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## Original Articles

### ROSACEA PUSTULOSA

BY GEORGE ELLIOTT, M.D., TORONTO.

By most writers on dermatological affections rosacea pustulosa is described as the second clinical manifestation of acne rosacea, the three being in the order of their appearance, rosacea erythematosus, rosacea pustulosa, and rosacea hypertropica, or rhinophyma. Acne rosacea is a term rapidly falling into disuse, rosacea, as applied to the three stages in the process and of which this has been said to be the climax, superceding it. As rosacea means rosy, and erythematosus redness of the skin, there would seem to be a doubling of terms in the first clinical condition. Would it not be better to describe the first stage as rosacea simplex, the second as rosacea pustulosa, and the third as rosacea hypertropica? The second most often comes under the attention of the physician for treatment.

It is manifestly altogether wrong and unsuitable to define any of these associated affections, outside of perhaps in some cases the third, as a chronic inflammation of the face and nose, generally due to the free use of alcoholic stimulants, or to nickname the affections as "brandy-nose" or "brandy-face." Such is at best only an occasional etiological factor, and should be reserved for those cases where alcoholic addiction actually contributes to the condition.

By far the greater majority of the cases of this often unsightly, disfiguring, common, and somewhat disgusting-looking affection, are of innocent origin. Indeed, the first, rosacea simplex, rarely comes under observation until the pustules—they are perhaps always larger than common acne—are implanted upon the rosaceous or erythematous base. In some cases, however, patients affirm the appearance of pustules antedated the appearance of the rosacea. What can, however, generally be elicited, by close questioning, is preliminary, intermittent flushing of some part of the

classical rosaceous area. This is the middle third of the face, so divided by two perpendicular lines. Thus, as a matter of fact, rosacea pustulosa selects as its particular stamping ground the middle of the forehead between the eyebrows, the nose, the adjacent parts of the cheeks, in the naso-labial folds, the upper lip, and the chin. Once begun, or established in either of these regions, it may spread outwards and come to involve either, or both, lateral thirds of the face, as was seen in one of the selected cases reported below. This middle area of selection is well outlined by Stelwagon who describes it as "a long oval with the chin and middle forehead as the end boundaries and the malar bones as the side boundaries—beyond which rosacea seldom extends to any great degree."

Generally rosacea pustulosa is more often seen in women from twenty to twenty-five years onwards; and derangements of the alimentary canal, particularly constipation, are most likely to be present in all cases. On this account George H. Fox considers "dyspepsia blossoms" more appropriate as a nickname. In women, again, some functional or organic uterine disorder, such as menorrhagia, dysmenorrhœa, or irregular menstruation, may be the exciting cause of rosacea. In others heart and circulatory disorders have been considered at fault; nervous, as frequent emotional attacks. Whatever the constitutional derangement present—and there is always sure to be one or more—it should be diligently searched for, as it is essential to ascertain this in order to success in treatment. There seems to be no difference of opinion amongst dermatologists but that constitutional treatment should go hand in hand with local applications. Hurry, over-exertion, hanging around grate fires, stoves, radiators, as well as coming in contact with steam and hot vapours as in cooking, are all contributing factors in the production of the affection.

In the rosacea pustulosa stage of the affection, rosacea as a whole, marked capillary dilatation and enlargement as well as hyperthropic tissue growth is not generally seen; but there are hyperemia, sometimes deep and of a venous hue, papules, nodules, and very pronounced pustules, generally larger than the lesions of acne vulgaris. In some cases there have been observed an oily seborrhea around the nose, but this is not generally the rule.

Typical cases of rosacea pustulosa present very few difficulties in diagnosis when the erythema, pustules, and oval-of-selection area are borne in mind. Some cases from their position, extending outwards from the sides of the nose to the malar eminences, have been mistaken for the "bat's wing" configuration of lupus erythematosus; whilst others, in the naso-labial folds, may simulate syphilis

and seborrheic dermatitis. The elevated border of lupus erythematosus with the scaling and the projections from the under surfaces of the scales into the openings of the seborrheic glands, distinguish it from rosacea pustulosa; whilst the syphiloderm is circinate or segmentally grouped. If enlarged blood vessels are present syphilis may be excluded. Rosacea has a localized and not a general or diffused redness. Erythematous eczema sometimes attacks the region of the eyes, and care may sometimes be necessary in differentiating it from rosacea simplex. Lupus vulgaris begins earlier in life.

Although rosacea pustulosa is often an affection which has extended over considerable periods of time, two, five and even more years, a complete cure may quite often be safely promised in the great majority of the cases, at best in a few months' devoted treatment, sometimes in a few weeks.

From a series of ten cases treated—eight females and two males—in the past few months, four are selected as representative ones.

*Case 1.*—Miss E. W., twenty-five years of age, single. She had been troubled with constipation for some years; also had pain about one hour after eating; some hyperacidity. For two years she has been affected with erythematous patches covered with nodules and pustules on both cheeks, extending from the middle of the nose to the malar prominences. The patches were rather oval in outline, stood out distinct from the surrounding skin, and were two and one-half inches long by one and one-half inches broad. At one time there was a rosaceous area bridging the nose and so connecting the two lesions. This so simulated the "bat's-wing" manifestation of lupus erythematosus that one of her physicians pronounced the condition such, and cauterized, but without any appreciable curative effect. The lesion on the right side of the face was somewhat worse than that on the left, but on the left side below the patch, and separated by about one-half inch of sound skin, was an isolated pustule. The patient affirmed some pustules and "pimples," as she called the papules, had appeared before there was any rosacea or erythema. She appreciated the fact that sitting before a fire or at a stove—she came from the country—tended to the aggravation of the condition and a fresh crop of pustules. There had also been a few common acne upon the shoulders, but when they had been squeezed out, a black dot was on the tip of the plug. Boils and abscesses on the neck had appeared at different intervals during the past few years, but none was present at examination. They had always ruptured of their

own accord. After two weeks' treatment there was very decided improvement, the bluish tint having faded considerably; some of the pustules had already disappeared. By the end of three months all the pustules were gone, and the erythema had disappeared likewise.

