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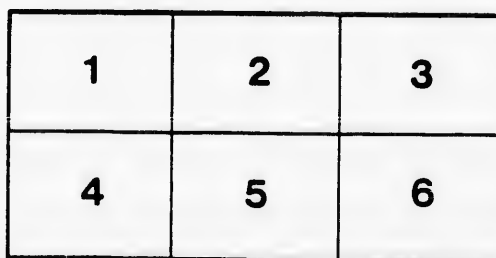
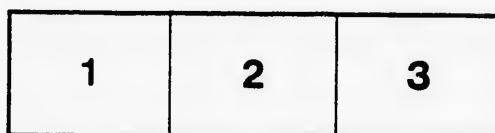
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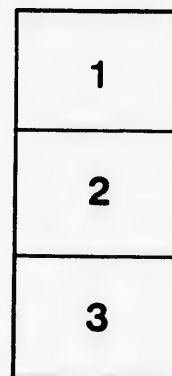
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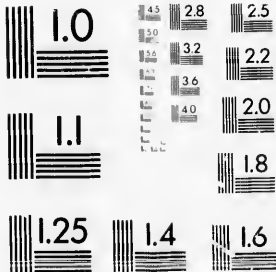
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NOTES

—ON—

PRACTICE OF MEDICINE.

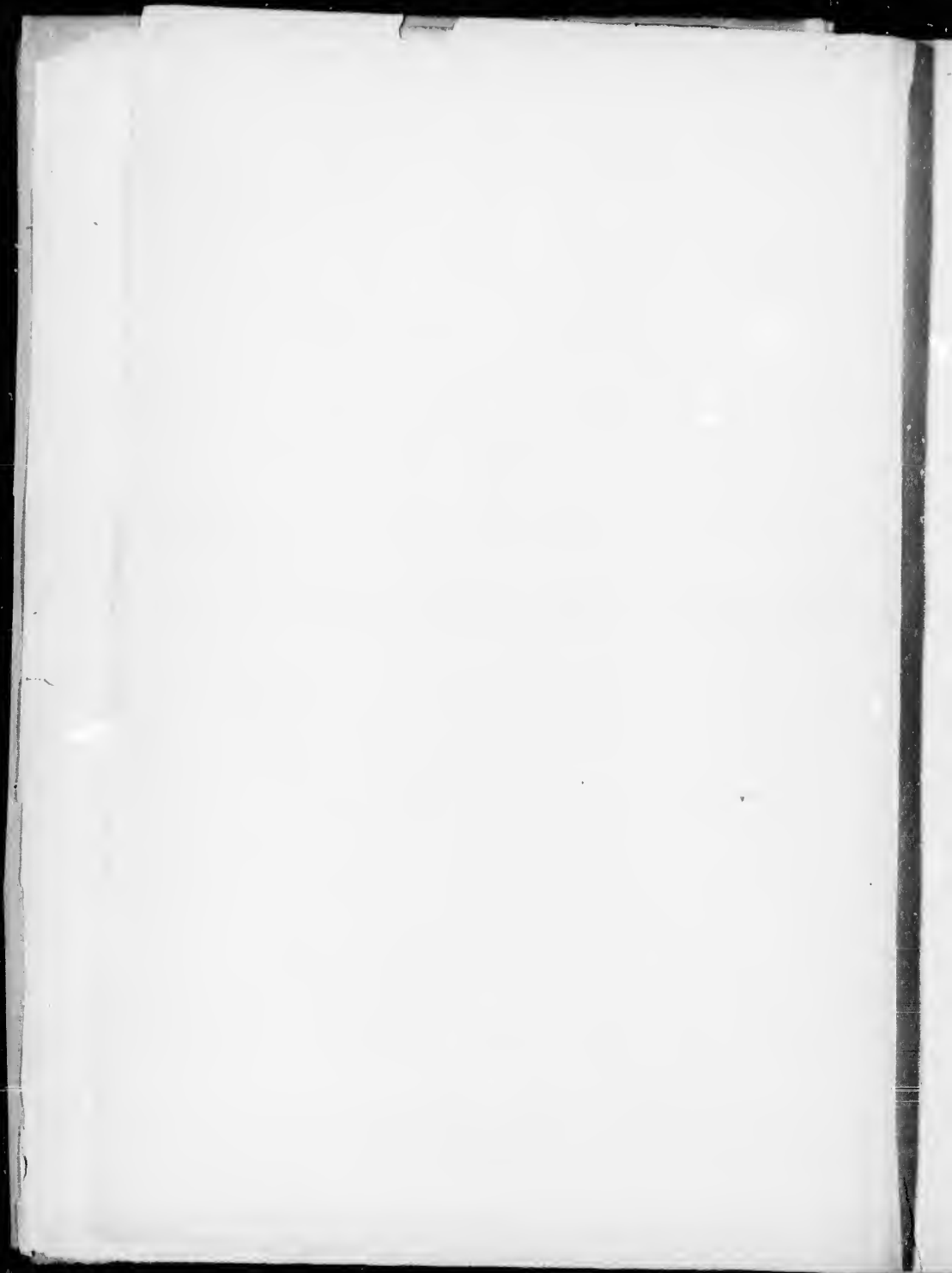
By - Dr. R. P. Howard

late -

*Dean of McGill University and
Professor of Medicine*

Revised & with few additions by - Dr. Geo. Ross.





PRACTICE OF MEDICINE.

Internal Pathology is divided into special and general. General Pathology will be dealt with by Dr. Mills. Special Pathology consists of items regarding individual diseases, facts, etc. An important branch of this is special therapeutics—to improve or to retard. Prophylaxis is preventative medicine, and is a branch really of sanitary medicine.

DEFINITION OF DISEASE.—It is an abnormal condition of structure or function, or generally both, of a part or the whole of the body, including all changes, as color, form, consistence, every unusual distribution of the fluids or alteration in their state, any altered movement, any mal-operations of the organs of the body, etc. No new powers operate in disease, but only powers natural to the body operate, so disease is a disturbance of some function and an effort of nature to restore the equilibrium. In describing objects, names are necessary, hence classification.

CLASSIFICATION.—There is no satisfactory and perfect classification, as knowledge is not perfect. Here is London 1885 classification based on the causation of disease. Diseases are divided into general or local: *General* diseases are those of the whole body, or else when disease is distributed in several parts at once. *Local* diseases are of individual parts.

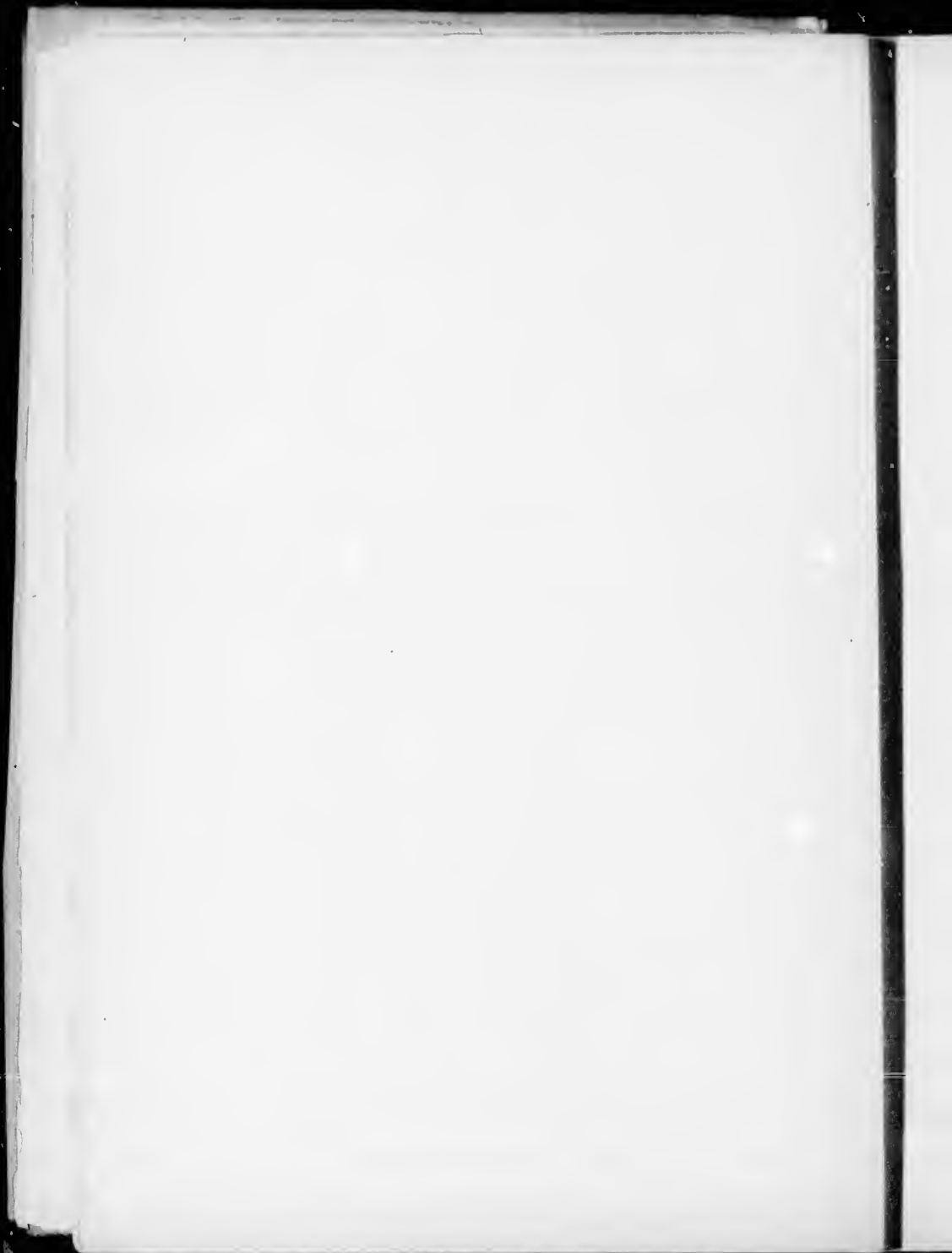
GENERAL DISEASES are subdivided into 4 classes, according to cause: (A) Morbid poisons, as febrile; (B) diseases depending on external agents other than morbid poisons; (C) developmental diseases; (D) unclassifiable. These 4 again become subdivided. (A) this is the great zymotic class, and is divided into 5 sub-groups: 1. Exanthematic or allied groups (eruptions), including acute specific fevers, variola, vaccina, varicella, morbilli, scarlatina, dengue, plague, typhus, typhoid; all have a more or less characteristic eruption on the skin. Closely attending or relapsing fever, continued fever, febricula, cerebro-spinal fever, yellow fever, Asiatic fever. Another group of Exanthems are what are called mucous fevers (?), as epidemic diarrhoea, dysentery, diphtheria, mumps, influenza, whooping cough and simple cholera. 2. Malarial fevers, as ague. 3. Septic diseases—septicæmia, phagadæna, pyæmia, hospital gangrene, erysipelas. 4. Venereal diseases—syphilis, gonorrhœa. 5. Febrile diseases communicable from animals—glanders, farcy, anthrax and hydrophobia equina. (B) Diseases dependent on external agents other than morbid poisons, subdivided into 4 groups: 4 Diseases due to animal and vegetable parasites, as tinea, worms. 2. Poisons of animals or of vegetables, inorganic poisons, lead, arsenic, etc. 3. Diseases of injury, traumatic, climatic, etc. 4. Diseases produced by errors of diet, as scurvy, alcoholism, starvation, ergotism. (C) Immaturity (developmental dis-



eases), malformations, debility, old age. (D) Non-classifiable, or constitutional, due to defective physiology, as leprosy, parangi, tuberculous, scrofula, rheumatism (acute and chronic), gout, osteo-arthritis, anaemia simple and pernicious, chlorosis, lupus, haemophilia, diabetes, glaucoma, malignant and non-malignant growths, cysts, cretinism, rickets, leucocythemia, myxoedema, are diseases of endopathy—3 former classes are exopathy.

LOCAL DISEASES are named according to organs (or locality affected): 1. of organs as of eye, liver, lymphatics, spleen, ductless glands. 2. Urinary tract, 3. Generative tract, mammae, etc. 4. Organs of locomotion. 5. Diseases of cellular system. 6. Diseases of cutaneous system—16 in all. Structural changes in tissue produce the following lesions: Hypertrophy, atrophy (bulk), congestion (hyperemia) active or passive, anemia, hemorrhage, dropsy—these last 4 often nearly related. Inflammation with its effusions, productions and terminations, as serous and plastic effusions, suppurations, ulcerations. Healing process, cicatrization, degenerations, fatty, calcareous, waxy, fibroid, mucous, colloid, amyloid, or lardaceous, pigmentary, hyaline, this specially affecting the fibrous tissue, granular, or parenchymatous or cloudy dropsical degeneration of cells. New growths, malignant or simple cysts, tuberculous. Mechanical, as displacement, dislocation, stricture, compression, plugging, perforation, laceration, rupture, fracture, distention. Concretions, as coagula or calculi. Errors of development. Malformations. Disorders of functions, as convulsions in muscle; lack of function, as paralysis and perversion, as when cold seems hot. Roberts is best edition for students; Flint ditto for practitioner; Bristowe ditto for practitioner. Cooper's *Vade Mecum* is good for condensed work. Reynold's and Pepper's systems are for reference.

GENERAL DISEASES to be first taken up: 1st group—Morbid poisons or zymotic diseases. They have certain general characters: 1. Affect whole body, and appear to produce a morbid condition of blood, and many have following characters—run a definite course, have specific fever, characteristic eruptions, are communicable diseases, many protect against subsequent attacks, are apt to occur epidemically, depend on a specific body introduced into body from without, but some may be due to something developed in body (exceptional). They are preventable diseases. Each morbid poison has been called a germ, is specific, producing specific effects, has been called contagion or contagia, or metabolic contagia. These poisons may be divided into 3 classes: 1. True contagia. 2. Miasmatic. 3. Miasmatic contagia. Each needs definition. 1. *Contagia* is poison which multiplies only in the body. After escape from body does not undergo change (is ripe) till entered into another body, so contagia only attains full development in living body, and are excreted alive active. Are true contagious diseases. To this class belong the exanthemata, smallpox, vaccinia, scarlatina, chicken pox, etc., etc., also typhus, relapsing fever, influenza, diphtheria, mumps, whooping cough, syphilis, anthrax, tuberculosis, etc. 2. *Miasms* multiply outside the body, give disease on entering body, but are not communicable except by inocu-



lation. It is not known whether the poison is thrown off the body, malarial, intermittent fevers and (Veri veri) of China, and some include pneumonia, acute rheumatism, acute mycosis and simple mycosis. 3. *Contagious miasmatic*. These present these peculiarities, the development of the poison depends on external circumstances. The escaped poison is innocuous until it has undergone change, develops and is communicable. Here belongs typhoid, cholera (Asiatic), dysentery, yellow fever, plague and perhaps erysipelas and septicaemia, certainly cerebro-spinal fever, also anthrax. *Theories of Morbid Poisons*.—1. Are really germs of vegetable nature, microscopic, are called bacteria or microbes, multiply indefinitely. 2. Are, strictly speaking, germs (not), but are organic poisons, just as the poppy produces Morphia, but first theory is the accepted one. An old theory was the germs were really grafts implanted on body from diseased body.

ACUTE SPECIFIC FEVERS.—General are divided into essential or *idiopathic*, due to introduction of morbid poisons into body, producing specific fevers; and *symptomatic*, as following injury, are also called traumatic fever.

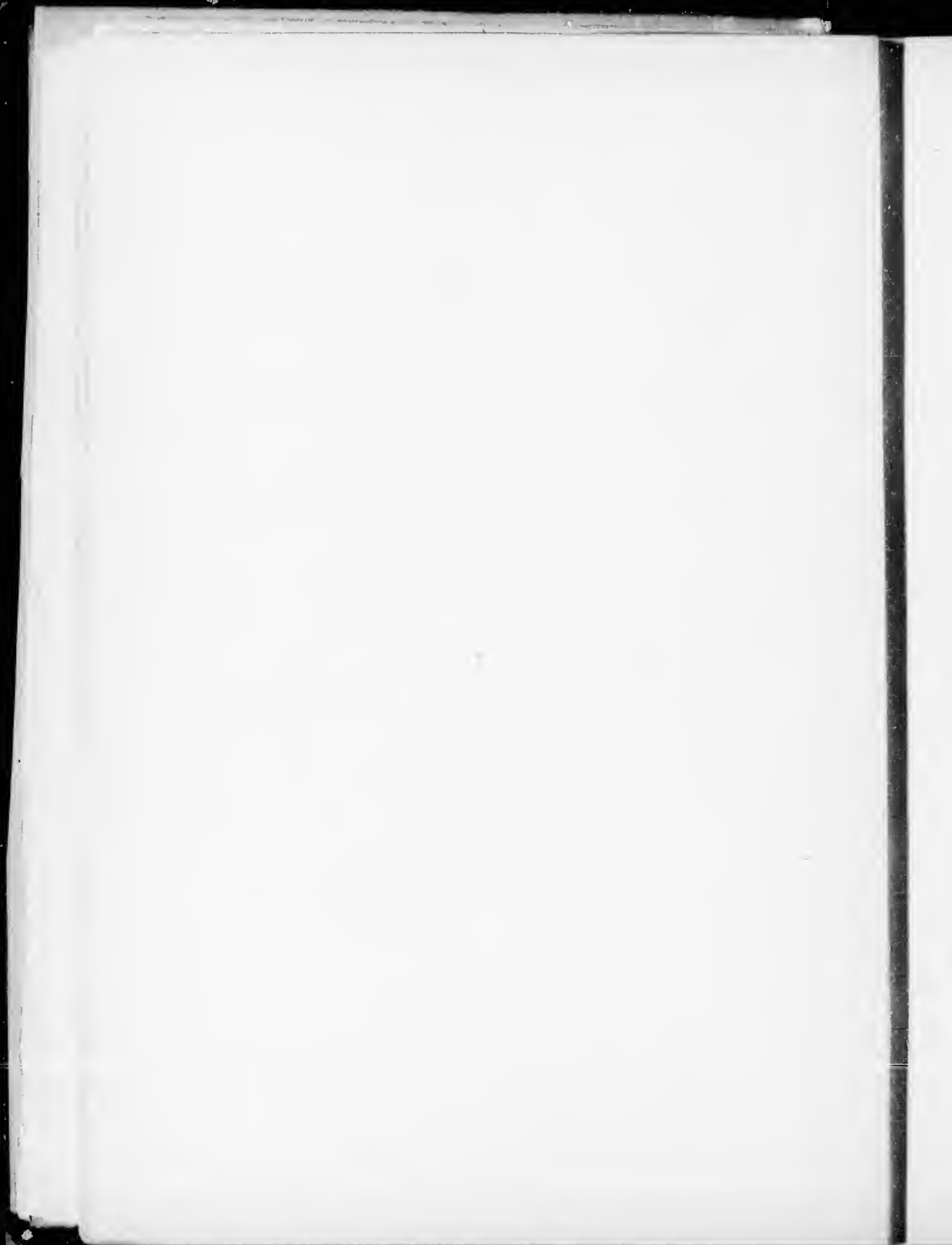
ESSENTIAL OR IDIOPATHIC FEVERS.—1st group exanthems to it belong most of the communicable fevers. This year the following will be treated: typhoid, typhus, relapsing and cerebro-spinal fevers.

