10



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CANADA



**Dr. J. W. McLean of North Sydney appointed D. S. C. R. Examiner.** Dr. J. W. McLean received notification on March 19th of his appointment as D. S. C. R. representative thus filling the vacancy caused by the departure of Dr. Dan MacDonald.

Dr. James Bruce of Sydney is home from a holiday trip to Florida. He visited Toronto en route to the south and home again, having made the trip from there to Miami by car, accompanied by his daughter, Mrs. Percy McConnell.

Dr. J. C. Morrison of New Waterford and his brother, Dr. M. D. Morrison, Chief Medical Officer of the Workmen's Compensation Board, Halifax, arrived home early in March from a pleasant vacation trip to the West Indies.

Dr. V. D. Schaffner of Kentville recently returned from a business trip to Montreal.

At the Halifax Infirmary, Halifax on March 2nd to Dr. and Mrs. J. C. Acker, a daughter, Margaret Jean.

At Liverpool, March 8th to Dr. and Mrs. J. C. Wickwire, a daughter, Joan Fraser.

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**T**HIS MAN has received many a warning from his body that all was not well with him.

And he has been given many a scolding by family and friends because of his do-nothing attitude. "I know, I know," he has replied, "but I haven't time to get sick. The office can't spare me. Fellow has to be on his toes every minute these days."

Here you see the result—the man who had to be "on his toes" lies flat on his back. And the office will *have* to manage without him. The bitter truth is that the office will manage without him even if he never recovers.

Cases like this have become almost common these past few years. Any number of people whose health has pleaded for attention, have been "too busy" to do anything about it. They have had the peculiar notion that it is a display of weakness to admit being sick.

That of course is utter nonsense. If you have had warnings that something is wrong,

the only intelligent thing to do is to see your physician. Those warnings may or may not indicate a serious disorder—your physician can tell. If they do, he can start you on the road to a cure or betterment of the condition. On the other hand, if these warnings indicate only some minor disturbance, aggravated perhaps by worry, he can set your mind at rest and institute whatever corrective measures may be needed.

There's no good reason to stay away from the doctor—there is every good reason to go to him. And the sooner you go, the less likely it is that you will have to endure the serious consequences of neglect.

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# Have You Made Out Your Income Tax?

## RETURNS BY MEMBERS OF THE MEDICAL PROFESSION.

As a matter of guidance to the medical profession and to bring about a greater uniformity in the data to be furnished to the Income Tax Division of the Department of National Revenue in the Annual Income Tax Returns to be filed, the following matters are set out:

### INCOME

1. There should be maintained by the Doctor an accurate record of income received, both as fees from his profession and by way of investment income. The record should be clear and capable of being readily checked against the return filed. It may be maintained on cards or in books kept for the purpose.

### EXPENSES

2. Under the heading of expenses the following accounts should be maintained and records kept available for checking purposes in support of charges made:

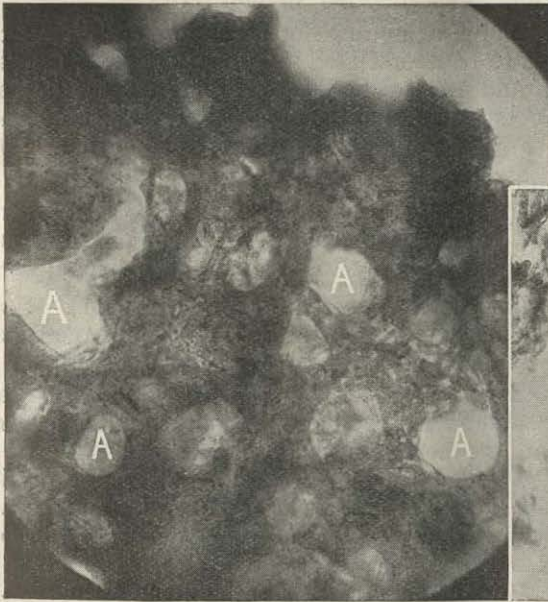
- (a) Medical, surgical and like supplies;
- (b) Office help, nurse, maid and bookkeeper; laundry and malpractice insurance premiums. (It is to be noted that the Income War Tax Act does not allow as a deduction a salary paid by a husband to a wife or vice versa. Such amount, if paid, is to be added back to the income).
- (c) Telephone expenses;
- (d) Assistant's fees: The names and addresses of the assistants to whom fees are paid should be furnished. This information is to be given this year on or before the 31st March, but on or before the last day of February in each subsequent year on Income Tax Form known as Form T-4, obtainable from the Inspector of Income Tax. (Do not confuse with the individual return of income, Form T. 1, to be filed on or before 30th April in each year);
- (e) Rentals paid: The name and address of the owner (preferably) or agent of the rented premises should be furnished. (See j);
- (f) Postage and stationery;
- (g) Depreciation on medical equipment: The following rates will be allowed provided the total depreciation already charged off has not already extinguished the asset value:—