*Case 2.*—Mrs. R., thirty-six years of age, married, related a history of having had at various times, tonsillitis, neuralgia, acute Bright's disease after confinement. Five years previous to presenting for examination and treatment, she began to be troubled with dyspepsia, pain two or three hours after eating, gaseous eructations, and sour-brash. The pulse was normal, tongue clean and moist, appetite then good; heart normal. About the time the indigestion commenced five years ago, a small "boil" appeared at the right side of the nose near the commencement of the naso-labial fold. After that she never was free from large pimples in that region where five or six were always aggregated. It was so offensive to herself that she remained indoors a great deal rather than appear upon the street with such a disfiguring condition. There was one fairly large pustule between the eyebrows implanted upon a rosacea as was the patch at the side of the nose. They had been on the chin but had disappeared spontaneously. The ala nasi of the right side presented a deep flush, whilst the organ appeared broadened and slightly swollen at the tip. Otherwise there was no evidence of ill-health, and no history of alcoholism. Constipation had also been troublesome for a similar period of five years. This case cleared up rapidly upon treatment and was quite restored to the normal in four weeks' time.

*Case 3.*—Miss O. F., twenty years of age, single. She stated she had typhoid fever at four years; never had any indigestion; chicken-pox, the only disease of childhood. Had been troubled with constipation for two or three years; menstruation slightly irregular, as it sometimes lasted seven days, and the discharge very often scanty. She presented the appearance of good health. For four or five years she has had a most unsightly chin. The affection covered the whole skin surface between the vermilion border of the lower lip and the mental process, slanting downwards and outwards from the corners of the mouth. What skin could be seen was deeply stained, and there was not a space where the end of a match could be placed without touching a large yellow pustule or nodule. There was also slight erythema on the tip of the nose. The condition cleared up surprisingly fast under treatment, and by the end of a month there was only one pustule in the middle of the chin, but still a deep rosaceous background.

On the first of July she competed in some foot races, and came back in a week's time almost as bad as ever. Persistent treatment was followed for three months when there was no return of the pustules, and applications of ichthyol every fourth night reduced the erythema.

*Case 4.*—Mr. F. H., forty-seven years of age, married, business man, said his habits were good; only very occasionally partaking of alcoholic stimulants. He gave a history of an attack of herpes zoster some years ago, and some erythematous rash upon the chest which he could not very well describe. He had never had any constitutional diseases of any kind and had quite recently undergone a thorough physical examination at the hands of his family physician who had referred the case. He pronounced him sound and well. The condition started seven or eight months ago; and as he remarked himself the erythema and pustules or pimples had always been on the centre of his face. There were several large ones on the middle of the forehead, between the eyebrows, a large one on the bridge of the nose an inch from the tip, and on the cheeks alongside the nose. There had never been any on the chin, which was bearded. The rosacea simplex was quite pronounced on the middle of the face. There had been some slight constipation for a year or two; and some little insomnia for which the patient had been in the habit of taking seven and one half grains of veronal twice a week. Schamberg says of veronal dermatitis; "I have observed eruptions closely resembling the rashes of scarlet fever and measles. The scarlatinoid rash was accompanied by fever." Whether veronal had anything to do with producing the condition in this patient it would scarcely be possible to assert positively. However, the patient promised to discontinue its use as he thought he could get along very well without it. He did stop it, underwent treatment as outlined below, and returned in two weeks' time without a pustule, and only a slight erythema present in spots for which he is still continuing treatment at the present time.

There are two essentials in the management of the treatment of a case of rosacea pustulosa. The first is the cessation of habits of living which have brought about the condition. The second is the combination of intelligent internal with external treatment. These two essentials must ever be kept in mind to assure success. There is positively very little use in administering drugs and rubbing in ointments or applying lotions, or even treating with the X-rays, if the patient does not guard against all excesses and environments which keep alive the underlying

conditions and so supplying the pabulum for the continuance of the affection.

Patients are themselves sensible of the fact that heat and excessive exercise, such as running, and even "speeding-up" in business (as was noted by himself in the case of the business man above referred to) often results in an exacerbation of the affection. The condition may be expected to become worse when the blood pressure is raised. Over-eating, the incautious use of alcoholic stimulants, even moderate excess in condiments, ginger ale, etc., pastry, pickles, spices; yes, even sausages, pork, and other ingesta, which call for prolonged periods of digestive action, all contribute their quota towards retarding cure. Excitement and anger should be guarded against.

As regards the internal treatment, that depends upon the constitutional condition present. In the cases here reported, and in others, the routine administration of phosphate of soda with nuxvomica three times a day before meals has seemed to be indicated; whilst tablets of a tenth of a grain calcii sulphidum between meals have also been administered, with a semi-weekly dose of mag. sulph. Ringer was the first to suggest sulphide of calcium in pustular conditions. Many writers on pustular affections state they have tried this drug but with no success. Apart from their rather authoritative opinions, it has never been omitted as a distinct part of the treatment adopted.

Externally an ointment of equal parts of the unguentum sulphuris iodidi and vaseline have been ordered to be rubbed in thoroughly every night. This leaves no stain, something appreciable and desirable from the patient's viewpoint.

The pursuit of this treatment in two weeks' time will invariably show pronounced improvement, satisfying to patient and physician alike. A month to three months has been sufficient to cure the most chronic and apparently obstinate case which has come under observation. Sometimes, for a time after the disappearance of all the pustules, the erythema remains, and there has been observed in some cases a slight desquamation of the skin, or the corneum. This may successfully be removed with nightly applications of subnitrate of bismuth and castor oil; or ichthyol in petrolatum, every third or fourth night, as sometimes continued applications of ichthyol have produced pustules.

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## A CASE OF EMPYEMA FOLLOWING AN ACUTE APPENDICITIS WITH OPERATION

BY C. H. HAIR, M.D., TORONTO.

Mr. H. H., aged 20 years, married, clerk, Canadian, well-nourished, presented himself for examination and treatment with a discharging sinus on the right side of the thorax.

The family history—father and mother, alive and well; four brothers and two sisters, alive and well.

The patient's habits are good; no history of venereal disease; no previous illnesses.