TYPHOID FEVER, also called "slow fever," "Dothen enterite" (French) *enteric fever*, as in U. S. pythogenic fever (dirt begotten). History 1836 by Lombard of Geneva, it was distinguished from typhus. In 1813 it was described as enteric, mesenteric. A. R. Stewart of Glasgow 1841 described eruption, Jenner also described it. In all these fevers there are following stages:—

1. **INCUBATION** while developing. 2. **INVASION**, 1st symptom is higher temperature than normal. 3. **DEVELOPMENT** and progress. 4. **STASIS**. 5. **DECLINE**.—Incubation of typhoid varies from 1 to 2 days to 21 to 22 days; 10 to 14 days is average, period not fixed. Thus, of 14 persons at one time exposed, 8 days for 1, 12 in 3, 13 in 1, 14 in 2, 15 in 2, 16 in 2, 16 to 18 in 2, 14 to 22 in 1. One of the elements affecting incubation is temperature, high, favoring incubation. Unrecognizable idiosyncrasy of the person also affects. When imbibed (swallowed), it is thought to act quicker than when inhaled. When typhoid stools are decomposed, then it is thought inhalation is as active as swallowing.

TYPHOID.—Is: 1st *Typical*, 2nd *Atypical*. Atypical cases are usually mild, short, often non-febrile, and are called all sorts of names,—*gastric, bilious, intestinal, catarrhal, etc., infantile fever, bilious remittent fever, etc.*

TYPICAL FORM has 3 modes of invasion—2 common: 1st, by slow process of development. 2. Rapid. 3. Cases occur where invasion is sudden with symptoms of narcotic poisoning are malignant, is very rare. 1. *Slow*, patient feels out of sorts, chilly, pains in limbs, headache, pain in back, in bones, languid, appetite impaired, headache, fever and diarrhoea (diarrhoea coming on suddenly suspect typhoid), out of spirits, perhaps slight elevation of temperature, hangs about,



and finally goes to bed about the 14th day; symptoms gradually deepen into typhoid. 2. *Rapid*, or he may become suddenly sick early fever, chilliness, diarrhœa, etc., and promptly characteristic typhoid symptoms are developed.

TYPHOID SYMPTOMS.—Temperature high at night, lower in morning. First week, pains in back and limbs continue, dizziness on standing, patient is reticent, sleepy with dreams, no delirium yet, but towards end of this week may have delirium, on waking pupils dilated, flush on malar bones, pulse not frequent at first, 90 soft.

INTESTINAL TRACT.—Tongue red ground, perhaps white fur, thirst, loss of appetite, stools solid brown, or loose, no griping. Careful palpation shows spleen enlarged, belly gradually enlarges, perhaps pain on pressure in right iliac fossa, with gurgling if listened for in cæcum. Second week, character of eruption shows itself, pink spots raised, margin definite, appear in crops, remaining 3 to 4 days, found on chest, belly and back.

ERUPTION appears from 7 to 12 days, is composed of well-defined rose-colored spots, comes in successive crops varying in number, few to actually covering, each spot is about 2 lines in diameter, appear generally first at lower part of thorax and upper of abdomen, also look on back where they are present even if wanting on front. Sometimes this eruption is preceded 24 hours by a blush of surface of body. Eruption declines towards end of third week, now sudamina appear, are sweat vesicles, occur when there has been profuse perspiration. About middle of second week headache subsides and typhoid symptoms appear, he is apathetic, tongue dry, coated, cracked. Delirium comes on at first nocturnal, but by degrees both day and night. It may be mild, (2) low, muttering, or (3) wild, needing restraint. Towards end of second week abdomen is tympanitic, diarrhœa sets in (5 to 10 stools a day), but may be absent. Stools are generally fluid, drab or ochre yellow color, or commonly called peasoup stools. Large flocculi (bran stools) are observed floating about. In bad cases are dark green offensive smell, are alkaline. With a microscope, crystals of Carb. of Amm. are observable. The flocculi (bran) will be seen to be portions of mucous membrane due to breaking up of Peyer's Patches. By end of third week the nervous symptoms become more marked, ending in nervous prostration; patient lies on back, may slip to foot of bed, hardly can feed himself, may be tremulous, tongue projected (if asked for) tremblingly, urine and feces passed involuntarily. Now bubbling rales are heard over lungs, showing low form of bronchitis. This symptom may occur earlier.

CARDIAC.—Symptoms: Pulse frequent—120, dirotic feeble, heart feeble, sounds alike, feet and hands cold, skin cyanotic; patient becomes comatose, subsultus is observed. These symptoms pass into collapse and death; but even from these recovery may take place. In mild cases from 15 to 20 days recovery may take place, in severe 21 to 35. In this disease a relapse is apt to occur without care, as to business anxiety, mental exertion particularly of a very small kind, improper, solid or over-abundant food, exertion, etc. A true relapse may occur from re-absorp-

tion of the poison from the ulcerating glands of intestine and mesentery, or may be due to continuing to expose himself to the primary cause of attack. You can distinguish a true relapse by getting all the symptoms of typhoid over again, and in addition a return of the rash; this last is the important point. Relapses are more apt to occur in cases where cause of the fever has been checked by antipyretics or cold baths, drugs, etc. Convalescence is sometimes greatly protracted 2 to 3 months, with diarrhoea and hectic fever. Patients become stout rapidly after this disease, appetite good, etc.

RE TEMPERATURE.—This is typical, rises steadily every day about 1.1 degree, and there is a marked difference of about 2 degrees between a. m. and p. m. temperature. This ascent goes on 5 to 6 days to its maximum 104, 105. This is the stage of ascent. Evening temperature is higher than morning. Then there is stage of continual fever, the "stasis" or "status." In this stage variations do not vary over 1 degree. In a mild case this stage lasts a week, in other cases 2 to 3 weeks. Now remissions occur, distinct drops of temperature.

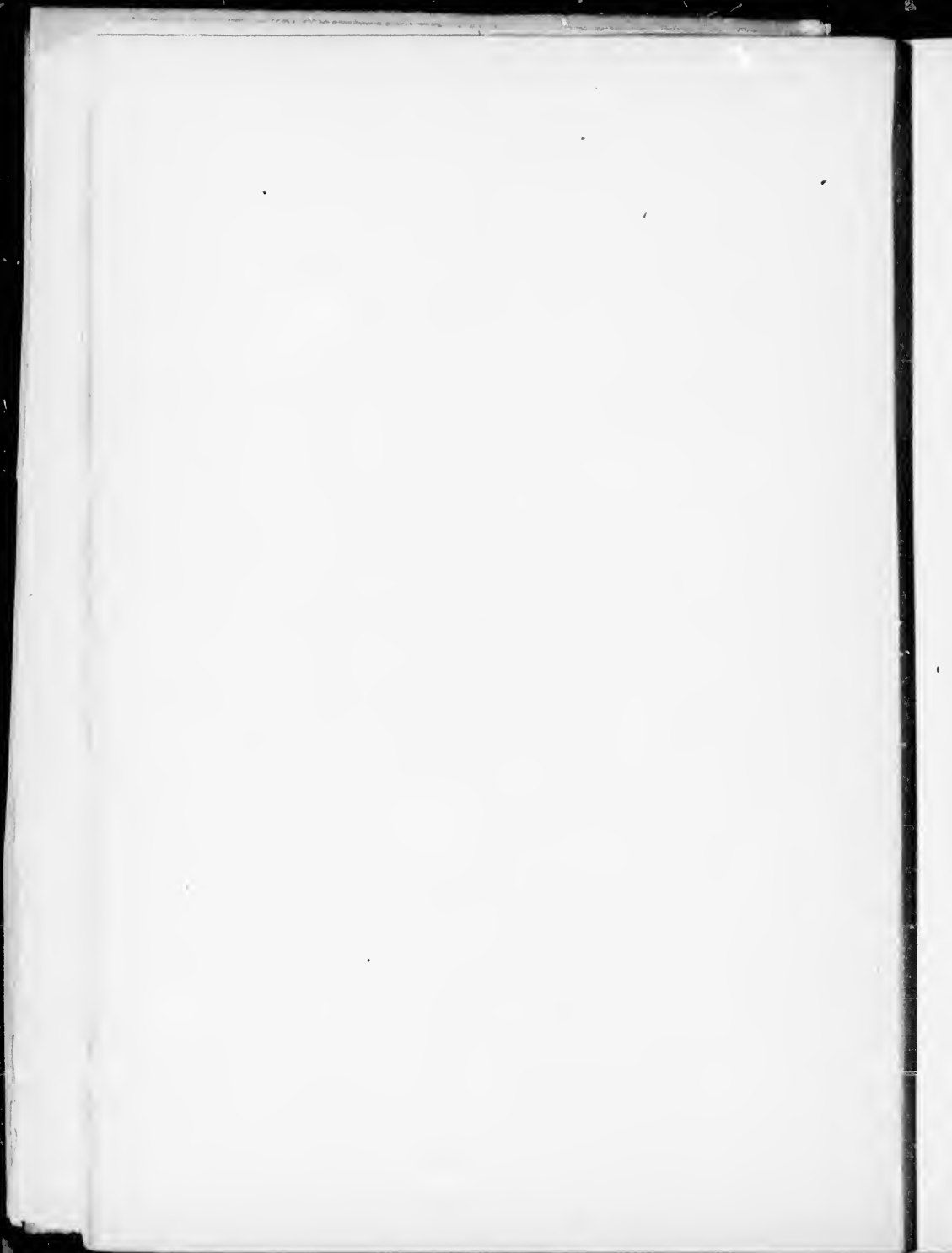
STAGE OF REMISSIONS.—May last 2 weeks; in bad cases the stage of "status" may last 2 to 3 weeks. The stage of remission now gives place to intermittent stage, a descent down to 98 or 97. Sudden alterations in temperature may be caused by hemorrhage, diarrhoea or by action of drugs. These variations are apart entirely from cause of disease.

PROGNOSIS RE TEMPERATURE.—104 is ordinarily favorable (evening temperature), even 105 is not wholly unfavorable, 106 is serious, 107 is generally fatal, and 108 is almost certainly fatal.

RE ATYPICAL TYPHOID.—1. There are cases lasting full length, mild temperature does not go over 104. 2. Mild cases not running over 3 weeks. 3. We have abortive non-maturing cases. In these, symptoms have been as severe and may be as high, and in 2 to 3 weeks fever aborts. These may be very severe at onset, first week temperature even 105, but only a fever storm, ending quickly. In these atypical cases the eruption is often absent, also the diarrhoea. The spleen may not be enlarged, but generally is.

PROGNOSIS FOR ATYPICAL.—Generally favorable, and convalescence rapid, but relapses are very frequent. In some atypical fevers a subnormal temperature may be present, that is, under 98.5. All other symptoms were typhoid, and post mortem shows lesions.

SEQUENCES OF TYPHOID.—1. Hemorrhage, slight or profuse; if the latter, it may look bright, not congealed; if scanty, it is black, coagulated, due to acid action of bowel. Source of this hemorrhage is from ulcers of intestine, most usually happens 12th to 28th day. 2. Perforation of bowel due to ulceration, may occur during convalescence. Symptoms are acute pain in bowels, constant vomiting, and marked collapse and great distention of abdomen. If this happens in the typhoid stage, then patient is too low to show pain or collapse to a great extent. This is generally fatal, death in 24 to 28 hours. There is a milder form of peritonitis, when ulceration has only reached the peritoneum without perforation.



Another cause of peritonitis is suppuration of mesenteric glands, generally fatal. 3. Tympanitic distention fatal in 50 per cent., may be caused by paralysis of muscular coats of bowels, leading to distention. May be due to loss of general nerve power. Another source is decomposition of blood, food, or sloughing mucous membrane in bowel, and gases produced. It is most apt to occur in 3rd week or 4th or 5th. 4. Catarrh of fauces, middle ear, deafness and of parotid gland, leading to abscess; but this is rare comparing to typhus. 5. Very important is the complication in lungs, a low form of bronchitis in small branches. May begin 8th day, but usually 3rd week may lead to collapse or broncho-pneumonia, occurring along with general weakness may lead to oedema or hypostatic congestion. 6. Circulatory complications, hemorrhage, thrombi, embolism. 7. Pulmonary effusions, phthisis. 8. Thrombosis of veins of lower extremities may occur after patient is about, due to weak circulation, occurs about Poupert's lig. Symptom spain along Saphenous vein. This is always recovered from, but leg is weak for a long time, periostitis (fever sores) on shin, ulna, etc., is a sequel.

THROMBOSIS of legs produces "milk leg." Thrombosis of arterics very occasionally ensues, and produces gangrene. Paralysis is also rare, due to peripheral neuritis, principally affecting ulnar nerve, due to pressure or extension. The peroneal nerve is likewise sometimes affected; sometimes both legs or arms, or one of each, or one. Cerebro-meningitis sometimes occurs, melancholia or active insanity is sometimes a sequel, immunity is not given by one attack.

LESIONS.—1. Primary, essential to this disease. 2. Secondary, other fevers have same: 1. Primary, due to the morbid poison acting on Peyer's Patches or solitary glands, of intestine, and consequent on these the mesenteric glands and spleen. It begins with catarrhal state of lower part of ileum and beginning of colon, concentrating itself finally in Peyer's Patches and solitary glands, grows or proliferates, leucocytes escape from vessels, distending follicles, infiltrates tissue and mucous structure. In extreme cases it gets through even muscular coats, and an accumulation of these cells is found on the peritoneum. Peyer's Patches are congested, swollen, encircled by red ring, are of size of pin-heads, but progressively increase in size and prominence, are in color semi-transparent and greyish white with red zone of increased vascularity. On incision they resemble fetal brain,—white with red lines. Their size is now like large shot or peas. So far case is curable. But now these may undergo fatty degeneration and absorption, favorable, or they may slough, owing to growth of young cells cutting off blood supply by their crowding. Color of slough varies, may be greenish yellow (bile or blood-stained), or may be yellow or ochre color (bile-stained alone). The ulcers are not evident in Peyer's Patches, here are irregularly placed, with undestroyed tissue, between which may slough, also finally seen in solitary glands. A typhoid ulcer is characteristic, they affect only Peyer's Patches (oval) and solitary glands, with long diameter of bowel corresponding, and are opposite to mesentery, the edges project 1 to 2 lines, a clean base to ulcer, ulcers



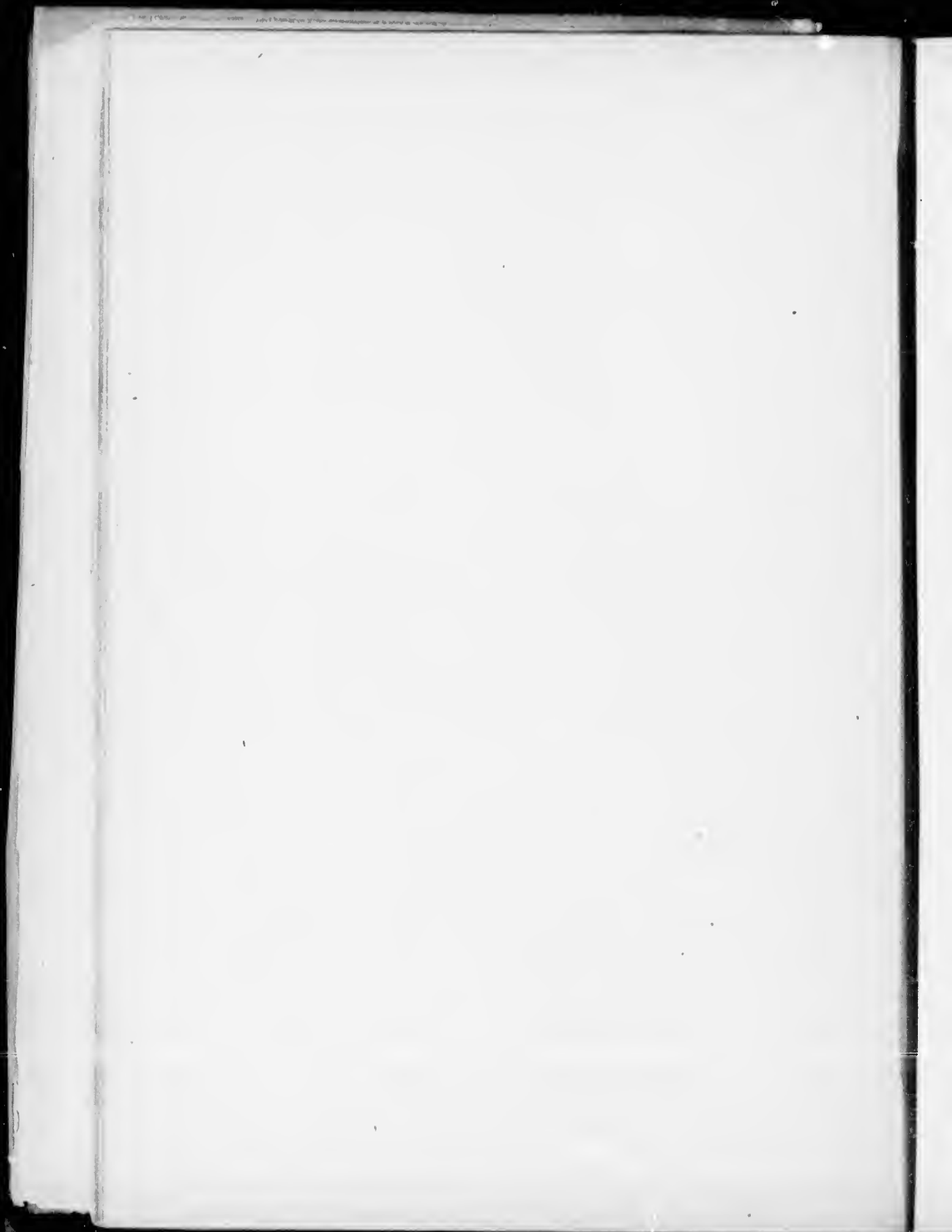
get more numerous nearer to cæcum, near where perforation occurs. A typhoid ulcer cicatrizes without contracting lumen of bowel. The perforation is always small, size of silver probe, with evidences of peritonitis locally. The typhoid poison secondarily attacks mesenteric glands absorbed from ulcers of bowels. These glands enlarge: (1) may soften and be absorbed, fatty degeneration; or (2) rarely may suppurate leading to general peritonitis; or (3) caseous degeneration of gland may result and chalky material remain. The spleen enlarges in typhoid through hyperplasia, softens, is congested, etc. An expert at 4 to 5 days by percussion can detect enlargement. Its size reduces by softening and absorption.