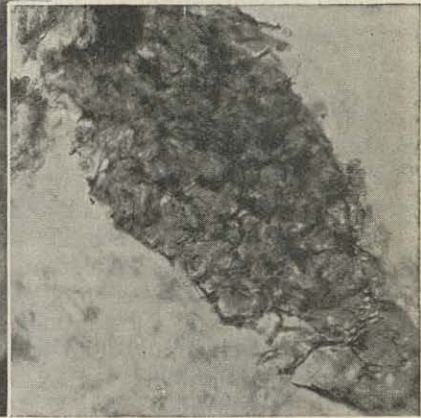
# The cereal-starch of PABLUM is more quickly digested than that of long-cooked cereals

**B**OTHERSOME and expensive long cooking, which is often recommended for infants' cereal, is proven unnecessary with Pablum. For, being precooked at 10 pounds steam pressure and dried, it is so well cooked that it can be served simply by adding water or milk of any temperature. Photomicrographs show that this method of cooking thoroughly ruptures starch granules and converts Pablum into porous flakes which are readily permeable to the digestive fluids. This is supported by

studies *in vitro* showing that the starch of Pablum prepared with cold water is more rapidly digested than that of oatmeal, farina, cornmeal, or whole wheat cooked 4 hours.\*



140 X. STAINED



290 X. STAINED

*Large photomicrograph:* Pablum mixed with cold water—portion of large flake. Pablum flakes are honeycombed with "pores" (note light areas A) which allow ready absorption of digestive fluids. *Inset:* Farina cooked  $\frac{1}{2}$  hour—clump of cereal including starch granules. Note density of clump and lack of porosity. Many starch granules, such as are present in raw cereal, remain unchanged in form.

**F**IFTEEN cereals (both cooked and uncooked) studied microscopically were revealed as containing many starch granules, most of them massed into dense clumps. Such unruptured clumps were never observed in hundreds of examinations of Pablum. Each tiny flake is filled with holes, and like a sponge it drinks up liquids. Hence Pablum can be entirely saturated by the digestive secretions. Besides being thoroughly cooked and readily digestible, Pablum supplies essential vitamins and minerals, especially vitamins A, B, E, and G, and calcium, phosphorus, iron and copper. It is a palatable cereal consisting of wheatmeal, oatmeal, cornmeal, wheat embryo, alfalfa leaf, beef bone, brewers' yeast, and salt.

\*Ross and Burrill, *Journal of Pediatrics*, May 1934. Reprint sent on request of physicians.

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Instruments—Instruments costing \$50.00 or under may be taken as an expense and charged off in the year of purchase;

Instruments costing over \$50.00 are not to be charged off as an expense in the year of purchase, but are to be capitalized and charged off rateably over the estimated life of the instrument at depreciation rates of 15% to 25%, as may be determined between the practitioner and the Division according to the character of the instrument, but whatever rate is determined upon will be consistently adhered to;

The residual value of instruments not heretofore fully depreciated will be depreciated along with instruments costing over \$50.00 purchased subsequently;

Office furniture and fixtures—10% per annum;

Library—The residual value of library not heretofore fully depreciated will continue to be depreciated at 10% per annum for the years 1932, 1933 and 1934 as well as charging off the actual cost of books purchased in those years. After 1934, only the cost of new books will be allowed as a charge.

- (h) Depreciation on motor cars on cost; 20%, 1st year; 20%, 2nd year; 20%, 3rd year; 20%, 4th year; 20%, 5th year. The allowance is restricted to the car used in professional practice and does not apply to cars used for personal use.
- (i) Automobile Expense; (one car): This account will include cost of license, oil, gasoline, grease, insurance, washing, garage charges and repairs;

(Alternative to (h) and (i)—In lieu of all the foregoing expenses, including depreciation, there may be allowed a charge of 10c. a mile for mileage covered in the performance of professional duties).

If Chauffeur is employed for business reasons, so that in the result he is substantially used for business purposes (although incidentally used for personal or family use), the expense will be allowed.

- (j) Proportional expenses of doctors practising from their residence—
- (a) owned by the doctor;
  - (b) rented by the doctor;
- (a) Where a doctor practises from a house which he owns and as well resides in, a proportionate allowance of house expenses will be given for the study, laboratory, office and waiting room space, on the basis that this space bears to the total space of the residence. The charges cover taxes, light, heat, insurance, repairs, depreciation and interest on mortgage (Name and address of mortgagee to be stated);
- (b) Rented premises—The rent only will be apportioned inasmuch as the owner of the premises takes care of all other expenses.

The above allowances will not exceed one-third of the total house expenses or rental unless it can be shown that a greater allowance should be made for professional purposes.