He was operated on in July, 1914, at Winnipeg, two days after the onset of the acute appendiceal attack. Two weeks after the operation, patient was suddenly taken with shortness of breath. Later a needle was inserted into the right thorax which showed the presence of pus; and a resection of one rib was done, followed with tube drainage. The discharge has been continuous since, changing in color but often thick, containing blood and usually with a very fetid odor.

On May 6th, 1915, patient was again operated on, an incision being made over fifth, sixth, and seventh ribs, and about two and one half inches of the fifth and sixth ribs removed. The cavity was opened up, cleaned, and drainage tube inserted. It was sewn in with silkworm gut, and muscles closed. The patient remained in the hospital until July 24th, during which time drainage was profuse, and the Sprangle pump was used to increase the flow. One attempt was made to wash out the sinus, using a solution of five per cent. sodium chloride, and  $\frac{1}{2}$  per cent. sodium citrate, but the patient became short of breath, with the appearance of the solution in the mouth and throat. He then attended the out-door surgical department, and has continued to do so since, with an almost constant discharge. Since attending, the most marked symptoms have been a feeling of pressure and pain in the shoulder and a very troublesome cough when the discharge lessens, but which disappears when the discharge becomes more abundant.

On October 28th a fluoroscopic examination showed the cavity to extend up to the second rib, right diaphragm fixed and the heart pulled slightly to the right. There is also a very marked thickening and tenderness over the lower right thoracic border at

the junction of the ribs with the sternum and, on pressure on this area, the flow of discharge can be increased.

*Bacteriological Report.*—Discharge, direct smear, Gram negative; bacilli, Gram, and cocci. Some diplococci, polymorph, nuc's.; lymphocytes; absence of t. b. Endos, slant—bac. mucosis, capsulatus; double sugar—bac. mucosis capsulatus. Sputum, Gram stain-cocci; absence of t. b.

There is very little literature on this particular form of empyema. Jacobson, Vol. II, page 417, in a short paragraph says: There is little room to doubt that infections of the lungs and pleura are mostly embolic and that the liability to them increases with the duration of the appendicitis. It is a fact that these complications, and especially sub-diaphragmatic abscess, are far less common in patients treated with early operation. It stands to reason that portal pyaemia is much more liable to occur in delay.

Osler says you may get extension through the retro-colic veins or new-formed collateral branches of the systemic circulation that may occasion abscess of the lung.

Howard Kelly, page 228, says pleural empyema may be caused by a suppurating appendix, and advises in right-sided affections the examination of the right iliac fossa.

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### A CASE OF SYPHILITIC PERIOSTITIS

BY HERBERT W. BAKER, M.B., TORONTO.

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I desire to present this case for your consideration to-night in the hope, that it may arouse discussion as to the relationship between new bone formation and our various chronic inflammations.

This history is as follows:

William H., male, 14 years old. Complaining of sores on both shins. He has had lumps on his shins as long as he can remember, on the surface of which ulcers developed in December, 1914, following injury. These formed first as lumps which were sore, and after poulticing for about one month, they broke. He has never suffered any inconvenience or pain as a result of this, except the constant necessity of a dressing, as they have never healed up.



## Past history:

Parents state that he was so fat as a baby that he was unable to walk until over two years of age, and that his legs became bowed as a result of his weight. He was nursed by his mother for thirteen months. He has had the usual children's diseases with no unusual complications, his only severe illness being an attack of pneumonia and pleurisy, aged 7, from which he made a good recovery.

## Family history:

Father, age 45, has had asthma for twenty years, with a bad cough. Wassermann, negative.

Mother, age 37. A. and W. Wassermann, positive.

Married for        years.

Seven brothers and sisters living, ranging in age from thirteen years to eleven months, all healthy and show no evidence of disease.

One child, the first, died at 5 months, of dropsy.

Miscarriages, 2. One 13 years ago at 3 mos. One 10 years ago at 2 mos.

## Present condition:

(a) Small underdeveloped, fairly well nourished child, who at present is suffering from impetigo. Has had trouble with his left eye for over two years, now having excoriated lids, the result of removal of his lacrymal sac, which had failed to clear up after an acute infection. Dr. Newbold Jones assures us that this condition has no syphilitic basis. Eyes react to light and accommodation. Tongue and fauces normal. Teeth normal with the exception that he has one upper central incisor missing. Deep reflexes normal. No other evidence of disease excepting quite well marked frontal bosses. (b) Locally both tibiae are markedly bowed forward with evidence of new bone formation, which is convex, and has no sharply circumscribed margin. Over the prominent part of these bones are areas of ulceration. On the left there is a markedly reddened area 3 x 2 on the surface of which there are two other areas irregular in outline denuded of epithelium, having the characteristics of specific ulcers. On the right is a smaller red area with an ulcer on its surface. The skin overlying the tibiae is not adherent. There is absolutely no pain in connection with this condition. (c) Wassermann reaction strongly positive. X-ray shows marked sclerosis of the compact bone on the convex surface of the tibiae in the region of the aforementioned bowing. The sclerosis shades off gradually into the nor-

mal compact bone, having no circumscribed border. The surface of the sclerosis is convex, rough and irregular.

Diagnosis:

From the above data the diagnosis of syphilitic periostitis, plus a certain amount of pyogenic periostitis, due to secondary infection through the ulcerated areas on the skin was made.

Different diagnosis:

(1) Rickets—One would think of this condition which, however, we consider can be readily excluded by the fact that there is absolutely no evidence of the slightest new bone formation on the concave side of the bone, which is so characteristic of the buttress formation seen in healed rickets.

(2) Traumatic periostitis secondarily infected. If this were the case, one would expect to find a sharp limitation of the new bone formation and not the definite, dense sclerosis of the compact bone, extending beyond the site of injury, and having no sharp margin as we find in this patient.

As regards our diagnosis of a syphilitic periostitis we have, first of all the boy's mother giving a positive Wassermann, which presents the opportunity of him being the subject of congenital syphilis, which is borne out by the fact that he himself gives a positive Wassermann. Also the characteristics above mentioned fit in very well with our idea of a syphilitic periostitis.