2. Secondary changes not essential. These may occur in all fevers, resulting really from impaired nutrition. These same symptoms are met with in anemia and starvation proving above, they are present, higher, the fever, and longer it lasts, also proving above, but may be present in simpler cases. It is termed parenchymatous degeneration, cells become cloudy, swell and gradually form distinct granules due to escape of albumen from circulation, this finally passes into fatty degeneration, this degeneration affects or may affect all organs of body, principally liver cells, kidney cells (tubules), heart, all voluntary muscles, then pancreas and all the rest. Naked eye alterations are: organs are dull and cloudy and of greyish look; usually are softer, have a boiled appearance, organs are found doughy, anæmic. These occur notably in typhoid, scarlet fever, small-pox diphtheria, etc., etc. Heart is softer, more friable, color altered (grey or greyish, yellow or red brown), but under microscope the striation of its muscle cells is lost, and in place you see granules, protean at first, fatty in advanced stage; waxy degenerations are found in muscles, resemble fish flesh, are very friable, especially affects muscles most used as adductors, pectoral, recti, diaphragm, tongue. Blood vessels also undergo fatty degeneration, blood itself degenerates, red cells undergoing fatty changes, solitary glands thus suffer, the brain also suffers parenchymatous change, shewn by sometimes a weak brain after this fever.

GROSS CHANGES.—When death ensues in any of these fevers, congestion of pia mater and brain substance takes place with serous effusions into ventricles and membranes.

CAUSATION of typhoid, no morbid poison received into body necessarily sets up disease, must have proper soil, called predisposing causes. 1. Age, may occur at all ages, generally between 15 to 25, or 52 per cent., 20 per cent. occurs under 15 years and same after 25 to 35, rare after 35 years. It is usually an endemic disease, localized, so is due to local causes, most apt to occur after dry and hot summers, but many exceptions at present year. It is called "autumnal fever," because it prevails especially in Sept., Oct. and Nov. Overcrowding, fatigue, intemperance, etc., have far less influence in typhoid than in typhus, but still do favor its propagation. Recent residence in an infected locality predisposes.

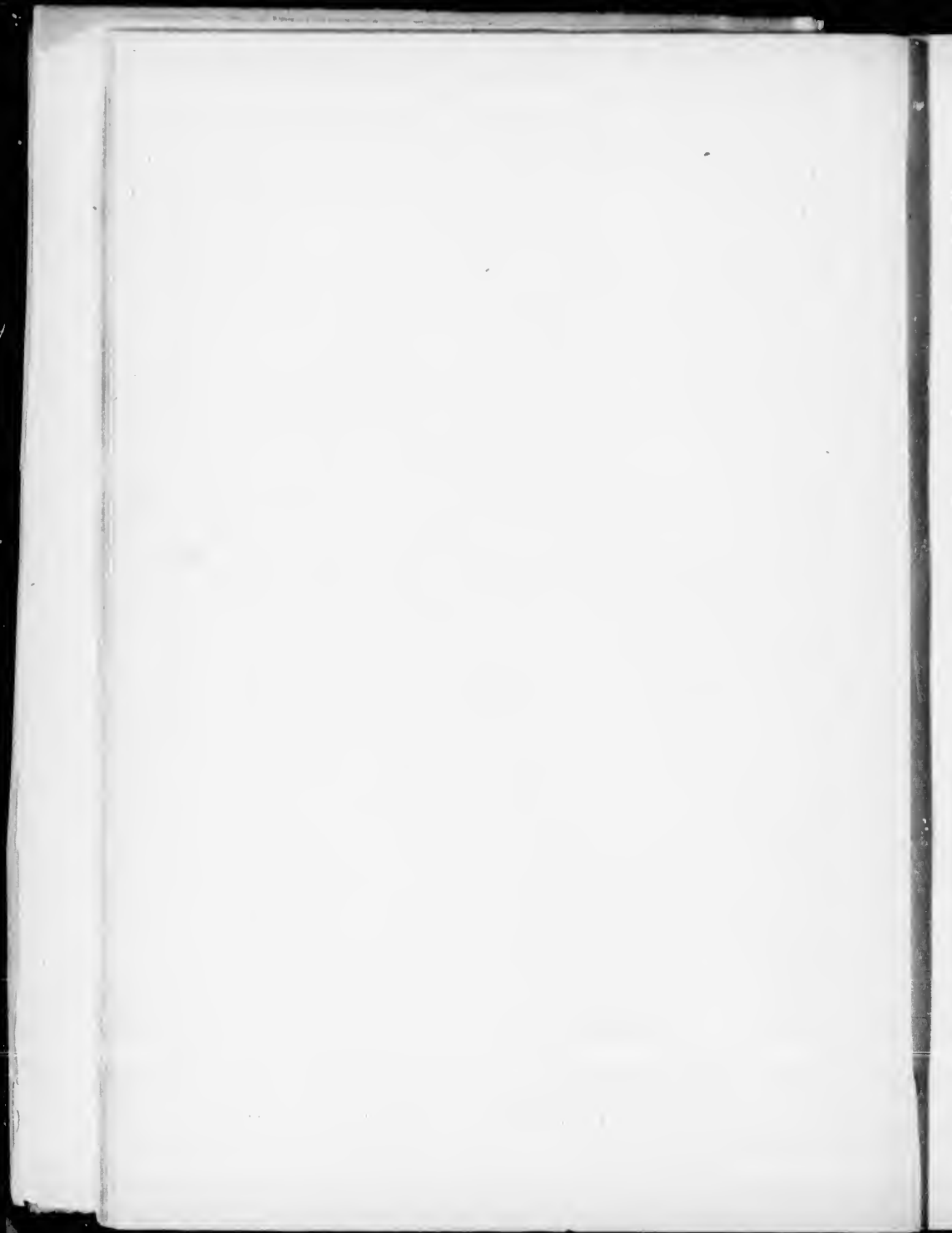
THIS FEVER depends on a specific poison originating in a previous case. Its sources are: 1. Drinking water, commonest, through sewerage contaminated by



typhoid stools. 2. Air, volatile matter from typhoid stools. 3. Milk supply, how? Impure water used to wash milk vessels, or the watering of milk dishonestly. It is probable that milk in proximity to typhoid influences will inhibit the poison. 4. Persons recovering from the disease should not be allowed to milk cows, as desquamated cuticle may get into milk. 5. Cows themselves may suffer from typhoid fever, and so is milk poisoned; eating this flesh may give typhoid. 6. A field manured, in which manure typhoid stools are present, may contaminate a cow there grazing, clinging to the hairs, etc. 7. Dilution does not lessen the potency of the poison. 8. The poison retains its potency for a long time, a case is known for 2 years; some think the germs may propagate in the soil. Typhoid fever is a communicable disease chiefly through stools, but some change is necessary in stools (decomposition) before it is communicable, but it is thought that now and then the fresh poison may communicate the disease. The rule is a nurse attending does not take the disease, but there are exceptions where it seems to be directly communicable. The time elapsing before stools are infectious is thought to be 12 to 14 hours, but there are exceptions. Certain morbid poisons passing through a body acquire increased virulence, probably true of typhoid, so it is thought sometimes one may take the disease from the fresh stools. Foregoing is accepted theory. Murchison says it may originate *de novo*, but science does not accept it *omne vivum ex ovo*. Any way given, the poison needs a proper *nidus* in which to increase. 1. Decomposing animal and vegetable matter, fecal matter and sewerage, the latter especially, chemically pure water will not sustain life of typhoid. Some (Carpenter) think water rich in lime favors propagation. "Pettenkofer" thought a scanty supply of surface water was the condition favorable through concentration. 2. Temperature, a certain definite range. 3. Moisture, a certain degree of. 4. Peculiarities in the individual, hence we must endeavor to destroy the germs, prevent the admixture of the poison with water and milk, keep it out of water-closets and sewers, flush thoroughly, have a good trap to sewer outside of house. The sewers should be ventilated into the general atmosphere by means of a high tower at highest point of such drain or each drain.

SEVERAL DIFFERENT GERMS have been described as the typhoid germ, but scientists agree with Koch's bacillus, is rod shaped, 2 to 4 lines in length and one-third as thick, active and mobile, have been found in the blood, albumen, urine, excreta; after death it has been found in mesenteric glands, spleen, etc. So far this bacillus has failed to give the fever to lower animals, so the bacillus is really not yet proved.

DIAGNOSIS OF TYPHOID.—General observations: 1. Re-atypical, mild or short, severe, you should remember they are simulated by gastric catarrh, symptoms of cold, indigestion, but careful palpitation will in nearly all cases of typhoid shew some enlargement of the spleen. 1. This enlargement of the spleen in acute febrile disease suggests blood-poisoning and typhoid in particular. 3. The more spots, with fever and splenic enlargement, show typhoid. 4. Or without



rose spots the spleen enlargement along with the typical variations of temperature give typhoid. 5. If similar cases, especially if typhoid be prevailing, the diagnosis is more certain. 6. Fever associated with splenic enlargement, headache and diarrhoea points to typhoid, but typhus fever resembles typhoid to some extent, to be presently described. It is extremely difficult to diagnose acute tuberculous from typhoid. Will be treated of under phthisis.

II. TYPHUS.

PREDISPOSING CAUSES OF TYPHUS.—1. All conditions which lower the vitality, as *hunger*, cold, thirst, mental and bodily fatigue, anxiety, any existing disease which lowers the vital powers. General debility from past disease. 2. Overcrowding, as houses too closely packed together, or overcrowding a house by people. 3. Defective ventilation. 4. Personal uncleanness. 5. Intemperance. 6. Age, 20 to 40 is commonest period, but may occur at all ages. 7. Season, especially in cold months, perhaps through overcrowding, ill ventilation, etc. 8. It is epidemic, extremely so, as in 1847.

EXCITING CAUSES OF TYPHUS.—Various theories, Marchison and another believed in spontaneous origin of typhus through overcrowding, but above not accepted. The accepted theory is: due to a specific germ from antecedent; is propagated directly from patient, through emanations from lungs, skin, etc. It can also be taken from dead body. It is doubtful whether typhus germs are in stools or not, but take precautions as if they were. Actual contact not necessary. A well ventilated ward renders danger less. Germs are lighter than air, hence rise to upper rooms. Dark colored and woollen clothing are said to carry the germs—probably true. Typhus cases should be isolated. A few minutes' exposure to the influence of disease may be sufficient to contract it. It is thought emanations to end of first week are innocent. Typhus gives immunity after first attack. It has no morbid appearances in *post mortem* beyond passive congestion and its consequences, as cedema, infarctions, etc., but the parenchymatous and fatty changes as described in typhoid, and due to impaired nutrition, may be found in all the organs. The brain is especially apt to have congestion and cedema of substance and membranes seen during the disease is tendency to coma. The blood is black and tarry, due to destruction of red cells. Lungs may be bronchitic—hypostatic. Congestion may be so great as to make lungs splenic.

PLEURA may be congested.

INTESTINES shew no lesions, only perhaps patches of congestion, and this would affect the dependent parts only, due to passive congestion. Peyer's Patches and mesenteric glands are not affected. Spleen undergoes enlargement and softening as in typhoid. The spleen is best test of an infectious fever, for all affect it. Infarcts may also be found, due to spots of congestion. *Liver* is merely congested. *Kidneys* may suffer a little more than in typhoid.



TYPHOID.

Invasion slowly, rigor not so remarked.

Temperature, rise 1.1 degree difference for 5 days.

Oscillations of temperature in 3rd to 4th week. Decline gradual or by lysis.

Eruption, spots 6 to 11 days, that is, in 2nd week; consists of scattered spots, rose colored well-defined edges raised above surface, fade on pressure, and last only 3 to 4 days, giving place to others.

Spots are few, come in crops.

Countenance, etc., bright red, flush pink, pupils dilated, intellect is brighter, and delirium comes on not till end of 2nd week, and is usually more active.

Tongue thick, large and flat, dry but not as dry as in typhus, but may be moist throughout the whole course.

Stools fluid generally. Sloughs floeculi, tenderness and gurgling in right iliac region.

Symptoms generally are abdominal. Tympanites.

Temperature mounts in steps, regular variations and gradual fall. Sequences—diarrhoea, hemorrhage and perforation are common.

Suppuration, bedsores, etc., are rare in typhoid.

Duration 3 to 4 weeks, but is indefinite, may last 2 to 3 months.

TYPHUS.

Invasion abrupt, headache, chilliness, or distinct rigor.

A sudden rise, rush even to 104° 1st day.

Oscillations do not occur at all in typhus. It ends by crisis and sudden drop, usually attended by an evacuation, as sweating, flow of urine, diarrhoea.

Appears 1st week, 4th to 6th day; is dark red color, outline fades off, are but slightly raised. Each spot in couple of days darkens; a spot appears in centre forming a petechia. At first, spot disappears on pressure, but petechia does not disappear. May be very numerous. There also seems to be a subcuticle rash.

Spots are numerous, and soon are present in full force. Petechia after death do not disappear.

Eyes injected, pupils contracted, countenance dark, dusky, is dull and stupid, and delirium is low and muttering, and appears in 1st week.

Thick, contracted, pointed, dry, covered with sordes, never moist throughout. Breath bad.

Stools consistence of mud, no signs of sloughing, both tenderness and gurgling absent.

Symptoms sometimes are cerebral.

Yes.

High, according to severity of case; steady with sudden fall after crisis. These symptoms are rare in typhus.

Suppuration of parotid glands, sores on sacrum, on exposed parts due to low state of nutrition.

Shortest duration 3 weeks, often over in 2.

Convalescence may have true relapses or returns of slight fever.	Is permanent, no relapse, for one attack protects against future attacks. About 15th to 20th day.
Death, generally 3rd to 4th week, or later.	Usually 2nd week or 3rd.
Lesions well known.	None characteristic.
Endemic.	Epidemic.
Indirectly contagious.	Directly contagious.
Disease, not peculiar to any class.	Disease of the poor through overcrowding, ill feeding.
Age, 15 to 25 greatest liability.	20 to 40 greatest liability.
Not very infectious.	Is very infectious.

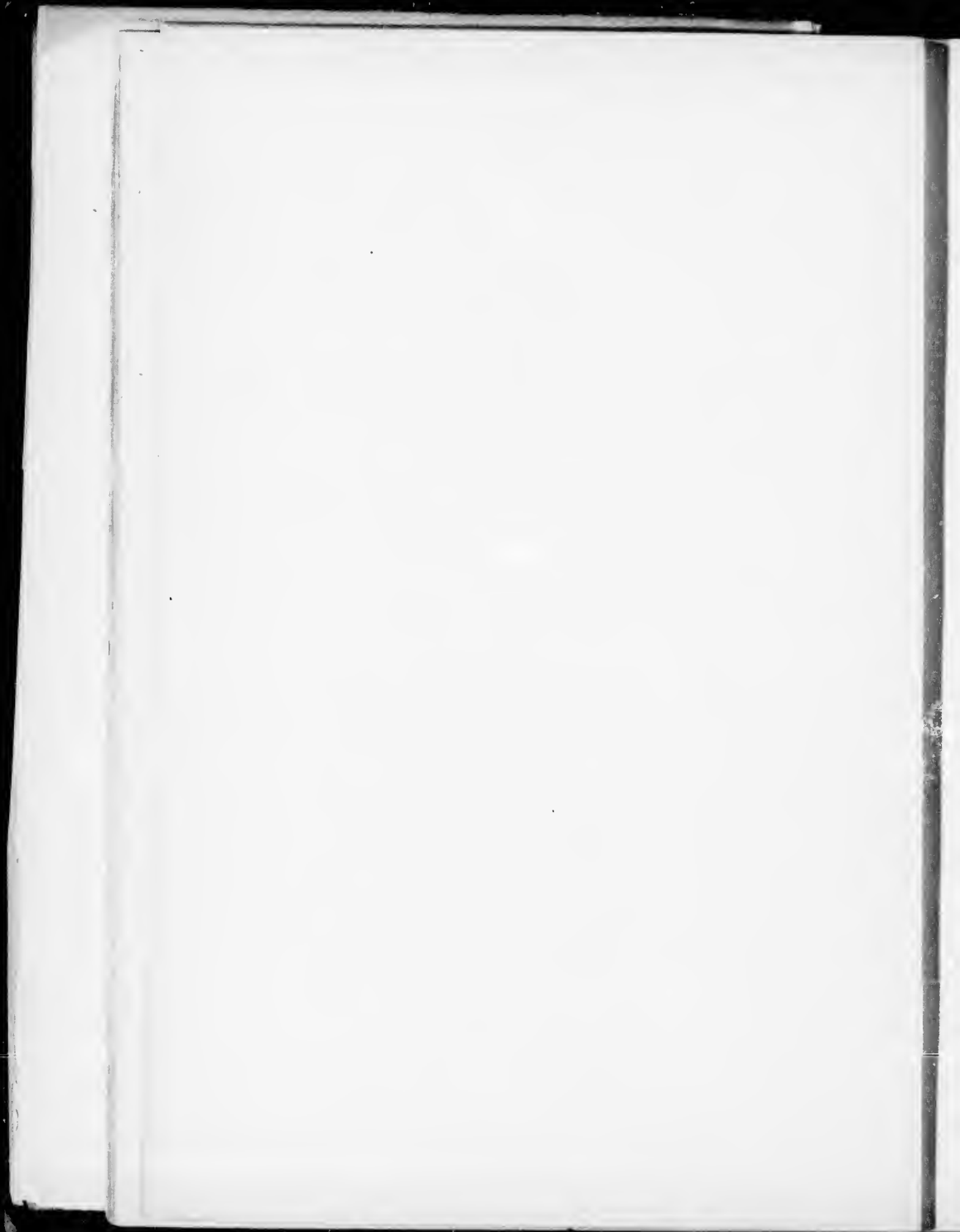
TREATMENT OF FEVERS.—These fevers cannot be aborted, they must run their course. We can only guide it to a successful issue by supporting the vital power from the beginning. 2. Also by moderating the reaction of the system under action of the poison. 3. Also by averting and controlling the constipation.