Treatment:

This boy has been given large doses of potassium iodide and mercury. No mercury has been given by inunction for the reason that we have no assurance that the treatment would be carried out. For the ulcerated areas they are being dressed daily with a 1-4000 bichloride solution. Unfortunately this treatment has not proven as satisfactory as we would wish and we would appreciate any suggestions regarding additional treatment.

Prognosis:

As regards the prognosis we see no reason why this should ever interfere with life nor materially with the function of his legs. Concerning the sclerosis which has already taken place we consider it to be too long standing and so obstinate to treatment to be ever materially lessened, and the fact that he is a male, and that it is a subcutaneous bone which is affected, lying under a skin which presents pathological conditions, it is quite probable that he will always have more or less trouble with cutaneous ulceration due to constant slight traumatisms.

Pathology:

The pathology of this condition is apparently that it is not the result of subperiosteal gummata such as is frequently seen on the sternum clavicle or ribs but that it commences as a definite periostitis because in these subperiosteal gummata one usually finds a worm eaten appearance of the bone and not the regular osteo-sclerosis which we find here. This condition would start with the thickened and chronically inflamed periosteum with a subsequent laying down of subperiosteal new bone. The surface of the new bone in these conditions is usually smoother than that presented in this patient. We explain, however, the irregularity of the surface here by the fact that we have direct access to pyogenic infection through our cutaneous ulceration, and this irregular formation of bone we take to be characteristic of the so-called pyogenic periostitis ossificans.

Summary:

- (1) This appears to be a case which we are definitely of the opinion to syphilitic with a pyogenic infection superadded.
- (2) The most interesting part to our mind is the position and nature of the new bone formation.
- (3) The failures of the therapeutic measures taken also present an interesting phase.

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## Industrial Medicine

### TREATMENT OF HAND INFECTIONS FROM THE ECONOMIC VIEWPOINT

Whilst it is the custom in many medical schools and in hospitals to give very comprehensive instruction concerning the technique of operations such as gastrectomy, bone plating, autogenous grafts, and the approach to the brain by osteoplastic flaps, operations which ninety-nine out of a hundred graduates and ex-residents will never be called upon to perform, the treatment of hand infections is too often left to the common sense and some hazy anatomical knowledge of the student who is prevented from even profiting by his mistakes, since it rarely dawns upon him that better might have been done by one more experienced in this line of surgery. Considering the enormous amount of crippling due to hand infections, Mock's article (*Surgery Gynecology and Obstetrics*, October, 1915), is peculiarly valuable in that it is based on a study of 1,600 cases. He notes that the part played by hand infections in the economy of the industrial world is shown by statistics and statements from various industries and accident insurance companies. Five of the largest accident insurance companies record that 15 per cent. of the total disability is due to hand injuries. In 20 per cent. of these hand injuries the disability is due to infections. Of all hand accidents it is estimated that 65 per cent. of disabilities are the result of minor injuries which have become infected; 35 per cent. are due to other injuries, as broken fingers, lacerations, crushing injuries, etc. Over 50 per cent. of hand deformities are the result of infected injuries. Severe hand injuries, such as extensive lacerations, or severe crushing injuries, seldom become dangerously infected. The nature of these injuries is such that the patients are forced to consult a doctor at once.

Early treatment of all accidents, no matter how slight, would reduce infections to a marked degree. Tincture of iodine is regarded as the most efficient protector, and it is advised that every industry should supply each department with a bottle of tincture of iodine and another bottle containing applicators, and should instruct each employee to paint every wound, no matter how slight, with the tincture of iodine at once, even before reporting to the doctor. Mock installed this system in a large industry and noted

an immediate reduction of 38 per cent. in the number of infections. Practically all of the infected cases failed to use iodine at once. The use of hydrogen peroxide, bichloride wash, or soap and water on a fresh wound is never indicated. These methods tend to scatter the dirt and infection throughout the wound. This is especially true of hydrogen peroxide. The coincidence of tonsillitis and finger and hand infections was noted so often that Mock made a careful bacteriological study of a series of these cases, and as a rule the same germ was found as the cause of both. The increase of hand infection is repeatedly noticed with the increase in tonsillitis. The removal of the tonsils when diseased, therefore, would not only stop the sick disability and the spread of the disease throughout a department as an epidemic, but would be a great preventive measure against infection.

In the firm over which he has control he notes that the total number of infections has markedly decreased in the last two years notwithstanding a 40-per-cent increase in the number of accident cases reported to the doctor's office, and this he believes is due chiefly to the enforcement of the rules that every accident case must report at once to the doctor, and, when indicated, must use iodine at once.

From his study of 1,600 cases of finger and hand infections and their complications during the last three years Mock is convinced that a radical form of treatment of all hand infections is the most economical plan that can be adopted.

Many of the cases were treated as ambulant ones by opening and dressing. When a case threatened to be serious it was always made a hospital one, nitrous oxide being given, and the infection opened, the patient being kept constantly quiet in bed, with continuous hot, moist dressings applied until the acuteness of the condition had subsided. Wide-open radical treatment of these infections means a much more rapid recovery. Many cases of prolonged disability and also of permanent deformities result from a wrong diagnosis of the type of infection and a lack of understanding as to the location of the pus, and inadequate surgical interference—either too small incisions, or at times too large or too many incisions.

Kanavel has demonstrated conclusively that there are certain definite spaces where infection, entering at various points on the hand, tends to spread. These are the synovial sheaths about the tendons, commonest site for the more serious forms of hand infections; the lumbrical and subaponeurotic space at the edge of the palm, where the so-called "collar-button" abscesses form; the

thenar space; the middle palmar space; the hypothenar space; the radial bursa; the ulnar bursa. Through the last two spaces infections usually spread from the hand to the forearm.