Treatment is mainly : 1. Dietetic, 2. Hygienic. The fevers maintain by consuming the tissue, especially muscular and blood, and there is usually an impairment of appetite and digestive powers hindering a supply to take place of the waste.

FOOD ALLOWED.—So allow patient light food, as gruel, bread and butter, an egg, cornstarch,—these only in first stage. But after a more advanced stage the digestive system cannot handle solids, so milk is the great food,—the entire food. Give milk 2 to 3 ounces every two hours. If it disagrees give lime water with it, or the B. P. Sacch. Sol. of Lime water gtt, 15 to 20. Various forms of animal broth—beef, mutton, chicken, etc., give every two hours. It improves them to add some starchy matter, as oatmeal, barley, cornstarch. Milk is much improved by addition of white of egg 2 to 3 times in twenty-four hours. It is a mistake to give over 3 to 4 pints per day, as casein accumulates, irritates, and causes flatulence, pain and perhaps diarrhoea. A pint of good milk equals a mutton chop. If you should suspect milk, boil it. Food should be given every two hours, both night and day,—may be peptonized if necessary.

DRINK.—Cold water is best, can be given freely ; boil it if suspected. Whey is also good drink, also butter-milk, tamarac tea, black currant tea. A few drops of mineral acid lemonade in water,—not to be used with milk diet.

HYGIENIC.—In all fevers put patient early to bed. This is to preserve strength. This is very important, as proved by statistics. Select large, well ventilated room, have open window, or else fireplace. Place bed in centre,—bed narrow so that nurse can get to patient. Avoid blankets as a rule, do not try to retain heat, but use sheets to take away heat. Personal cleanliness is important, use tepid water. Every day face, neck and hands should be washed with cool or tepid water, add vinegar. Change personal and bed linen often. Temperature



of room should not be lower than 56, about 60 is right. Wash mouth twice a day with water, or water and borax. Provide a nurse,—a trained one preferred. Patient should not be left. Have patient (especially in typhoid) early trained to use bed-pau, and receive both urine and feces into a disinfecting fluid, and with all infectious fevers do not allow feces to be put into water closet, but bury in hole in garden,—you owe this to society. Never let a patient out of bed, especially in advanced stage, under any circumstances. In convalescence do not let patient get up for a week after the evening temperature has remained normal for that time. Tell him he will recover sooner by doing this. Under this hygienic treatment ordinary average cases will do well without medicine, unless complicated by hemorrhage, diarrhoea, insomnia, etc. But at present medicines are given, first, to lower temperature, antipyretics; and second, antizymotics, to kill germ, hence a high temperature 106° even for a short time is dangerous, also a temperature 102.5 for a long time is dangerous. Formerly the antipyretics were 15 to 20 mins. of any of mineral acids, as Muratic in water every two hours, also Liquid Amm. Acet. Spts. of Ether Nitrosi were used, also Carbolic Acid, Salicylic Acid and Iodine were given for germeides.

Dr. Howard's formula for fever is R. Salicyl. of Soda grs. 15 to 20, Spts. of Chloroform mins. 15, Tinct. Card Co. mins 15, Syr. $\frac{1}{4}$ oz., Aqua a little—every 4 hours. Antipyretic.

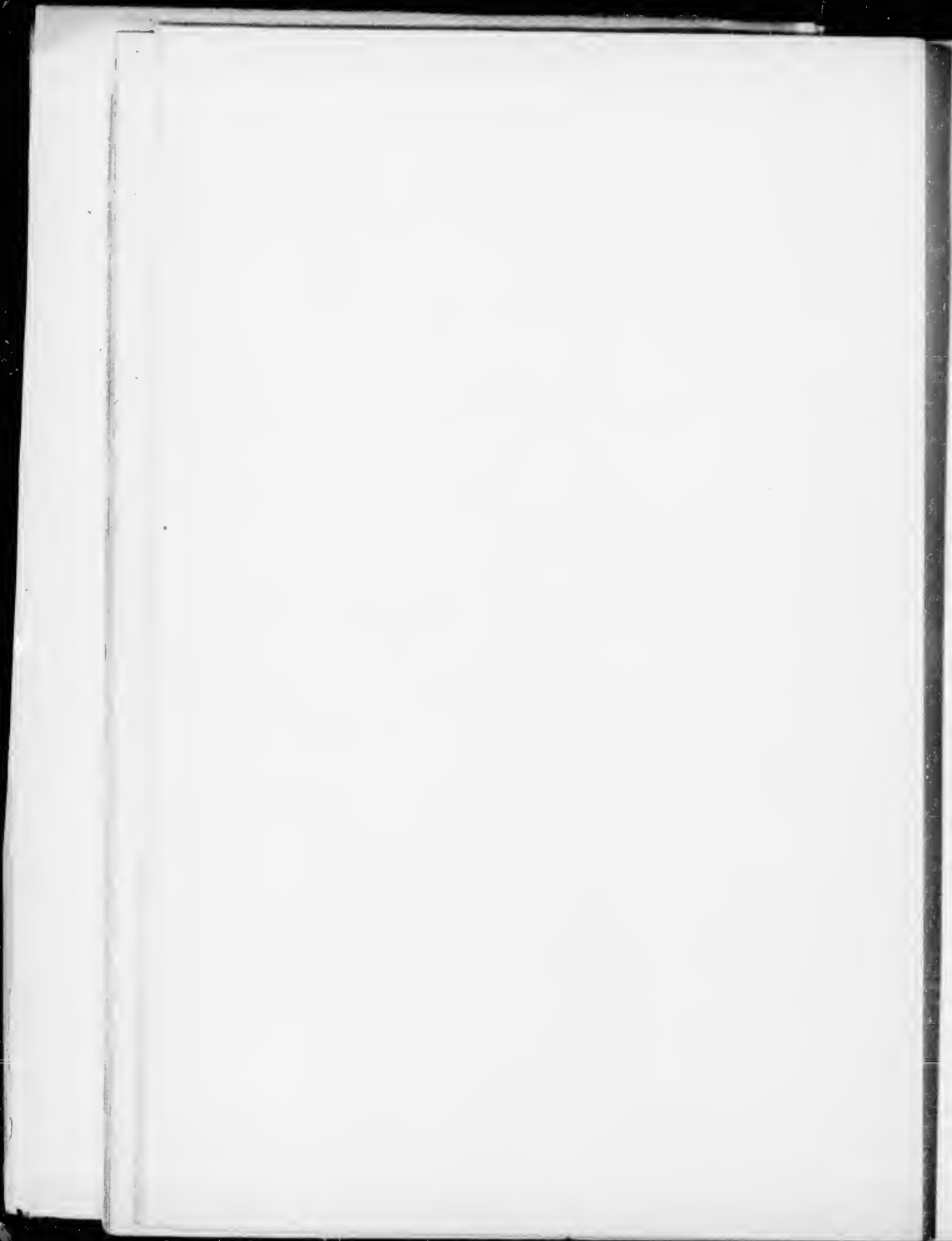
In advanced stages do not use the above, but in the first two weeks it is a good antipyretic. Another good one is R. Tinct. Iodi. mins. 2 to 3, Acid Carbolic mins. 1 to 2, Syr. Limonis dr. $\frac{1}{2}$ —to be taken in water.

In great majority of typhoid cases the above prescriptions given in moderate and repeated doses are all that is required, especially if the body be sponged 3 to 4 times per day.

SPONGING.—Sponging is a good antipyretic, is also very soothing, followed often by sleep; used when temperature is high as often as every two hours above 105°.

A reaction has set in against antipyretics. It was said the parenchymatous degeneration set in on account of the high temperature, but now it is thought to be caused by mal-nutrition, so heat is now not considered so dangerous.

Heat is but a symptom of the disease, is beneficial, is of a compensating nature, and the reaction of the temperature does not shorten the fever 1 day. Temperature of 102 to 102.5 does not require any antipyretic treatment, unless too long. Importance of high temperature. A high temperature of 106 in typhus or relapsing fever is not as serious as a high temperature in typhoid or acute rheumatism. A rapid rise of temperature is especially of grave importance. In rheumatism a sudden rise to 109, patient died in two hours. Case for antipyretics. In typhoid when temperature exceeds 104, and especially when it rises rapidly, and no remissions, morning and evening temperature is nearly alike, we then resort to antipyretics.



ACTION OF ANTIPYRETICS.—1. May abstract heat, as by ice or cold water. 2. By lessening production of heat. 3. By promoting discharge of heat. Agency of cold: most prompt way in fever to reduce fever is cold bath of 64° to 70°; wrap patient in blanket, put him in 10 to 15 minutes till he shivers.

This will have reduced fever say three degrees, lasting quite a while. This method is useful for strong robust patients in the early period of the disease.

GRADUATED BATH.—In less strong patients, or children, or more advanced cases, use the graduated bath. Put patient in water 100 degrees, the lowest temperature, then add ice gradually till the temperature of the bath is 80 degrees.

A cold sheet is also used, especially when the temperature is persistent and not too high. Dip the sheet in tepid water and wrap about patient. Take a second sheet and wring out of cold water and wrap about him. Patient lies on macintosh tossed about him; change outside sheet as it gets warmer.

Another way is to put patient on canvas camp bed, and pour water from the pitcher a little below his temperature. It runs over him through the canvas, and if bed is inclined will run off at foot into pail. Begin with water at 96 degrees. Then add ice along the bed, and is convenient.

Another way is to cover patient with a sheet, and rub over with ice. Another way is with tube cap formed with rubber tubing. Have pail of water high above the bed, siphon action will empty it. Cap can be adapted to head, abdomen, etc. Ice cap is also used.

PRECAUTIONS.—When you resort to cold baths you need to take certain precautions. If there be much weariness, give a stimulant before bathing—as wine, brandy, quinine. If temperature falls rapidly, remove at 103 degrees; but if slow keep to 101. Do not keep in bath till normal temperature is reached, as the temperature keeps going down after and collapse may occur. The lower temperature is not permanent, so bath may need repetition to 2 to 6 times per day. Time to use the cold bath is first to second week. In advanced stage employ tepid bath. When there is great prostration and later the time of fever, the warmer should be the water. But after 2 to 3 baths the temperature is more satisfactory, heart action is better, you can continue; but if no improvement takes place, do not continue.

INDICATIONS FOR COLD BATH.—If temperature over 105 degrees, the sleep be not good, 2 to 3 days without it, give bath. When temperature has no remissions a tepid bath is indicated.

Even presence of bronchitis, pneumonia, menstruation will not contraindicate it, if temperature demands it. In pregnancy cold bath is demanded.

CONTRA INDICATIONS.—Cold external surface, a weak heart, or, perforations of bowels with last cold bath will force hemorrhage.

The German school alone recommends general use of cold in treatment of fevers. It is not adopted in general hospital practice. Dr. Colly does not accept it. Dr. Cailey does accept it. Broadbent and Orr advise the use of cold water treatment in typhoid fever. Brand of Stellan, its originator, says of the cold

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water treatment, that in German military hospitals deaths were 15 per cent. before the system was introduced and only 9 per cent. afterwards. Brand uses cold baths regularly every day when temperature exceeds 102. He says it prevents disturbance of the brain, heart, kidneys and skin, prevents catarrh of the stomach and bowels, so food can be given; it arrests the bowel lesions and prevents ulcerations. It also prevents complications if so treated from the beginning of the disease, in lessening them if started later in the disease.

ANTIPYRETIC MEDICINE.—Besides the use of cold water we use medicine: Quinine in grs. 20 to 30 to 40, given at night, acts; given at bed time, takes till morning to act. If 20 grs. does not reduce 3 deg., give 30. If stomach will not retain, give enema in milk. Grains 20 to 15 and 10 of Salicylate of Soda will have great effect. Re Antipyrine and Antifebrine. To give Antipyrine give $\frac{1}{2}$ dram every 3 hours for 3 doses, or give 15 grs. hourly for 3 to 4 hours. It sometimes leads to sweating, so give Atropine or Agaricine, Antifebrin grs. 4 to 15,— $7\frac{1}{2}$ is the average—give in water, wine, etc., maximum dose is 20 grs. It acts promptly, is very rarely followed by collapse; use those last two. One important thing to watch in all diseases is the mode of death. One is asthenia, 1st, proper feeding is one way to overcome this; 2, another is keeping down the temperature; and 3, is administration of stimulants. Stimulants are indicated by dicrotic pulse, rapid pulse, *i. e.* over 120. Fever heart sounds. Coldness of extremities. High temperature associated by tremor, restlessness, sleeplessness, etc. Dry tongue is an early evidence of debility. Congestion of lungs and fever indicates weak circulation. Alcohol is the most important of stimulants, is never given at the onset of fevers. Keep off weakness, but only at end in exhaustion. Many cases never require it, as in children, adults and generally old people. In urgent cases alcohol is really called for. In dosing, better err on side of plenty than too little, but from 6 to 8 oz. of brandy or whiskey, 6 to 12 oz. of sherry or port, or 1 pint of champagne in adults, in urgent cases, per day. Push till the effect is: pulse becoming stronger and fuller, temperature abated, skin moist, etc. If Alcohol is not doing duty, try Camphor or Musk, inject Ether 1 dr. to $\frac{1}{2}$ oz. Often $1\frac{1}{2}$ pints of brandy can be taken, and no signs of intoxication, not even smelling breath.

CONCERNING NERVOUS TROUBLE.—Coma, insomnia, etc., are due to impaired nutrition of brain, although the morbid poison has some effect. But anæmia or passive congestion effects alike. Treatment is to keep down the temperature by antipyretics; give proper food; look after circulation; give tepid baths, sponge frequently. If coma threatens to be severe, employ ice cap or a cold water douche. For restlessness nothing is better than a tepid bath at bed time, or frequent sponging, or inject Morphia, or give Chloral grs. 20, Chloral grs. 5, with Bromide grs. 20.

CONGESTION OF LUNGS, or low bronchitis. This is best met by feeding and stimulant, for it is due to weak circulation. Again avoid hypostatic congestion by changing position, back to side, etc., every 4 hours. Encourage to

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take deep inspirations, to cough. Give Amm. Carb. and Ipecac as stimulant, expectorant, or give a good emetic, this last is to get rid of accumulated mucous; or give Apomorphine gr. $\frac{1}{16}$ th hypodermically. But maintain heart. In typhoid, diarrhoea is a complication. If 3 or 4 stools per day, do not interfere, add Lime water to milk,—1 part to 3 will generally keep bowels in check. If the above does not act, give Laudanum gtt. 2 to 3 every 4 hours. It may be obstinate, give Lead and Opium Pill or Pulv. Kino Co. gr. 3. Improper food may be reason for diarrhoea, too much starch or animal broth. If stools are very offensive, give animal food 2 to 3 times a day.

CONSTIPATION.—Do not allow it to exist, give soap enemata of pint $\frac{1}{2}$ to 1 in warm water.

TYMPANITES is dangerous: 1, food may cause it; 2, may be evidence of great prostration; 3, irritating medicine may be the cause.

To CHECK IT, apply Turpentine stupes and abdominal bandages, and give by mouth Turpentine mins. 10 to 15 every 2 to 3 hours in milk, or give enemata Turpentine, barley water and gruel, or insert rectal tube to allow escape of gas. Stimulants are generally indicated, and should be used.

HEMORRHAGE if slight is insignificant, if profuse may lead to collapse. Secure rest by absolute quiet, and give Opium. Use ice on abdomen, or use styptics, perhaps Ergot is best by mouth, or Ergotine injected hypodermically. If very profuse, give large enemata of ice cold water. Lead Acetate or Gallie Acid are both used by mouth.

PERFORATION OF BOWEL.—Generally fatal through peritonitis: 1. Inject large doses of Morphia to prevent peritonsis of bowel. 2. Starvation; if some food is needed, give peptonized milk by rectum. Modern surgery would perform abdominal sections.

BEDSORES.—A well nursed patient should never have any; bed clothes should always be dry. If red spot appears, wash with alcohol, etc; arrange pillows so as to take weight off such point. A water bed may be used. If skin gets broken, use Ung. Zinc or Ung. Borac. Acid. If sloughs form, Germans would put in warm water bath. Re other fevers.

III. RELAPSING FEVER.

Also called spirilla fever, has been called bilious, remittent, mild yellow fever, miliary fever, famine fever. In 1847 was last visitation in Canada.

INCUBATION.—Average 2 to 5 days. This poison can be inoculated, and takes above. But extremes are 2 to 14 days. Sets in suddenly with extreme rigor and headache and high temperature, 104 to 108 $\frac{1}{2}$ within 24 hrs. Other symptoms are pains in bones and limbs, lassitude, vomiting of biliary matter. Rigors. Surface is pungently hot. Patient is sleepless. Tongue is thickly furred on red ground, thirst, there may be black vomiting from bleeding of stomach, pain on second day in region of epigastrium and liver and spleen. Spleen and liver both enlarged. Pains in muscles and joints resemble rheumatism.

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PULSE.—120 to 140, but neither high temperature nor high pulse in danger.

DELIRIUM.—Is not generally present in first attack, but may occur just before the crisis. After 5 to 7 days a crisis is reached, ushered in by sweating or diarrhoea, and in a few hours patient may feel well. The first 7 to 8 days are followed by remission, but fever recurs at 15th day, with more symptoms of jaundice and vomiting than in the first attack. In 4 to 5 days crisis is again reached. On 21st day a second relapse occurs, and more may occur; but oftener relapses occur, the more serious is the danger.

ABORTIVE CASES may occur through perhaps resistance of patient, small doses of poison, etc. These cases terminate perhaps after first attack which was light, or after second attack, and both light. There is also a malignant variety. This is also called bilious typhoid, but not typhoid, and is due to a spirillum. Difference from typical form is that all the symptoms are more severe. Jaundice present, vomiting more severe, diarrhoea, retention of urine, hemorrhage, etc. These symptoms may not occur in first attack. Again, the remission may not be a true cessation, only a less febrile state. It terminates by crisis or collapse. Is very fatal. There is no characteristic eruption, but on third day there is an obscure mottling of the skin, lasting 2 to 3 days, ending in desquamation.

COMPLICATIONS.—(A) Besides this mottling there may be hemorrhages: 1. Minute under the skin, petechia; 2, from mucous surfaces, bladder, stomach, etc., indicates scorbutic state of blood from low diet. These are serious symptoms.

(B) Post febrile ophthalmia, often ending in blindness, usually blinding only one eye.

(C) Pregnant women always abort, woman recovers.

(D) May be sudden death from syncope occurring after crisis, patient dies in 24 hours.

(E) *Albuminuria*, urine may be reduced in amount, and sometimes suppressed.

(F) These account for *convulsions* of uræmic origin.

(G) **COMPLICATION** common with other fevers. Bronchitis, pneumonia, bubo of parotid, local paralysis.

(H) After defervescence, sometimes febrile symptoms remain, and spleen remains enlarged and may suppurate.

MORBID LESIONS.—There is no special lesion with relapsing fever, but a group of them is characteristic. 1. Spleen greatly enlarged, cells also multiplied in number, infarctions of yellowish color in veins, and is very common. In vessels of spleen the blood cells shew change. 2. *Liver* is also enlarged, due to fatty parenchymatous degeneration. 3. *Heart* ditto. 4. *Bones* exhibit a proliferation and subsequent degeneration of the lymphoid cells in marrow, and the little vessels of the bones shew fatty degeneration. Occasionally puriform supuration of medulla. 5. *Blood*, increase of white cells, presence of large granular fatty cells; similar cells are also found in splenic and portal blood; also

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large, granular nucleated cells are also found in blood. 6. There is no disease in the intestinal tract, no inflammation or ulceration.

ÆTIOLOGY.—1. One powerful predisposing cause is, namely, destitution or starvation (famine fever). 2. Is highly contagious. 3. Overcrowding greatly favors propagation. 4. Some think germs propagate in stagnant water. 5. Exciting cause is a spirillum, specific, its habitat is not known, is introduced by air or food, is inocuable, one attack does not protect against the second. 6. It seems to accompany typhus. 7. Murchison thought starvation and overcrowding might *de novo* develop the poison. 8. The specific germs were discovered by Obermeyer; are long, spiral; they are twice length diameter of red blood corpuscle, are found in blood, urine, and after death in all organs. In stage of remission these spirilla are not found in the blood, only during attack.

TREATMENT.—Person should be isolated, but mortality is slight, 4 to 5 per cent., but in tropics 18 to 20 per cent.; the virulent kind even 60 per cent. Ventilation should be good, disease is mild, needs no special treatment. If constipated, give general purgative, Sellaiz; if vomiting, give Morphia, suck ice, give hypodermic injection of Morphia, gr. $\frac{1}{4}$ to $\frac{1}{2}$ or give Calomel.

HEADACHE.—Apply ice cap.

DEBILITY.—Allow brandy freely. Violent muscular pain, rub with Olive oil and Chloroform equal parts, also Lin Saponis Co.

Relapse cannot be prevented either by Quinine, Salicylic Acid or Arsenic.

Convalescence needs tonics, Iron and Quinine, stimulants (wine), change of air. Convalescence is tedious, good nourishing food needed. The admission of plenty of pure air, frequent washing, and generous feeding will tend to arrest spread of disease; put patient in tent.

IV. SIMPLE CONTINUED FEVER.

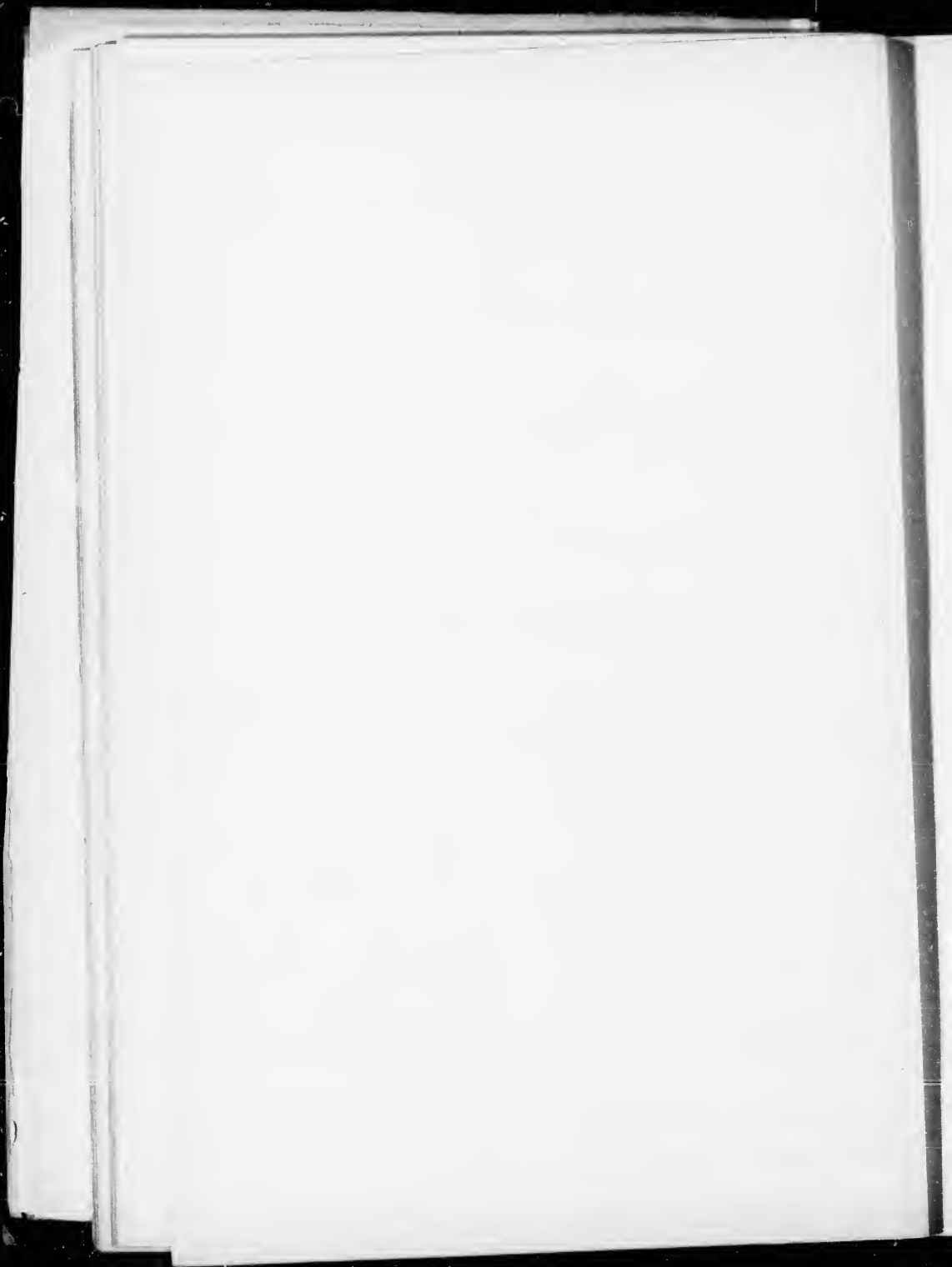
Is quite a distinct fever, is still so recognized, but many so-called examples are cases of a typical typhoid.

ALLEGED CAUSES.—Not satisfactory, do not recognize a morbid poison. 1. Mental or bodily fatigue. 2. Exposure to cold or heat. 3. Exposure directly to sun. 4. Excesses in eating or drinking. 5. Worms. 6. Suppression of functions of skin. It is said to be most frequent in children and youths, occurs sporadically here, but in tropics occurs endemically; is severe there, called *hardened fever* due to sun heat directly.

SYMPTOMS.—Sudden invasion with chill, perhaps malaria. Then sudden rise in temperature as in typhus, with headache, restlessness, furred tongue, thirst, constipation, diarrhoea; vomiting not usually present, muscular pains frequent. There is no characteristic rash. Large bluish, irregular, slight stains occur in all fevers more or less; are seen in this fever, but not characteristic.

HERPES, especially about mouth and face, is common.

COURSE OF THIS FEVER is mild, is called ephemeral or febricula, lasts 26 to 36 hours, in common it lasts 10 to 14 days. Defervescence is rapid, occurs by



crisis, which is accompanied by some critical discharge from skin, bowels or kidneys, etc. In children this fever often presents distinct remissions, called by some infantile remittent fever.

PROGNOSIS.—Very favorable; old or broken-down people may succumb.

ARDENT FEVER (tropic) is frequently fatal, may leave patient crippled for life from blindness, paralysis, mental harm, etc. No morbid poison has been detected. Disease is not communicable, either directly or indirectly. No lesion at all is found.

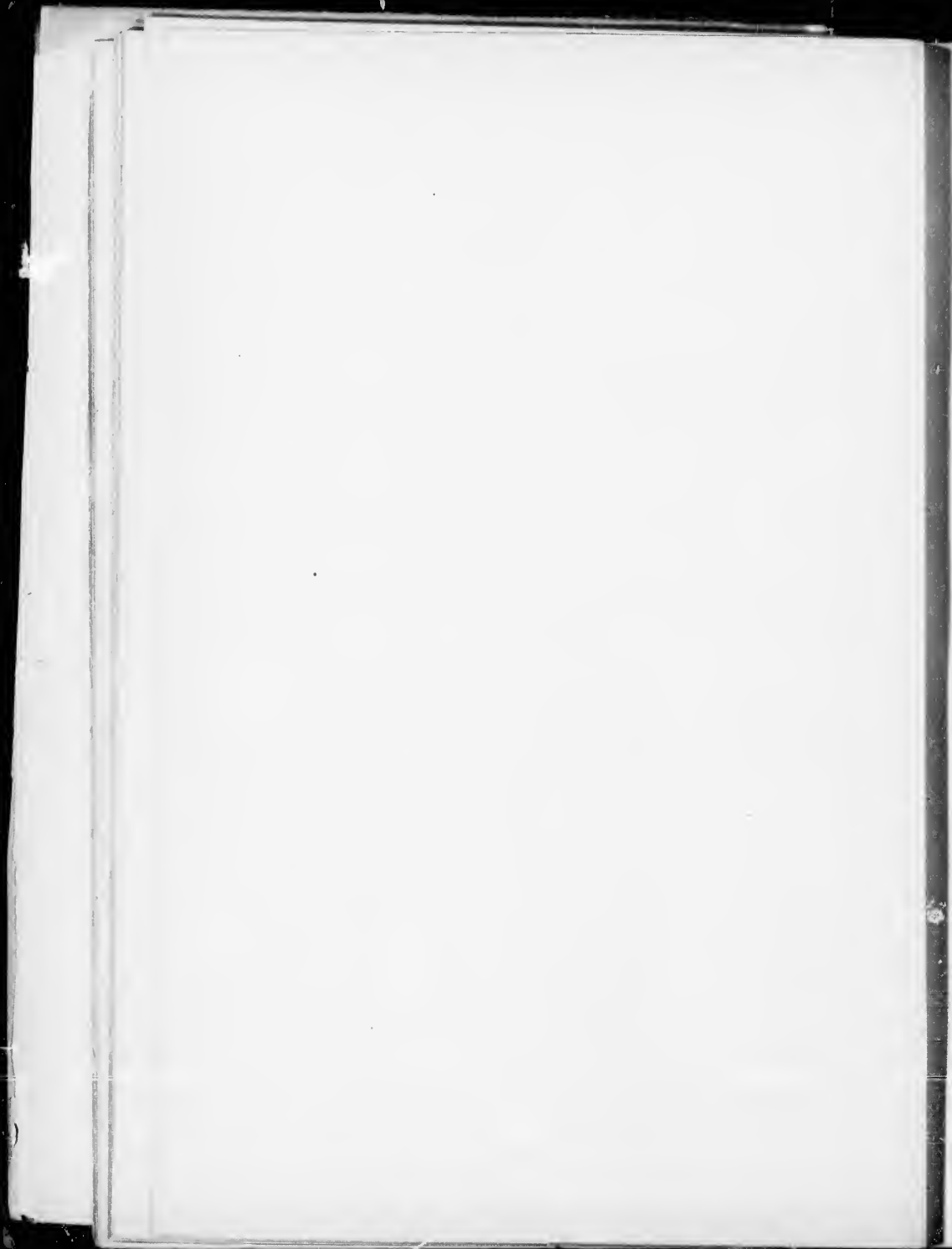
TREATMENT.—Treat symptoms as they rise, plenty of drinks, light food. If over-eating be cause, give broth, emetic, and purgative. In ardent fever, give active treatment by leeching, bleeding, etc.

V. CEREBRO-SPINAL FEVER.

Germans call it cerebro-typhus, called typhoid, abdominal typhus; has been called petechial fever. It occurs frequently in Canada; four clinical varieties, namely: 1, simple typical; 2, toxic; 3, mixed; 4, atypical or abortive.

1. SIMPLE FORM.—May be preceded by symptoms of fever, as headache, vomiting, sometimes diarrhoea, pains down back and limbs, chilliness, but usually disease sets in by distinct rigor like typhus, severe headache, pains down back and limbs, vertigo, vomiting (cerebral). The intensity at onset is characteristic of this fever. Soon after signs of irritation are seen, pupils are contracted, intolerance of light, belly-ache, tetanoid spasms in limbs, etc. Temperature so far may be only 105, pulse 120. Soon patient gets restless, delusions alternating with periods of stupor, perhaps interrupted by loud cries on account of pains in limbs. At this time muscles become rigid, tetanic arms partially flexed, legs ditto, belly hard, and head drawn back almost at right angles, as in opisthotonos. Along with these are severe neuralgic pains, twitching is seen in eyelids, spasm in their muscles. There may be general hyperaesthesia, so both motor and sensory nerves are involved. Temperature—105 is about as high as it goes, no variation a. m. and p. m. as in typhoid. There are partial remissions also, no typical course. Pulse is also very irregular, 120 one minute, 100 perhaps the next. Is never very slow. Tongue may be moist or dry, clear or furred. Bowels generally constipated, but may be loose. Urine not much altered, may be retained. Case terminates by exhaustion, coma, apnoea. Cases have proved fatal 1 to 2 days. It commonly proves fatal in 7 to 8 days, may last 2 to 3 weeks.

2. TOXIC FORM.—Sets in with great suddenness, marked depression of vital powers and blood changes shown by hemorrhage. There are no premonitory symptoms, but has extreme rigor passing at once into collapse. Features cyanotic. Eyes sunken, with blue halo. May be shivering, pain in the head or back, or vomiting (black from blood). Drowsiness or stupor speedily sets in; may be accompanied by delirium. Petechiae form on surface, feel shot-like. Dark purpuric spots, ecchymoses. These cutaneous hemorrhages may occur at very outset, or 1st or 2nd day. Pulse rapid, falling with ease. Urine albuminous. Surface cold. Loss of consciousness, convulsions. Prognosis, recovery rare.



3. ABORTIVE FORM.—Towards decline of epidemic these milder forms are more liable to occur, severe forms at first. True also of cholera. Patient may not take to bed. Complaints of stiff neck, pain in the head and neck, and vomiting. In some epidemics, in malarial districts, an intermittent type is described. Skin—no characteristic eruption, but petechiæ, profuse spots, etc., due to hemorrhage, greatly resembles rash of malignant smallpox. The eruption is early.

HERPES.—Little vesicles on the face, also patches of erythema, rose rash, urticaria. These do not come on late but early in the disease.

DEATH may be in worst cases 38 hours, 2 to 3 days, commonly 12th to 14th day. Majority who die do so in the first 5 days. Convalescence is slow, 3 to 4 weeks.

RELAPSE may occur, atrophy and debility may follow, lasting 3 to 4 months. Mortality 20 p.c. to 80 p.c. Most cases at onset of epidemic. May die from apnoea if in the first few days, or from destruction of blood.

COMPLICATIONS.—Inflammation of parotids, suppuration. Inflammation of bronchi and lungs, very fatal. Inflammation, purulent, of ear, labyrinth, resulting in deafness. *Iritis, choroiditis or retinitis* usually affecting only one eye. *Optic neuritis*. Inflammation of larger joints and effusions into them. Sloughing bedsores. This fever is often found associated with other diseases in same patient.