The line of treatment lies in early adequate and properly placed incisions; drainage, if any, by rubber tissue; and the use of Bier's hyperemia. *Ther. Gazette.*

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### HAZARDS IN HANDLING GASOLINE

During 1913 in the United States 1,040 persons were burned to death and 3,120 persons injured (a weekly average of twenty persons killed and sixty persons injured) on account of gasoline fires. In harmony with experience respecting human ways and human indifference, the increasing use of gasoline and other liquid fuels which are dangerous because of their ready inflammability will probably increase the number of accidents which cause loss of life as well as great damage to property. Miscellaneous hazards in the use of the inflammable products exist which lead to leakage of these volatile substances and their ignition by spontaneous and unsuspected methods, as well as those due to obvious carelessness. A feature, however, which is not readily comprehended and which is a serious source of danger is the fact that gasoline or gasoline vapor burns, but a mixture of the vapor and air is highly explosive. The Bureau of Mines illustrates the situation in these words: If one takes the cover off a full pail of tightly enclosed gasoline and applies a match to the surface, the gasoline will flare up and burn as long as the gasoline lasts. On the other hand, if one puts a few drops of gasoline in a small tightly enclosed pail, waits a few minutes, and then introduces a flame or an electric spark, a violent explosion will most likely result. In the first case the vapor burns as fast as it comes from the gasoline, and mixes with the oxygen of the air; in the second, the oil vaporizes in the pail and mixes uniformly with the air in it to form an explosive mixture, and on ignition explodes. Consequently, when one hears of a disastrous gasoline explosion one may be sure that it resulted from the mixing of the vapor from the gasoline with air in the proportions necessary to form an explosive mixture. The behaviour of illuminating gas, which burns quietly when liberated alone, but explodes when a mixture with air is heated, is quite analogous. The public has been slow to appreciate these distinctions, and hence they deserve emphasis. At ordinary temperatures, air will hold from 5 to 28 per cent. of gasoline vapor. As gasoline vapor is about three

times as heavy as air, in a room containing a mixture of the vapor with air the vapor is found in largest proportion near the floor. According to the government experts there is needed only a small proportion of gasoline vapor to render air explosive—1.4 cubic feet of the vapor to 97.5 cubic feet of air. One gallon of gasoline can under ideal conditions render 2,100 cubic feet of air explosive. A dangerous feature of gasoline vapor is that it may travel a considerable distance from the gasoline and there be ignited, the flash travelling back to the container of the liquid and causing a roaring fire in a few seconds.—*J. A. M. A.*

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### THE TOXICOLOGY OF BENZENE

The best way to dispel any uncertainty regarding the cause of death by foreign substances is to discover the offending invader in the body itself. When a metallic poison like arsenic or a toxic alkaloid like strychnine can actually be isolated from a dead body in quantities sufficient to constitute a fatal dose, no further evidence of the source of harm is ordinarily required. There are poisons, however, which evade detection because they are susceptible to rapid change in the organism, while still other harmful substances may elude identification because of the inadequacy of some of the technical methods at present employed in toxicologic analysis. This appears until lately to have been the case with benzene (benzol) which, though not as yet an important source of danger in this country, is now becoming more conspicuous as a cause of poisoning in man. Benzene, which is a definite chemical compound ( $C_6H_6$ ) derived from coal tar, must not be confused with benzine, a mixture of volatile hydrocarbons, derived from petroleum. The older textbooks on toxicology have little to say about benzene or the hydrocarbons that commonly accompany it in the industries. A growing source of danger lies in the inhalation of benzene vapors. When benzene is taken by the mouth it appears to be poorly absorbed. A part is said to be excreted by the lungs, and a small fraction may even be oxidized slowly in the body. At the pharmacologic institute of the University of Berlin, Joachimoglu has succeeded in perfecting a method for detecting benzene and measuring the quantity present in animal tissues. By this means, interesting facts regarding the distribution of the poison in the body have now become available. It has been demonstrated that in benzene intoxication the brain and spinal cord contain relatively more of the organic poison than do any

other organs. This is without doubt related to the fact that, owing to its solubility in fats and fatlike compounds, benzene has a natural "affinity" for the lipoid of the nervous tissues. The same distribution, for comparable reasons, has been made for chloroform and acetone. Similar findings are also to be expected in the case of toluene (toluol, methyl benzene) which, though chemically closely related to benzene, has less practical importance with respect to the possibilities of industrial poisoning.—*J. A. M. A.*

### THE POSSIBILITIES OF POISONING WITH CARBON MONOXIDE

The progress of science and the improvement of industrial conditions have made possible the prevention and elimination of many hygienic dangers that beset man in his daily life. At the same time, newer modes of living and processes of manufacture have brought novel and often unanticipated menaces to the welfare of those who are concerned with them. An illustrative instance of this is the history of carbon monoxide as a source of poisoning. This product has long been known as a harmful admixture in certain combustion products; and, when attention was directed to it from time to time, steps were taken to avoid the danger involved. Mild types of ordinary combustion product poisoning still occur occasionally in homes as the result of heating apparatus with poor drafts, in gas plants, and in other places, but they are recognized and subsequently averted by proper ventilation. The installation of large electric furnaces, such as those in use at Niagara Falls, brought the possibility of carbon monoxide poisoning in an unusual way. Tons of the gas are liberated in these plants every day, but provision is made for its prompt oxidation to carbon dioxide so that no harm whatever is threatened except when there is an occasional temporary imperfection in the oxidation and ventilation arrangements. The danger from illuminating gas has increased with the augmented use of "water gas" in this country. This is particularly harmful because of its large content of carbon monoxide. It furnishes a considerable proportion of the deaths by poisoning. A "miner's disease" of some interest has been associated with carbon monoxide derived principally from explosive used in blasting. The domestic forms of poisoning with carbon monoxide gas from the use of defective heating appliances are not always of moderate severity. Usually headache, nausea and circulatory failure are the sole symptoms; but the cases may often assume a more serious aspect. This is pos-



sibly owing to the subtle ways in which the poison gains unsuspected entrance into the system. There may be repeated exposure to danger which does not reveal itself until a careful investigation is made. It is sometimes almost impossible to detect the presence of the gas and to determine what part it plays in symptoms of malaise. Even small percentages of carbon monoxide become a menace to health when the intoxication takes a chronic form. For this reason, if no other, every source of poisoning with this gas should be ascertained when possible. That carbon monoxide can arise in connection with cooking by gas has been demonstrated anew by Meyer. Whenever a gas flame comes into contact with cold surfaces the possibility of imperfect combustion arises, and the products will include more or less carbon monoxide. Conditions for this are found in the arrangement of many of the gas water heaters that have attained considerable popularity in recent years. Complaints of headache and mild symptoms of carbon monoxide poisoning are sometimes presented by kitchen or laundry workers who are accustomed to remain in poorly ventilated rooms containing modern household devices of the sort referred to. The institution of suitable hoods and drafts is an essential part of any larger outfit of such gas heating appliances. The danger of combustion gas poisoning is thereby averted. The gas engine and the gasoline motor have also brought with them the unanticipated possibility of inducing intoxication from carbon monoxide. Whenever the explosion of the combustible mixture is incomplete or of moderated intensity, this gas may be formed in not inconsiderable amounts. Outdoors this is of little consequence; but indoors carbon monoxide as well as other combustion gases of the omnipresent motor may produce dangerous contamination of the atmosphere. This should now be widely recognized in the interests of hygiene.