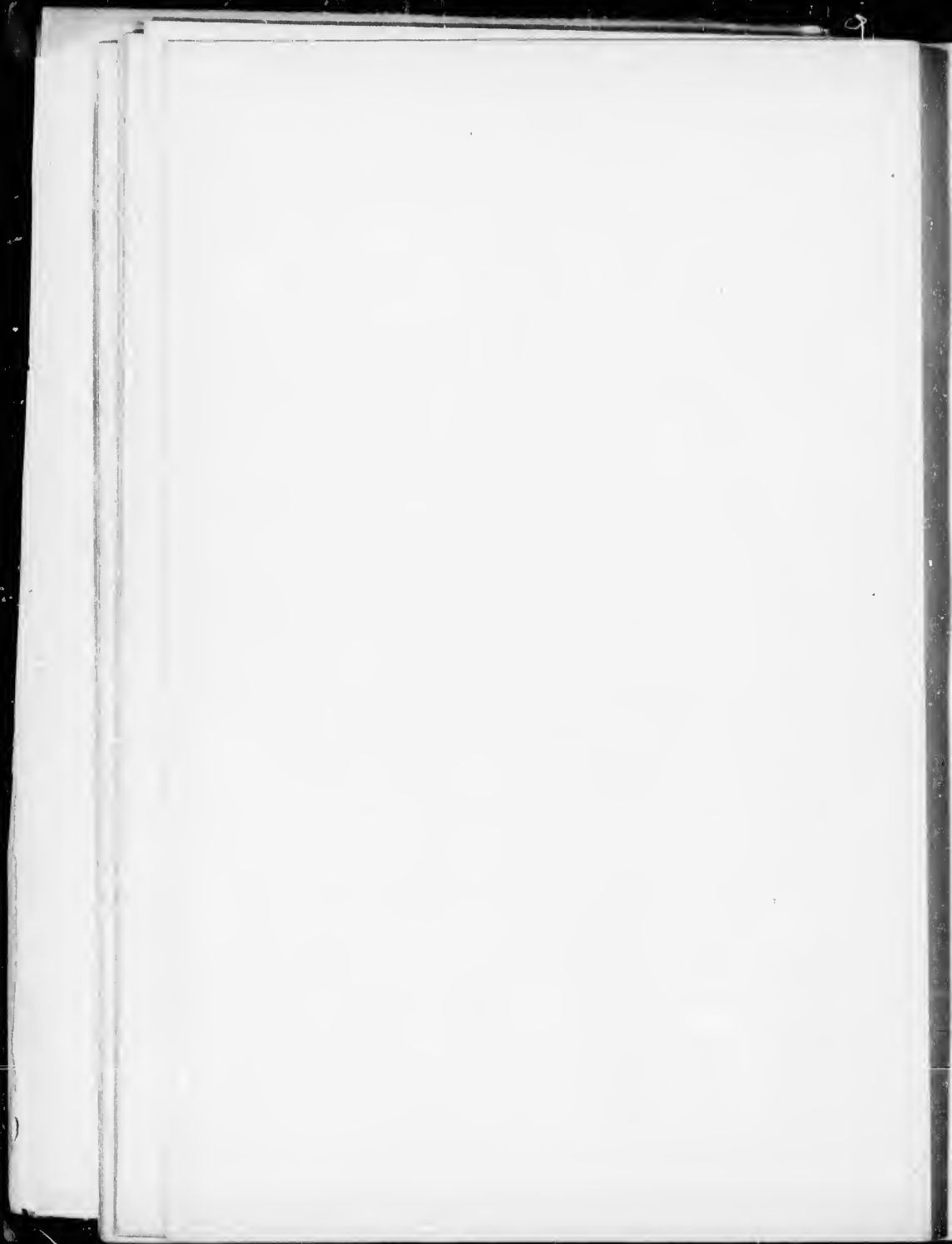
SEQUELÆ.—Deafness, blindness, hemiplegia, or local paralysis (frequently recover), chronic hydrocephalus (hopeless). This fever has special lesions,—used to be called cerebro-spinal meningitis.

POST MORTEM APPEARANCES.—Acute congestion of membranes of base of brain and of cord posteriorly. Later on there will be effusions of serum and pus, substance of brain suffers, minute extravasations of blood, with halo of congestions in both brain and cord. Is graver lesion than meningitis. If patient dies early these changes need microscope to demonstrate, but with it leucocytes and pus cells can be found in inflamed area. In mild cases only meningitis is present. There are also lesions common to other fevers. Hypostatic congestion. Extravasation of blood in mucous membranes. Intestines are free from disease.

ÆTIOLOGY, predisposing cause, infants and children especially liable, rarely attacks after forty years of age. Climate and soil do not influence, rare in tropics, is more prevalent in cold months,—Winter and Spring.

SANITARY CONDITIONS.—Weight of evidence is that overcrowding, bodily and mental fatigue, destitution common in barracks, especially of recruits, also in poor houses, jails, etc., predispose; unsanitary surroundings must lower vitality of body, hence lowers resistance power.

EXCITING CAUSE.—A specific morbid force, not yet isolated, source and habitat not known, believed to be inhaled, and perhaps swallowed. Is not directly contagious, is placed among miasmatic contagions like typhoid, is not highly contagious. Ergot of wheat is not its cause.

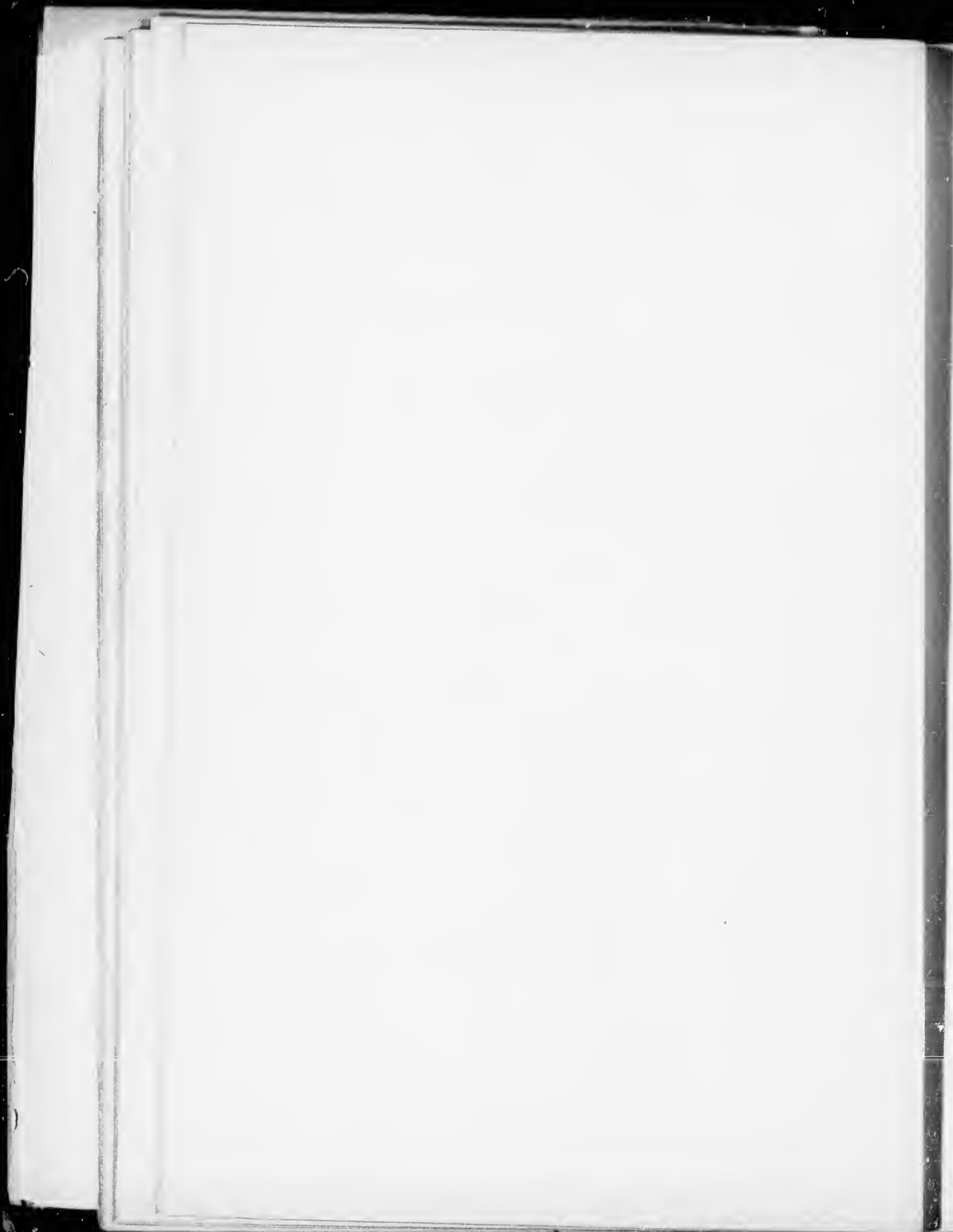


TREATMENT.—Apply general rules for treating fevers, as to antipyretics, diet, baths, etc., nursing and ventilation. But specific lesion requires specific treatment, same as if of traumatic origin. In acute attack of meningitis: 1. At outset apply ice to head and along spine, watch effect, you may need hot water at the feet at the same time. 2. Abstract blood by leeching or cupping, apply leech behind ears or in nostril, suitable to vigorous cases; in authentic cases do not deplete. General bleeding will not do, for it will weaken. 3. Apply blisters to occiput and back of neck, leave on long enough to vesicate—4 to 5 hours.

INTERNAL REMEDIES.—To lessen blood supply to brain and cord and lessen tendency to convulsions and spasms.

SPASMS.—Any of the Bromides K. or Na, generally combined in this fever with ergot or belladonna to lessen blood supply. A child 4 to 5 years, early stage, head retracted, pain, etc. Give K Br. 5 to 6 grs. at least, and add m. 5 of Fluid Extract Ergot, or m. 2 to 3 Fluid Extract Bellad. Effect will be to allay pain and spasm and restlessness, so giving sleep; above doses given every two hours. Even here you can give Pot. Iodid, as antiphlogistic, say to each of above doses add grs. 2 to 3. When second stage appears (prostration) omit the Pot. Bromid, but continue the Iodid to promote absorption of effused serum. R. Ergotine gr. 1, Extract Bellad gr. $\frac{1}{16}$ th, may be given alone every 2 hours instead of first prescription. Mercury is not used by English or Americans, but Dr. Howard would give Calomel 1 gr. every 2 hours. Quinine is valuable. If fever is high—105 to 106—give antipyretic. For restlessness or headache nothing can compare with Opium; give hypodermic injection of Morphia. Loomis would keep patient stupid with Morphia. You may supplement treatment by hot application down the spine, as mustard plaster, liniments, etc. From beginning try and maintain nutrition. At end, when heart's action is failing, stimulants are needed, and often they will take large quantities. Do not be afraid of quantity. In convalescence—tonics, quinine, iron, change of air, secure a dark room, elevated position of head, freedom from noise.

DISINFECTION general respecting fevers. Duty is to destroy. Mattress and pillows should be covered with rubber sheet. Bed linen and personal linen should be removed, and (at bedside) immerse in a tub of hot 1 to 40 Carbolic Acid, and then carry to lavatory. These clothes should be boiled. Washing persons, nares and body use 1 to 40 Carbolic; in bed-pan use disinfecting solution before it is used, $\frac{1}{4}$ pound Chloride Lime to 1 gallon water. Always put pint of above in bed-pan before using. Afterwards put a quart on top of feces and let stand for 3 to 4 hours; 2 drs. Hyd. Perchl. and Pot Permang. to color to 1 gallon water may be used. Do not empty into water closet, but bury in the ground far from any well. Some clothing can be boiled to destroy germs, but carpets, pillows, etc., need exposing in an oven to 230 degrees temperature. This will destroy germs.



VI. MALARIAL FEVERS.

Called intermittent, remittent, pernicious, and one variety of yellow fever. The German school add continued fever to above. When these malarial fevers become continued they are grave cases. Pernicious is malignant.

These fevers are due to subtle miasma which arises from the soil in marshy districts and along the shores. This is inhaled or swallowed, acts as a morbid poison, and gives rise to symptoms of malarial fever. This poison lies latent in the body (incubates) for a longer or shorter time. 1. This miasma depends on the presence of decaying vegetable matter. 2. On certain degrees of moisture and temperature. 3. Exposure to the air. The nature of this miasma is that it depends on a specific germ; a certain algæ is found in air and in marshes, and a certain body has also been discovered in blood of malarious patients. Osler has proved that earlier researches (by Italians) are accurate. This germ (found in blood) is found thus in red blood corpuscles. A little hyaline body is found, possesses amœboid movement. This body becomes progressively pigmented, grows, and finally fills the red cell, thus destroying it. It may now escape or may undergo segmentation arranged in the form of a rosette. The cell wall now disappears and these bodies escape into the blood, and there are found as small pigmented bodies. Beside these bodies little crescentic bodies are found both outside and inside (smaller) the blood cells. A small pigmented body is also described either as spore or a young body. On the outside of those pigmented bodies long cilia 2 to 6 in number project, and are used to propel it. Both Osler and Councilman have found that when Quinine is added to blood these bodies disappear. First they cease to move, then disappear. In the active stage the pigmented bodies abound. In the chronic stage the crescentic bodies abound. It is especially the pigmented bodies which the Quinine destroys. Osler calls it an *infusoria*, another a fungus mycotozoa (?). A proof that both these germs are cause of the fever is that inoculation of blood containing those bodies conveys another wise noncontagious fever. This theory is further favored by: 1. It meets best conditions under which it would be needed to exist. 2. Reappearance of malaria long since rid of, it proving local conditions without the germs are innocent.

PATHOLOGY.—A slight attack of intermittent fever has spleen enlarged by congestion; during the febrile stage red blood corpuscles are extensively destroyed. The fibrine factors are diminished, and blood loses its power to coagulate, and is dark in color. Red cells decrease, white increase. Long attack, or if patient has malarial cachexia, changes are greater. What are changes produced by long continued attacks or after cachexia? Spleen enlarged, pale, capsule thickened and adherent, ague cake, due to hyperplastic development of cells, may undergo amyloid degeneration, may weigh 6 to 30 lbs. In late stage it may atrophy, pulp disappears, and trabeculæ thicken.

LIVER suffers also, early and frequently, by hypertrophy of its connective tissue, may be pigmented, slate grey color. Cirrhosis is rare. Liver may be congested, etc. **KIDNEYS.**—Amyloid degeneration or tubular nephritis. It is doubtful if cirrhotic kidney is so produced.



PATHOLOGICAL changes in pernicious forms.

SPLEEN enlarged, congested and softened, like a bag of blood. Infarctions also are found. These may suppurate or suffer from gangrene. Liver, kidneys, lungs, brain, etc., may thus suffer. Extreme congestion and its consequences, as œdema, hemorrhages, will sum up the changes; this is applicable to all organs, mucous surfaces etc.

HEART is soft, flabby and dilated. Blood especially suffers, caused by disease of: 1. Spleen and liver. 2. Consumption of blood by the fever and waste of albumen. 3. By direct action of the poison destroying the red blood cells. Changes in blood are remarkable reduction of red cells, as 5 to 1 (5,000,000 red cells in cub. m. in health). White cells not specially affected may be reduced or increased. Albumen, etc., is decreased. Yellow and black pigment granules are found in the blood, due to broken-down hæmoglobin, may cause melanæmia found in liver, brain, spleen, etc. Presence of this pigment must disturb functions hence acting as emboli, hence delirium, jaundice, bronzing of skin, etc. These changes apply to all the malarial groups, *i. e.*, intermittent, remittent and continued.

INTERMITTENT FEVER OR AGUE characterized by paroxysms of fever recurring at stated intervals, and absence of fever between them. The intermission lasts from fall to rise of temperature. The interval comprises full length of wave; thus if a fever occurs every 24 hours you have a quotidian fever, if every 48 hours it is called a tertian fever, if every third day a quartan fever. There are also irregular forms, as double tertian, double quotidian and so forth. That is, in double quotidian you have fits of alternate days more severe than intervening days; in double tertian you have a fit every day, but that of alternate day is most severe. The quotidian and double tertian forms occur chiefly in hot countries.

INCUBATION 6 to 20 days, but may be shorter—12 is average—104 days has even been recorded.

ATTACK may be sudden, but frequently it is preceded by malaise, pains in back and limbs, lassitude, weariness general to all fevers, but in this disease a disturbance of appetite with furred tongue is seen early in the attack. Urine dark.

THREE STAGES OF PAROXYSM.—1, Cold stage; 2, hot stage; 3, sweating stage.

COLD STAGE is accompanied by shivering, etc., but thermometer will show signs of fever. The extremities are cold, skin pale and cutis anserina (goose flesh) seen, pulse slow and small, may be irregular, tongue pale and moist, nausea and even vomiting. Secretion scanty, but urine is pale, copious, but soon is found to contain an excess of urea accounting for accompanying heat, breathing hurried and irregular, thirst. Patient is low-spirited, dull and depressed. Intellect sometimes confused, drowsiness, coma. This cold stage is succeeded by

HOT STAGE.—Gradually attaining a temperature of 103, 105, 106, 108, 110 even, but 103 to 105 in ordinary cases. Pulse rapid, soft; if patient prostrated, pulse is very weak. Respiration is hurried. Urine is scanty, but contains excess

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of urea till near end of hot stage. Head has violent pains, sometimes delirium, etc. This hot stage lasts 1 to 2 hours up to 18 hours. The shorter the intervals the longer the febrile stage. In this hot stage herpes on lips is seen. A diagnostic sign of value against typhoid. This stage is succeeded by the

SWEATING STAGE, may be profuse, accompanied by fall of temperature even below normal. There are atypical cases. Dumb ague is when the chill stage is absent. When the sweating stage is absent there may be diarrhoea, excessive urine, etc.

CONDITION DURING INTERVALS.—After getting used to the fever in the days of remission he is as well, feels as well as anybody else; this stage is reached gradually.

COMPLICATIONS.—Inflammation of lungs important, serious, also bronchitis, inflammation of liver, stomach, bowels, etc., as catarrh, dysentery, etc. When complications occur, the intermission becomes indistinct, for the complication continues the fever.

CHRONIC MALARIAL CACHEXIA.—A chronic malarial sufferer gets a cachexia, but a long resident of a malarial district may get this without actually having had a malarial attack.

SYMPTOMS.—Color pale and sallow (liver), or a dusky slate hue from pigment. Countenance looks depressed. Digestive organs are disturbed, tongue coated, appetite poor, perhaps constipated, stools clay-colored (liver), perhaps diarrhoea or chronic dysentery, urine has bile pigment. Spleen generally enlarged (ague cake), also liver, blood anæmic, accounting for breathlessness and palpitation on exertion, cold extremities, dropsy of extremities. In blood a deficiency of red cells is seen and pigmented bodies are found. No elevation of temperature is observed, unless an attack of fever occurs. This cachexia may prove fatal through asthenia, dropsy, or amyloid degeneration of liver, kidney, etc., or some intercurrent disease may kill the weakened person. A peculiarity of malarial disorder is that it imprints a liability to attacks of periodic disorders. Hutchinson says effects of malaria on constitution are permanent, and establish a malarial diathesis, making one susceptible to it, as shivering, causing rigors. He also says malarial diathesis will be transmitted by parents, and if continued exposure of generations occurs in malarial districts, the race will degenerate physically and mentally. Ague appears sometimes to be superseded by other diseases, as neuralgia, hysteria, epilepsy, etc. These are really attacks of masked agues, that is, they are attacks of disease, type of intermittent, but have symptoms foreign to it. They are non-febrile, but occasionally are accompanied by moderate febrile manifestations, and lastly they depend on affections of nerve tracts. Generally they are quotidian. There may be remissions instead of intermissions; attacks occur in morning and last a few hours. These attacks may be independent, but may be preceded or followed by an attack of ague, or these attacks may alternate with genuine ague attacks. In these cases the spleen escapes enlargement, and the urine may give no sign. It is singular that the

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frontal branch of the 5th nerve is most liable to be affected, hence brow ague, but any other nerve may be involved. An opposite condition to neuralgia, that is, anaesthesia, may occur. Again, the motor nerves may be involved, leading to cramps, spasms or hemiplegia, paraplegia, etc. The muscles of face are most liable to attack, also of tongue, oesophagus, etc. Brain centres themselves may be disturbed, noises in ears, flashes of light, delirium, inability to swallow, etc. Even organic diseases, as inflammation, pneumonia, congestion, etc., may shew a change with a change of ague, shewing intermissions as it does. There is not a nerve in the body that malaria may not attack, it attacks nerves as well as digestive system.

TREATMENT.—The cold stage in our climate is not serious, but in tropics must be cut short, as it is depressing. If chill sets in after meal, give an emetic. At any rate apply blankets, hot water bottles; do not give alcohol or warm drinks in the beginning, lest reaction be too sudden. A large single dose of Laudanum $\frac{1}{2}$ dr., and Spts. Chloroform $\frac{1}{2}$ dr., is best agent to give by mouth at one draft 6 hours before attack. If collapse is threatened, give stimulants, employ friction of skin, apply heat. Hot stage, take off the excess of blankets, etc., give some cooling drink. If constipated, give a mercurial purge, Calomel 10 grs. In this country Quinine is given even in the hot stage, especially if temperature be very high, dose 10 to 20 grs. in pill or powder, better in solution.

SWEATING STAGE.—No interference called for; some think administration of Quinine should be preceded by a purgative, but American doctors do not, unless digestive system calls for it. Instead of single doses of Laudanum before attack you may give Quinine 3 grs. every 3 hours, add a few drops of Laudanum to each dose. You may substitute Iron, Arsenic, for the Quinine. Arsenic has similar specific action to Quinine. Quinine sometimes has no control over ague, long attacks, etc. Arsenic will then act, dose m. 5, 3 times per day, in form of Fowler's Solution. Watch for toxic effects. Another remedy is the Citrate of Ammonia, dose gr. 1 to $1\frac{1}{2}$ in pill, 4 to 5 times per day. It is very successful, does not produce cinchonism as Quinine does.

RELAPSES ARE APT TO OCCUR, often come on 14th to 21st day. These are true relapses—may also occur at shorter intervals. To counteract, give a large dose of Quinine 6 hours before expected return; but if you keep up dosing with Quinine 3 grs. 3 times per day, these smaller doses will be safer plan. 1. They should not expose themselves to cold. 2. Diet should be light and nourishing. 3. Dose with Quinine and Iron $\frac{1}{2}$ gr. 2, Arsenic gr. $\frac{1}{2}$ 3th.

TREATMENT OF CACHEXIA.—1. Remove from district. 2. Let him be well fed. 3. Give internally Quinine, or Quinitin, or Quinidine gr. 2 to 5 per day. Accompany with Arsenic, give hot baths, follow by cold douche.

FOR ENLARGED SPLEEN give Quinine by mouth—recently it has been injected into spleen. Ergotine may be added. Cold baths are useful to tone up. Cold douche over spleen is good. Electricity over spleen may be good. When all fever has gone you can try Iodid of Potassium, and rub externally

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red Iodid of Mercury ointment to reduce ague cake. In masked (larvæ) ague the remedies are Quinine, Arsenic and Iron. Arsenic is especially useful for chronic cases. Quinine ditto for acute cases.

REMITTENT FEVER (malarial).—Some poison produces ague, and this remittent, but in hot climates, especially after wet weather, this form of malaria is found. Frequents coasts of rivers, marshes, water-logged soil, etc. Called also marsh fever, also continued malarial fever. Concentration of the poison favors remittent type rather than ague. The idiosyncrasy of individual also is to be taken into account, or condition of health or blood may affect. Any whose tissues are loaded with effete matters are liable, *e. g.*, drunkard, etc. This fever has forms like ague. 1. Quotidian. 2. Tertian or double tertian. Remittent fever varies considerably.

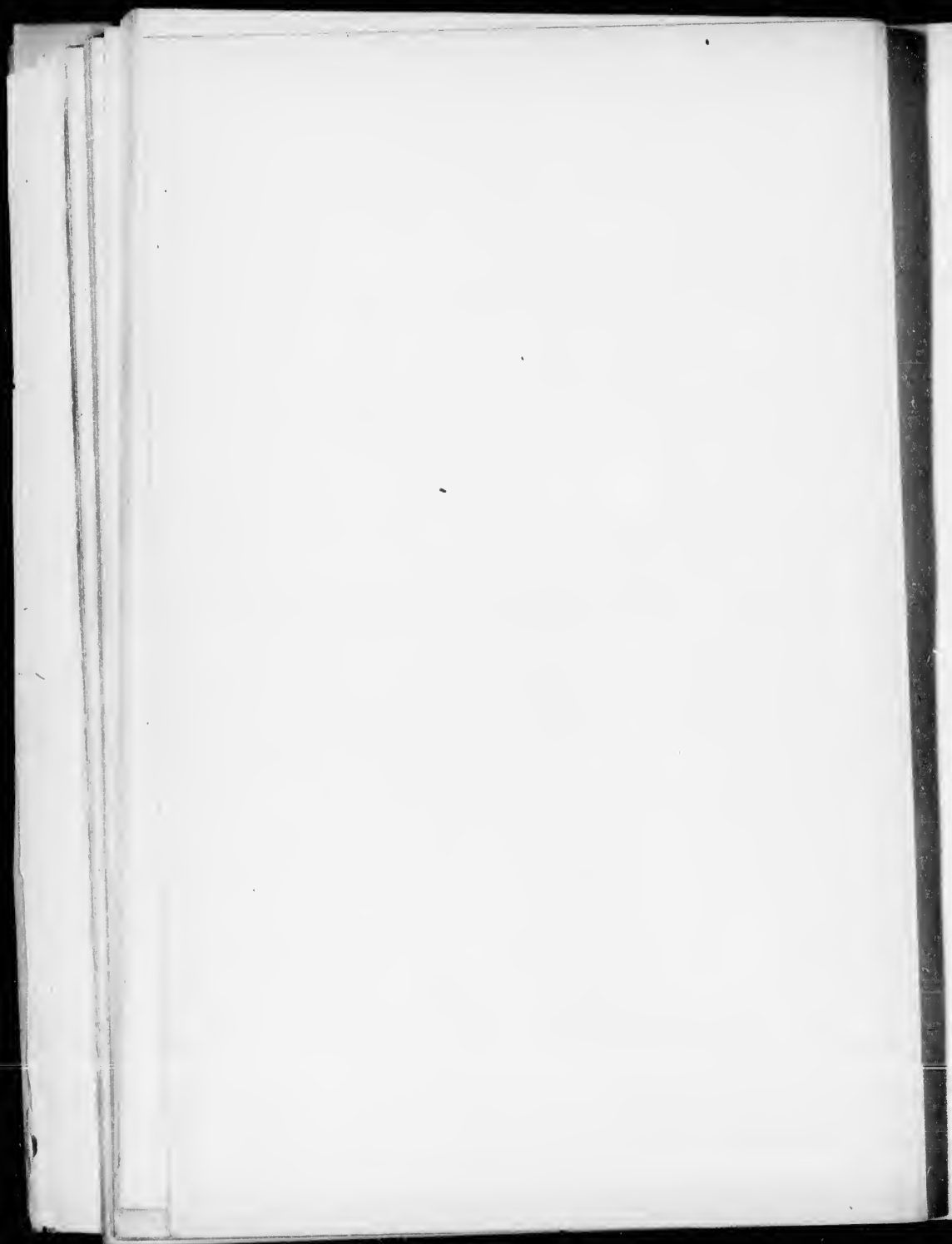
TYPICAL TYPE.—A distinct short chill, a prolonged febrile stage, a sweating stage. 2nd type may shew remissions as typhoid does, morning remissions, etc. 3rd type is called continued form, no let up to fever, common in tropics. All these three forms may exist in the one case.

SYMPTOMS.—Incubation, 6 to 20 days, average 10 to 12, like ague.

COMPLAINTS as ordinary fever, also marked disturbance of digestive organs, hence coated tongue, no appetite, frequently vomiting, diarrhœa, loaded urine, and above all a sense of oppression in epigastrium. These symptoms may alternate with chilliness and warmth, attempts at ague. In many cases these symptoms are absent, and attack is sudden.

ATTACK, chill is slight, may be suppressed, followed by prolonged high 105 fever, headache, nausea, vomiting, etc. This stage lasts 6, 12 to 18 hours. In daily fit, 18 hours is occupied by fever. An interval remission is observed accompanied by perspiration. In first stage remissions are not well marked, another paroxysm ensues, then remissions, etc. Each attack more severe, each remission less marked till 7 to 8 days fever is the continued type.

SYMPTOMS OF CONTINUED TYPE.—Symptoms except temperature do not exceed that of ordinary ague, temperature is higher and more prolonged. Tongue is furred, coated brown. Vomiting is common, contains either bile or sometimes blood, hence black, not common, except in tropics. Stools, diarrhœa severe. Jaundice is often present. Nervous system disturbed, delirium, stupor, etc. Urine high color, shews biliary pigment, no albumen. Mild form ends in 3, 7 to 10 days, rarely lasting longer than 3 to 5 weeks. After temperature is normal, the gastric symptoms may recur, commonly. Severe forms, remissions slight except at beginning, assume typhoid type, tendency to pernicious complications, coma, delirium, collapse. If this severe form is not complicated it ends in 1 to 2 weeks. Severest form "adynamic," a tendency to pernicious complications. Collapse and coma. These forms may end in 2, 4 to 8 days ending in death.



UNLIKENESS TO YELLOW FEVER.

REMITTENT FEVER.

Has remissions.
Not contagious.
Black vomit very rare.

No hemorrhage from mucous surfaces.

No albumen in the urine.

Not before end of week fatal in worst cases.

Succumbs to Quinine.

Pigment granules in malarial blood.

YELLOW FEVER.

Is continued.

Highly contagious.

Tendency to hemorrhage or black vomit.

Hemorrhage from various mucous surfaces, bladder, etc.

Albuminuria.

Early fatality 3 to 4 days.

Resistance to Quinine.

No pigment granules in blood.

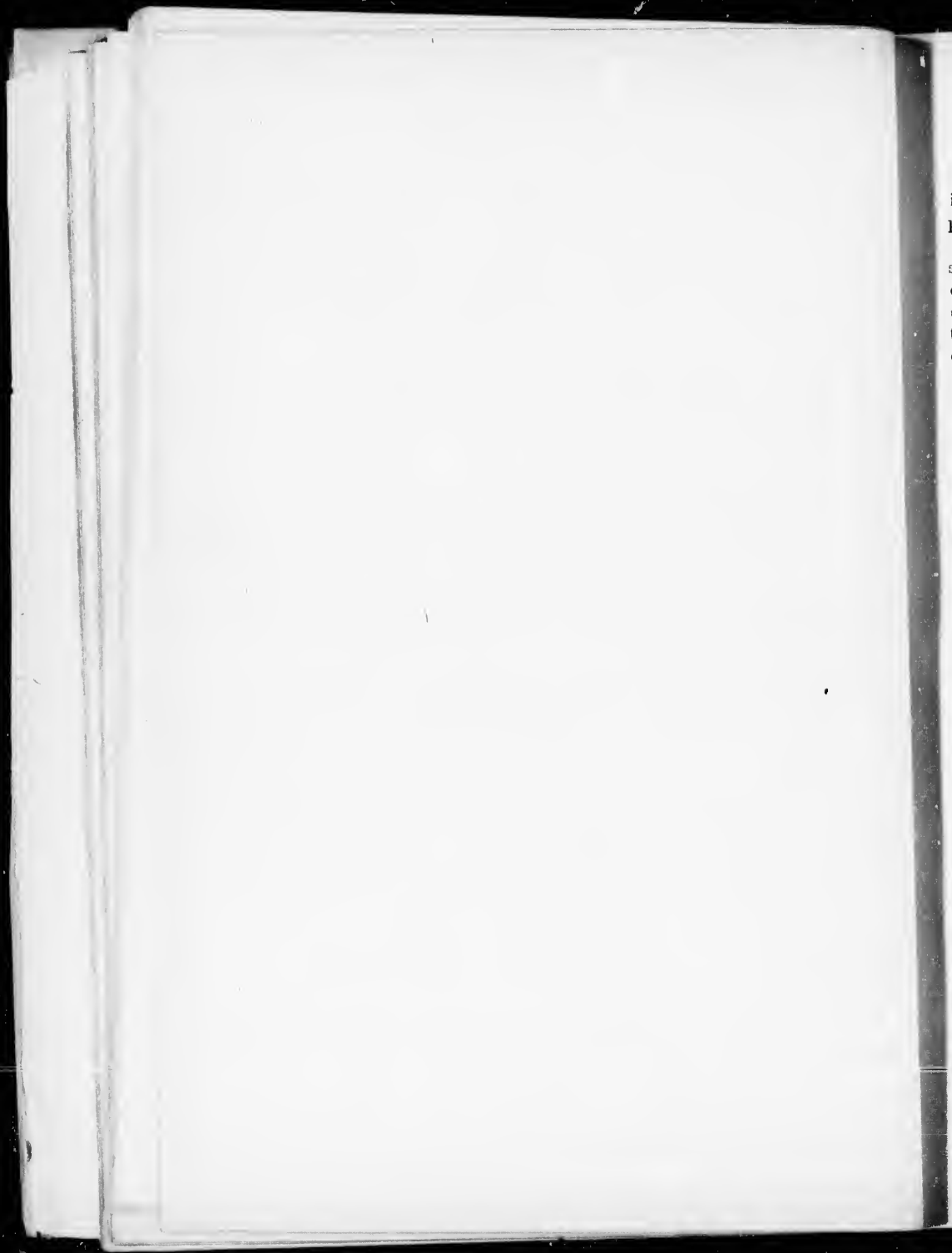
TREATMENT.—Quinine is the great remedy. Do not wait for remittent but give Quinine at once; sometimes tongue much coated, bowels loaded, urine scanty, stools unhealthy, give a mercurial purge, as Calomel grs. 5 to 10, Rhei 20 grs., and after it acts give the Quinine. Quinine is generally given in antipyretic doses of grs. 20, but 5 grs. is often O. K. While the temperature is high, sponging, ice cap, etc., will help to allay temperature. Some think large doses during the fever and small doses during remission checks the fever best. Quinine may fail to act; if so, resort to remedies to act on the skin, liver and bowels, if needed. Give a diaphoretic Pot. Bitart. 1 oz., give purgative, mercurial. Give for the kidneys Salts of Potass., then return to Quinine. An oz. of Cream Tar acts on the skin and bowels at once, give in lemonade. If Quinine again fails treat for a while on general fever principles. And then again resort to Quinine. High temperature is controlled by sponging, baths, ice cap, antipyretics, etc. Headache relieved by ice cap, or coil cap; sleeplessness relieved by Bromides and Opium, etc.

OBSTINATE VOMITING is sometimes distressing. Slapping and beating just a few times epigastrium with towel wrung out of cold water, then lay cold wet towel and chloroform on the part and cover; is useful also in pregnancy.

PERNICIOUS FEVER does not occur commonly in our country; it is called pernicious on account of its fatality. It is most frequently intermittent from tertian type, occasionally it is quotidian. Sometimes it is intermittent or continued. This disease generally begins as ague, and after 2 to 3 fits the bad symptoms set in. It may set in at the outset with pernicious symptoms.

PERNICIOUS SYMPTOMS.—1. Comatose form. 2. Algide. 3. Hemorrhagic form. Also convulsive, delirious, choleraic forms, etc.

COMATOSE FORM not due to cerebral congestion, but coma rapidly supervenes from the fever. Subicteroid in time. Comatose lasting about 24 hours. It may pass off rapidly.



ALGIDE FORM.—Patient is cold, pallid, does not recover from chill. Heart is weak, pupils dilated, collapsed, bowels loose and very thin, urine may be suppressed.