—J. A. M. A.

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### THE DANGERS OF RUBBER MANUFACTURE

The rubber industry in the United States is important, employing tens of thousands of men and women, and increasing continually. Whether or not it is attended with risk to the health of those engaged in it, and is to be classed as a dangerous trade, most of us would be unable to say. In Germany and France it is considered a decidedly dangerous trade, and many cases of poisoning from carbon disulphide used in vulcanizing rubber are recorded in the literature of those countries. In one rubber manufacturing city, Leipzig, Laudenheimer, found fifty cases of carbon

disulphide insanity in Flechsig's clinic, and this substance is still largely used in German rubber works. In a recent French publication are described eight cases of mental breakdown among thirty men who were using carbon disulphide in pasting rubber strips on belting. In the British reports of earlier years this poison and naphtha (used in making rubber cloth with a paste of rubber and naphtha) were said to be the cause of much ill health and serious nervous trouble among girls especially, and though the use of carbon disulphide has been largely given up now, the fumes of naphtha are still a troublesome feature in British rubber works. Another volatile poison frequently mentioned in continental reports is benzenè (benzol,  $C_6H_6$ ), more poisonous than benzine and naphtha, and cheaper than the latter over there.

A bulletin dealing with the use of poisonous substances in the rubber industry in this country has just been issued by the federal Bureau of Labor Statistics as part of a series on industrial accidents and hygiene. The basis of this report is an investigation of rubber factories in different parts of the country manufacturing all varieties of goods. It is surprising to learn that so many poisonous substances are used in this industry. The list includes lead compounds, such as litharge, the basic sulphate of lead, the basic carbonate of lead, and red lead; aniline oil; sulphides of antimony; petroleum products; coal-tar benzene; carbon disulphide, and carbon tetrachloride. In addition to these compounds, concerning which definite information could be obtained, Dr. Alice Hamilton, who prepared the report, learned of the use in reclaiming rubber, of various phenols of different degrees of crudity, and also of pine oil, turpentine, tar, and a product of the action of carbon disulphide on aniline known as thiocarbonilide. The rubber industry has many trade secrets, and information about all the compounds in use, especially in rubber reclaiming, was difficult to secure.

In spite of this array of poisons, the report does not characterize the rubber industry in this country as an inherently dangerous trade. What danger there is, and it is evident that most factories are far from safe in certain departments, come from carelessness in the handling of poisons so that preventable dusts and fumes are allowed to escape. This was found to be true in almost all the factories inspected, even the best. That such accidents are not more generally known is explained by the fact that out of the whole force in a plant only a small proportion engage in work exposing them to poisoning, so that even if the sickness rate among them is high, it makes little impression.

In comparing American methods of manufacture with the European, the advantages are seen to be on the American side. We do not use carbon disulphid in vulcanizing to any great extent. Dr. Hamilton states that she found only 130 men using this substance in all the factories visited, and she contrasts this with a statement of the German factory inspectors' report for 1910 concerning a single factory in which the installation of a certain machine had replaced the work of 150 women vulcanizers. No women do this sort of work in America. Another reason for the comparative safety of rubber work in America is that most of our rubber cloth is made on calenders, by pressing thin sheets of rubber into the fabric, and then vulcanizing by heat. In England and on the continent the usual method is by "spreading," that is, pressing a paste of rubber and naphtha or benzene into the fabric and then letting the volatile part evaporate, and finally vulcanizing by means of carbon disulphide. This method is used also in America, but only exceptionally, as benzene is too expensive to be used in large quantities.

These advantages are great, yet according to the report they are not sufficient to make the industry altogether free from danger, in the absence of proper precautions. Consequently lead poisoning is not uncommon among the men employed in compounding rubber and mixing it on the mills. Acute, severe benzene or naphtha poisoning is said to be rare, but mild chronic poisoning is probably very common among the men and women who apply rubber cement. The toxicity of antimony pentasulphide was so much in doubt, being practically ignored by the toxicologists, that the bureau asked Prof. A. J. Carlson to determine whether or not there was any danger in the use of this compound. Carlson's report is found in the appendix to the bulletin. He tested the golden and the crimson sulphides with human gastric juice, and found that about 3 per cent. of the former and 8 per cent. of the latter passed into solution, showing that there is a possibility of poisoning in the case of workmen exposed to large quantities of the dust, as is true in rubber compounding.

Carbon disulphide is said to be unknown as an industrial poison to physicians in this country, even to those in rubber towns; yet the investigators were able to discover cases of carbon disulphide psychosis and paralysis among the vulcanizers of dipped goods and the splicers of inner tubes for tires. Dr. Hamilton suggests that other cases would perhaps come to light if the industrial history of the inmates of certain Ohio insane asylums were studied as Laudenheimer studied those in Leipzig.

Carbon tetrachloride is a new substance in the rubber industry, introduced because of its noninflammable character to take the place of the highly inflammable carbon disulphide as a vehicle for sulphur monochloride in vulcanizing thin or highly colored goods, or in splicing inner tubes. Waller in England and Lehmann in Germany have shown that it is decidedly toxic; according to the former twice as toxic as chloroform, according to the latter rather less so than chloroform. It is less dangerous, however, than the disulphide.

Aniline oil, also unfamiliar as an industrial poison in America, is shown to be fairly common, especially in tire works and in the reclaiming of rubber, and it is said that the exposure to aniline fumes is increasing since we have had to begin to manufacture our own aniline, the German supply having been cut off. This is an insidious poison, for the odor is pleasant and the fumes do not give warning of their harmfulness by irritating the eyes and throat, as do most volatile poisons. Cases of aniline poisoning are said to be well known in Akron, Ohio, and the victims are referred to as "blue boys," from the cyanosis which is the most striking symptom. The researches of Lehmann are quoted to show that very small quantities of aniline are needed to produce toxic symptoms, and a study of aniline poisoning in Akron plants by Rev. V. Luce is appended to the bulletin.

The rubber industry is thus seen to be a fruitful field for the study of some of the rarer industrial poisons. Nor do the ones described here complete the list. New compounds are continually being introduced and experimented on, some of them substances about which very little is known. Medical research on the effects of these substances on the human organism should keep pace with the chemical research into their value as compounds or vulcanizers.  
—J. A. M. A.

# Dominion Medical Monthly

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## COMMENT FROM MONTH TO MONTH

**Drug Addiction** offers a fertile field for cultivation on the part of the busy reformer. Whilst there is no means of knowing just how rapidly and how enormously "dope fiends" have multiplied in the last twenty years, there is plenty reason to fear the practice of taking harmful drugs, as opium, morphine, cocaine, heroin, etc., is greatly on the increase both in the United States and Canada. Should drug addiction be made an indictable offence?

There is no doubt more of these are coming under the attention of the physician in the United States since the enactment of the Harrison Narcotic Law; and it seems to be incontestably shown that as a State goes "dry," it also becomes "drugged." What wonder if the unfortunate jumps from the frying pan into the fire! No doubt some alcoholics, deprived of easy access to the bar, readily adapt themselves to the more congenial environment of the drug store. But whilst it may be the case in some instances that insatiable thirst is not satisfied with alcoholics alone, but must needs, as well, be associated with drug appetites, it does not appear to be the rule in the majority of individuals. Possibly fully two-thirds of all drug addicts are purely so, and

have never taken alcohol at all. And what a wreck is the drug drunk!

From alcohol men will sometimes reform of their own free will, but from morphine and cocaine, they seldom or never. They seem to follow out to the word De Quincy's observation: "I do not readily believe that any man having once tasted the divine luxuries of opium, will afterwards descend to the gross and mortal enjoyment of alcohol." Having once tasted, or being once enveloped, their doom is almost sure.

How are all these drug addicts produced? McIvor and Price (*J. A. M. A.*), in a close study of a series of hospital cases have come to the conclusion that the largest single factor in the production of morphinism has been professional medication. In their series of 147 drug addicts studied and treated, thirty-eight took morphine exclusively, and out of that number twenty-eight learned of the effects of the drug through its hypodermic administration by the physician, or through a *physician's prescription*. The italics are editorially used, and being so used, present food for reflection. Practically all teachers of medicine warn students, when practitioners, never to place hypodermic syringes in the hands of patients. If prescriptions are re-filled by druggists, the professional man is not to blame.

It does not appear that any stigma can be attached to the profession so far as cocaine and heroin are concerned.

Block (*N. Y. M. J.*) says: "Normal persons never become drug habitues." Anyway, if they do, they are easier cured if the cause is removed.

How is this evil to be prevented? Is it to be by the prohibition of manufacture, importation and sale thereof; or by the abolition of the drug store?

In the prevention of alcoholics and drug addicts there are latent possibilities, and preventive medicine may some day play a conspicuous part in such social problems.

In the meantime, however, until legislators awake to their opportunities, the profession must continue to do their best to treat and cure both alcoholics and drug addicts. In the treatment of the cases cited above the best method proved to be gradual withdrawals of the drug with free purgation as in the Lambert treatment, and sedatives and stimulants as required in the individual case. This can best be carried out in some institution or hospital.

## Reviews

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*The Clinics of John B. Murphy, M.D., at Mercy Hospital, Chicago.* December, 1915. Philadelphia and London: W. B. Saunders & Co. Canadian Agents: J. F. Hartz Company, Toronto.

As is now well known, Murphy's Clinics is a record of cases in which the history of the cases is given, the operation described, and Doctor Murphy's comments on each case. It is particularly valuable for surgeons. The present volume keeps up the excellent standard originated in the early volumes.

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*Handbook of Medicine.* By WILLIAM R. JACK, B.Sc., M.D., F.R.F.P.S.G., Physician to the Glasgow Royal Infirmary, etc. Edinburgh: E. & S. Livingstone. Price, 8s. net.

A close examination of this handbook of medicine, now in its fifth edition, and the reading of some of the articles, convinces us it is a good book for medical students, especially to gain a concise knowledge on short notice, and very helpful as a review manual just prior to examination time. It is not intended to fully cover the field, but only as an aid in acquiring a working knowledge of the subject.

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*Practical Cystoscopy and the Diagnosis of Surgical Diseases of the Kidneys and Urinary Bladder.* By PAUL M. PILCHER, M.D., Consulting Surgeon to the Eastern Long Island Hospital. Second edition, thoroughly revised and enlarged. Octavo of 504 pages, with 299 illustrations, 29 in colors. Philadelphia and London: W. B. Saunders Company. 1915. Cloth, \$6.00 net; half morocco: \$7.50. Sole Canadian Agents: The J. F. Hartz Co., Ltd., Toronto.

This book is beautifully illustrated, and although the principles of cystoscopy have changed but little in the past four years, still a new edition, with additions, is satisfactory as assuring that the best is herein to be obtained upon the subject. An entire new section is devoted to pyelography. Other chapters have been entirely rewritten. The therapeutic uses of the cystoscope are abundantly set forth.

*Surgical Operations with Local Anesthesia.* By ARTHUR E. HERTZLER, A.M., M.D., Ph.D., F.A.C.S., Surgeon to the Halsted Hospital, Kansas; Surgeon to the Swedish Hospital, Kansas City, Mo.; Surgeon to the General Hospital, Kansas City, Mo. Second edition; 327 pages, 173 illustrations; cloth bound. New York: Surgery Publishing Company. Price, \$3.00.

The rapid sale of the first edition covering minor surgery and the demand for a more complete work upon the subject covering both major and minor surgical work, has induced Doctor Hertzler to present this second volume, which for completeness as to detail and price we believe places it in a class by itself among those textbooks upon this most interesting and growing subject.

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*Bandaging.* By A. D. WHITING, M.D., Instructor in Surgery at the University of Pennsylvania. 12mo of 151 pages, with 117 original illustrations. Philadelphia and London: W. B. Saunders Company. 1915. Cloth, \$1.25 net. Sole Canadian Agents: The J. F. Hartz Co., Ltd., Toronto.

This little book is opportune at the present time, owing to so many medical men being required for service in the European battlefields. It will help wonderfully to review bandaging, learned in school-days, but often perfunctorily performed. It is well illustrated, and one can readily learn from these and the text how the perfect bandage should be applied.

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*American Illustrated Medical Dictionary (Dorland).* A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Science, Nursing, Biology, and kindred branches; with new and elaborate tables. Eighth revised edition. Edited by W. A. NEWMAN DORLAND, M.D. Large octavo of 1,135 pages, with 331 illustrations, 119 in colors. Containing over 1,500 more terms than the previous edition. Philadelphia and London: W. B. Saunders Company. 1915. Flexible leather, \$4.50 net; thumb index, \$5.00 net. Sole Canadian Agents: The J. F. Hartz Co., Ltd., Toronto.

Dorland's has for several years been one of the standard medical dictionaries. That is seen from just bearing in mind this is the eighth edition. It is needless to say it has been carefully revised and brought up-to-date. No better dictionary is before the profession, although there are some good ones.



*Painless Childbirth.* By DR. CARL HENRY DAVIS. Chicago: Forbes & Co. Price, \$1.00.

A book of unusual importance has just appeared, written by Dr. Carl Henry Davis, of Rush Medical College and The Presbyterian Hospital of Chicago, entitled "Painless Childbirth, Eutocia and Nitrous Oxid-Oxygen Analgesia." This book is important for two reasons: it is the first book by an obstetrician to thoroughly discuss the various methods employed in the attempt to secure painless childbirth; and, secondly, it is the first report of the results of varied experience with the nitrous oxid-oxygen analgesia, which will undoubtedly become the analgesic of choice in obstetrics.

The first part of the book traces the development of the attempts to relieve the suffering of labor. The chemistry, pharmacology and toxicology of the various analgesics are compared and their advantages and disadvantages considered with unbiased fairness.

In the second part of this volume eutocia is given as the goal for which the physician is striving.

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*A Manual of Pathology.* By GUTHRIE McCONNELL, M.D., formerly Professor of Pathology and Bacteriology, Temple University, Medical Department, Philadelphia. Third revised edition. 12mo volume of 585 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1915. Cloth, \$2.50 net. Sole Canadian Agents: The J. F. Hartz Co., Ltd., Toronto.

This is a well-arranged and well-written book. The new edition brings it abreast of present-day pathology and bacteriology. The student will find it a very explicit textbook, while the practitioner may study it with profit as giving a working manual which will briefly keep him in touch with the general and specific parts of the two subjects.

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*Instinct and Intelligence.* By N. C. MACNAMARA, F.R.C.S. London: Oxford Medical Publications. Toronto: McAinsh & Co., Limited. Price, \$2.00.

In the pages of this little book an effort is made to determine the training of the intellect, and that the behaviour of human beings depends upon the work performed by definite parts of the brain. It is an inquiry into how far education can go in developing intellectual phenomena. It will aid in understanding how to build up in the child a chaste and self-reliant character.

## News Items

### ONTARIO MEDICAL ASSOCIATION

The programme for the Annual Meeting of the Ontario Medical Association, which takes place at Toronto May 30th to June 2nd, is well in hand, and although some details have still to be completed, we are able to give a provisional outline of the discussions and papers which have been arranged.

The address in Medicine will be given by Dr. Elliott P. Joslin, of Boston, on the Treatment of Diabetes. A symposium on the Rôle of the Mouth, Throat, Nose and Accessory Sinuses in Disease has been arranged, in which Doctor Goldthwait, of Boston; Dr. Weston Price, Cleveland; Doctor Wishart, Toronto, and others will take part. Doctor Percy will give the address in Gynecology.

Owing to the increasing problems presented by the war, in its medical aspects, a meeting of Military Medical Officers will be held.

Sectional meetings will be held in Medicine, Surgery, Obstetrics and Gynecology, and Eye, Ear, Nose and Throat. A large number of papers have been arranged for the Medical Section, including "Treatment of Pneumonia," by Dr. Solomon Solis-Cohen; "Neurosis in Returned Soldiers," Dr. G. Howland; "Effects of Gases on Soldiers," Doctors Elliott and Tovell; "Typhoid Inoculation," Dr. George Porter; "Tuberculosis," Doctor Parfitt; "Cerebro-Spinal Meningitis," Captains Fitzgerald and McClennahan; "Canadian-made Drugs," Professor Blackader, Montreal; "The Wassermann Reaction in Relation to Diagnosis and Treatment of Syphilis," Professor Connell, Kingston; "Duodenal Feeding with Tube," Doctor Cleaver, New York; "Treatment of Lues in Children," Dr. George Smith; "Treatment of Cancer," Dr. W. H. B. Aikins; "Pernicious Anemia," Dr. Chas. Mackay, Seaforth. Papers have also been promised by Major J. W. S. McCullough, Dr. Alan Brown, Doctor Campbell, Napanee.

In Surgery there are papers on "Appendicitis," by Dr. M. O. Klotz, Ottawa; "Gall Stones," by Doctor Olmsted, Hamilton; "Pyloric Stenosis in Infants," by Dr. W. E. Gallie, Toronto; "Fractures," by Dr. G. M. Rogers, Ingersoll; "Intestinal Obstruction," by Dr. H. A. Bruce, Toronto; "Renal Calculi," by Dr. W. W. Jones, Toronto; "Transfusion," Dr. C. L. Starr, Toronto;