HEMORRHAGIC FORM.—Oozing of blood from mucous surfaces, bladder, nose, stomach, intestines, lungs, kidneys, etc. There are forms shewing jaundice, syncope, etc. In a pernicious attack aim at carrying the patient through the paroxysm. Treatment—Inject 25 grs. of Quinine hypodermically, apply hot water to the legs and thighs, spine, etc. Give stimulants,—brandy or whiskey in hot water or cayenne pepper in water. In the Algide state the strange treatment of rubbing with ice has had good results. Try douches of cold water, and rub briskly with a coarse towel. When giving Quinine give Opium also, or inject Morphia with the Quinine; if convulsions are predominant, give the Bromide or inject Chloral into the rectum. If the secretions be scanty, give a hot water bath or hot air and give mercurial purge. Give Digitalis and Potash for the kidneys. For coma pour jug of cold water over the head, and put mustard plaster over the nape of the neck. Having got patient through the first attack, do everything to prevent another. Give Quinine 5 grs. every 4 hours and a large dose 4 hours before attack is expected.

TYPHO-MALARIAL FEVER is typhoid in a malarial patient. Quinine is especially called for for the malaria.

Treat also on typhoid symptoms.

NON-CLASSIFIABLE GROUP, OR CONSTITUTIONAL DISEASES now to be taken up. They appear to rise from some condition of the system not quite normal, either inherited or acquired. Acquired diseases probably arise from imperfection in some of the functions of the body, as of nutrition secretions, excretion, etc. Constitutional diseases are expressions of certain morbid bias to certain specific modifications of vital action. Many are generated in the body to long imperfect performance of some function, as diabetes with the liver.

DIATHESIS constitutes chief factor in constitutional diseases. It is a state inherited or acquired, leading to a predisposition to acquire certain diseases. This state lasts generally throughout life. This proclivity is capable of aggravation, sometimes of cure.

IDIOSYNCRASY also plays a slight part. It does not imply special live diathesis or proneness to disease, but under certain well-known circumstances results peculiar to the individual, and dependent on definite peculiarities of constitution not known, will produce certain results, thus 20 grs. of Quinine almost always causes headache and deafness, etc. But 1 grain will cause same symptoms in one with idiosyncrasy to this drug. Same applies to many drugs, as Mercury, Arsenic, Opium, morbid poisons, etc.

DIATHETIC STATUS may, besides inheriting, be brought about by climatic influences, as malarial diathesis, rheumatism, etc.; may also be brought about by food, as gout, rickets, leprosy, scrofula, etc.; may also be induced by constant action of cold, as catarrhal diathesis. Hutchinson teaches that all inflammatory affection once experienced may become habitual, as erysipelas, catarrh, etc.

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Boils, carbuncles, certain forms of rheumatism may from a local become a general state. This seems a line of habit, and is especially noticeable in nervous diseases. Habit from a moral standpoint is worse towards moral disease than habit with bodily disease.

VII. RHEUMATISM.

Divided into articular and muscular. *Articular rheumatism* is *acute*, *sub-acute* or *chronic*. Symptoms of acute, premonitory of fever, local affections of the joints, heart, nervous disorders, delirium, convulsions, causes chorea, meningitis and tetanus. Acute rheumatism called also rheumatic fever. Name suggests a morbid poison, but not proven. Acute polyarthritis rheumatica is an inflammatory affection; it is a fever with specific local lesions.

SYMPTOMS may set in without noticeable disorder of health, but set in suddenly, slight chill, pains in the joints and then fever, or premonitory symptoms may be given. Patient is sensitive to cold, pains in the limbs, tongue coated, bowels sluggish, urine high colored, patient feels out of sorts. These symptoms last from 2 to 5 days, followed by a pain in one or more joints accompanied by fever. In rare cases inflammation of the viscera, as endocarditis, may precede that of the joints.

RHEUMATIC FEVER.—Temperature 100 to 104, skin at first dry, but afterwards perspiration free. Thirst, pulse sharp and bounding, 90 to 110, tongue thickly coated with white or yellow-white fur, with red edges, pains in the joints, send patient to bed, bowels sluggish, patient costive, urine febrile, high colored, scanty, solids in excess, and in rheumatism an excess of pigment and of sulphuric acid. As the urine cools lithates are deposited of a brick-dust color. Albumen may be present in severe fever. The temperature in acute rheumatism is in proportion to the number of joints affected. The sweat is highly acid, has a sour smell. The temperature oscillates irregularly, has no typical course; 104 is the average, above means severe, 106 is alarming.

LOCAL AFFECTIONS.—Joints may not always be inflamed. This is rare. In such a case the heart will be affected or some other viscera. Usually joints do not become inflamed until from 24 to 48 hours after the beginning of fever, but they may precede or accompany the fever. Joint may be slightly red, effusion may be slight, or great joints may be painful to touch or movement. This pain varies from uneasiness to agony; occasionally œdema is seen around the joint, but not like as in gout where the veins are swollen. Sometimes the skin looks smooth and shining, but suppuration will not occur. If it inflames and discharges it is not rheumatism but pyæmic arthritis.

ORDER OF JOINTS AFFECTED.—1. Lower extremities, ankles and knees. 2. Upper extremities, wrists, elbows and shoulders. It is usually bilateral, the above order is not constant. The swollen joints of fingers and toes are not usually affected, as in gout or rheumatoid arthritis; nervous system not disturbed except by pain. Rheumatic fever is not always confined to the joints, but is apt to spread to the viscera,—heart principally.

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VISCERAL COMPLICATIONS.—Most common form is endocarditis, affecting the mitral valve, more common in females; it sometimes also attacks the aortic valves. Pericarditis is also common; warty excrescences grow on the valves, but ulcerative form is rare. Circumstances influencing the occurring of this are early age predisposing to cardiac rheumatism up to 22 years of age. It is peculiar to the acute rheumatic form. Neither chronic nor muscular forms commonly induce it. It usually occurs in the early part of the fever, in the first week, and 60 to 70 or 80 per cent. of cases have these complications. This organic affection produces organic murmurs and also functional murmurs. The second may be from weakness of the heart or blood. These murmurs are apt to disappear. The first attack of rheumatism is more apt to attack the heart than the following attack. Heart is rarely if ever affected in chronic rheumatism or rheumatism of a single joint, and never in muscular rheumatism. Affections of the viscera are not really complications, for they are as much to be expected as trouble in the joints.

NERVOUS DISORDERS.—Disturbances of a functional nature: 1. Rheumatic delirium from the 8th to 14th day when many joints are affected and case is severe. Indicated by restlessness, talkativeness, sleeplessness, etc. There is early and great prostration of vital powers, pulse rapid and weak, skin cyanotic, especially at the extremities, temperature hyperpyrexia even 109 or 110, but may be absent from this delirium; skin dry and hot, tongue dry and brown. Cases run a rapid course, generally fatal, ending in 3½ days; in coma may be fatal even in few hours.

CHRONIC NERVOUS DISORDERS may be melancholic, or maniacal, or comatose, not as fatal as delirious form. Convulsive, tetanic, choreic and like forms may be observed, and may be fatal. In all these cases no lesion is found in the brain, at most a little congestion of the brain and membranes.

CAUSES OF NERVOUS DISTURBANCES.—They indicate a vulnerable state acquired or inherited of the nervous system, are apt to occur when many joints are involved, or where visceral complication is present. The hyperpyrexia has been alleged to be the cause, but delirium may occur without hyperpyrexia. The severe pain, the large number of joints, visceral complication, loss of strength, impairment of blood may all combine to cause rheumatic delirium (Howard). If there be a morbid poison which causes this disturbance we would lay the disturbance to its influence.

CHOREA is a functional disturbance of the nervous system. May be present with young children or young adults. Inflammation of the meninges of the brain has been observed, perhaps due to endocarditis of pyæmic or embolic origin. In this rheumatic meningitis the vomiting and pain may both be absent, only delirium present. This occurrence is very rare. Sometimes functional disturbance of the cord is similarly met with, inducing tetanus, etc.; sometimes organic disturbance also. Pneumonia is also a complication, also pleurisy. Albuminuria is a frequent accompaniment of rheumatism. If congestion be extreme there may be hæmaturia.

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SEVERE TONSILITIS (rheumatic quinsy).—Gastralgia, enteralgia, diarrhoea, these may be marked, skin affections, urticaria, also erythema nodosum and erythema marginatum; purpura is also met with, also scleroderma, local oedema, especially around the joints that may involve part or all of an extremity, tubercles, rheumatic nodules attached to the tendons, or fasciæ at the elbows, knees and ankles are found; they come out in crops, lasting a few hours or days, and then disappear.

DURATION.—Rheumatic fever has no fixed period, mild cases last 3 to 4 days commonly untreated cases, pains cease at 12th to 14th day, cure at the end of 4th to 6th week. Now-a-days 4 weeks generally cures.

SIGNS OF RECOVERY.—1. Cleaning of the tongue. 2. Urine increased in amount, but density high. 3. Subsidence of pain and fever (deceptive). In many cases recovery is prolonged, joint after joint becoming affected.

SUBACUTE FORM.—All the symptoms are milder. The fever is absent, or not over 100; joints continue swollen, hot and tender, with tendency to relapse. Case drags a long time, in this no permanent damage results to joints; cardiac manifestations slight, lung complications also slight. This form is apt to occur in weak, unhealthy constitutions. The case is sub-acute from onset.

ACUTE RHEUMATISM IN CHILDREN.—The local manifestations are slight: joints slightly swollen, annoying pains may be the only complaint; children may keep on their feet all the time; it is apt not to affect many joints; lower extremities most apt to be affected. Disease is apt to be sub-acute, perspiration (sweat) not so marked, urine not so scanty or loaded with lithates. Cardiac complications are more apt to affect a child than an adult. They seldom escape, the murmurs are not so rough in pericarditis or endocarditis. Endocarditis is commonest. There may be pleurisy without effusion (no friction sounds). Chorea occurs almost exclusively with children. Delirium, coma and convulsions rarely seen in children.

PATHOLOGY OF RHEUMATISM.—Causes, 7 per cent. of disease is rheumatic. 1. Cold and damp climates, especially changeable weather, rare in arctic or tropical countries, season influences, most in cold and changeable weather. 2. Occupations which expose to weather. 3. Age, disease of early and middle life from 15 to 30 years of age, 30 to 50 less frequent. It is frequent in childhood, but rare under 4 years of age, but no early age is exempt. Sex has no direct influence other than in occupation. A first attack after 50 years of age is a rarity that is of the acute form. 4. Inheritance, it cannot be denied, occurs in from 25 to 29 per cent. 5. One attack predisposes to another. The intervals shorten and the attacks lengthen. Gives rise to a rheumatic diathesis. 6. Scarlet fever puerperal state, dysentery, are apt to be complicated by pseudo rheumatism. Also met with in dengue, relapsing and cerebro-spinal fever, hæmatophilia and myelitis. Their relation to true rheumatism is unknown, but these troubles may be of pyæmic origin, and may be classed as rheumatism, for other poisons set up articular disease besides rheumatic poison. 7. A lowering of vital powers in one

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who has a diathesis to rheumatism gives a tendency to outbreak, fatigue, exposure, hunger, emotion, debauchery, lactation, and traumatism may thus affect.

8. Lactic acid theory. A chill brings about rheumatism by checking elimination of lactic acid and acid phosphates. These cause rheumatism (only a theory). Lactic acid given in diabetes has been followed by rheumatism, thus supporting theory. Objections, no excess of lactic acid has been found in the blood in rheumatism. Its occurrence may be an evidence if found not of cause but effect, also there is an excess of lactic acid in the blood in rickets.

9. Nervous theory (Mitchell's). Cold acting peripherally disturbs the centres and thus disturbs the trophic action of nerves, also of the skin, causing sweating, but the changes in the cord, brain, etc., are probably the effect and not the cause of rheumatism.

10. Due to a morbid poison. This is a probable cause, but not at all proved. Dr. Lathan suggests a chemical cause.

CHEMICAL THEORY.—Glycosin is abundantly formed in tissues along with lactic acid and uric acid, is converted into urea in liver normally, but in abnormal state liver forms it into uric acid, hence rheumatism.

GERM THEORY.—McLagan's. That it is due to an organism introduced into the body, as the fevers, etc.

1. It is febrile affection and so treated.
2. It has local lesions, as typhoid, scarlatina, malaria, etc.
3. Similar inflammations of joints in other fevers occur, as in relapsing fever, also in septicæmia, pyæmia.
4. Visceral complications are analogous to complications of other diseases.
5. Nothing in symptoms or progress but is seen in other fevers, as relapses, etc., hyperpyrexia.
6. Etiology, cold and damp predispose to it, also to typhoid relapsing, etc.
7. A predisposition to rheumatism is inherited, as with tuberculosis. This predisposition may act; a condition of tissues or of whole systems is inherited, may favor the cultivation of microbes. Cold may render system more susceptible to their attack. Arthritic diathesis consists of a state of tissue health transmissible by inheritance, involving a liability to inflammation of joints; in such a state then the specific poisons find symptoms easy to attack.
8. Tendency to recurrence of attacks, as of typhoid, malaria, diphtheria, etc.
9. This doctrine is not opposed to the doctrine that a *casus morbi* is developed in the body, as of uric acid, lactic acid, etc.

DIFFERENTIAL DIAGNOSIS.

ACUTE GOUT.—1. Rheumatism generally attacks several joints at once or in succession; gout generally attacks but one, that of great toe.

2. If gout does attack several joints they are the smaller joints, as of fingers and toes; in rheumatism the larger joints and several joints are involved in succession.
3. Gout attacks the well fed, good livers and drinkers; rheumatism attacks those ill fed (not invariably), and those exposed,—is disease of early or middle life, gout of advanced life.
4. Previous constitutional symptoms are seen in gout. Heredity strong in gout.
5. The acid sweat of rheumatism is not seen in

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gout. 6. Excess of uric acid is found in blood in gout (not in rheumatism); kidneys cannot excrete it as in rheumatism. 7. Want of excreting power of uric acid is observed in gout, not in rheumatism. 8. Visceral complications not as severe in gout. Gout comes on at night usually, rheumatism at any time.

Pyæmia equals "P" when it attacks the joints. 1. The frequently recurring rigors of "P" are not observed in "R." 2. In the intervals between rigors the temperature falls to normal in "P." 3. In "P." abscesses are frequently found in other parts of body, not joints. 4. In "P" the arthritis is more diffused, matter may form outside, does not leave the joint, if confined to joint in "R," may migrate and recur. 5. Rapidity of formation of pus in joint in "P" is general, is rare in "R." 6. "P" does not leave joint uninjured. 7. There can generally be found some cause for "P," as abscess in various parts, gonorrhœa, that is, a local source of pus exists.

GONORRHOËAL RHEUMATISM equals "GR" Diff. Diagnosis. 1. There is the history of present "G," usually he has a urethral discharge at the time, subsequent attacks may occur without fresh urethral discharge. 2. Is also sometimes accompanied by gonorrhœal ophthalmia, conjunctivitis, etc. 3. Frequently in "GR" you find inflammation in bursa about joint, synovial sheaths of tendons. 4. "GR" is more apt to destroy joint, may affect cartilages, may be accompanied by hydrops articuli. 5. Of all Joints "GR" most often attacks the knee, may affect ankle, etc. Even the heel and sole affecting these, the fascia, the fibrous tissue. 6. It is usually uniarticular, one joint affected, but rule is not invariable. 7. It fixes itself to a joint, does not wander as in "R." 8. It is seldom you have high fever as in "R," and seldom is heart attacked. 9. It is more obstinate and difficult to treat than "R." Is almost confined to male sex. Intermittent, articular. Periodical attacks every 10 to 12 days, 3 to 4 weeks of effusions, into 1 to 2 joints, generally the knee, occurs without fever or much pain; attack subsides in 3 to 5 days, effusion disappears, then attack recurs. The periodicity transient duration, incurability are the principal features. It is of neurotic nature, is sometimes associated with ague. Has recurred for 20 years like ague. Pregnancy may suspend the attack. Disease is principally in females. Prognosis good, ulcers with delirium, pneumonia, pleurisy, etc. 2 to 4 per cent. fatal cases. Treatment,—Salicylic Acid, begin with 10 gr. doses, Salic Soda and Citrate of Potash gr. 15, given every hour for 12 hours, after that for next 12 hours the Pot. Cit. above (first 24 hours) for 2nd and 3rd days. On following day if symptoms are abating better continue the same treatment, but when amendment is positive reduce dose of Salic. of Soda $\frac{1}{2}$, ditto in 2nd week, and a further reduction of $\frac{1}{2}$ in third week. The reduction is in Sod. Salic., not in Pot. Cit. Giving T. I. D., Quinine may also be given in 3rd week. If Salic. Soda does not give prompt relief in 3 to 4 days, give Lithium Salicylate grs. 15, T. I. D. or Q. I. D. instead, or you might resort to Antipyrine, Salicylic Acid or its Salicylate, same dose. It promptly relieves the pain in a few hours or in a few days at most, but under this treatment the relapses are more common.

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Hence do not discontinue treating with Sod. Salic. too soon ; too early getting out of bed or too early a return to a rich diet may also cause relapse. Sod. Salic. also reduces temperature. Sod. Salic. does not protect heart against "R" poisons, nor has any agent yet been found. (Spts. Chloroform or Tinet. Card Co. make a fair correction.) Sod. Salic. does not protect against hyperpyrexia, not does it seem to shorten the time of illness more than a few days. Objectional effects are cinchonism, as headache, deafness, noises in ears, vomiting and delirium may accompany. Acid Sal. is completely excreted in 48 hours.

ALKALINE TREATMENT.—No anodyne effect. The alkali was supposed to neutralize the acid in blood. The aim was to give oz. 1 ss. in 24 hours till urine was alkaline. Dose per 4 hours was Sod. Car. dr. 1 ss., Pot. Cit. dr. ss., add Ae. Citrate dr. ss. to make effervesce in a tumbler of water. When urine is once alkaline you can reduce dose half, and after 2 to 3 days lessen half again, or give Quinine 2 grs., Pot. Carb. dr. ss. as tonic 3 times daily. Give Pil. Colocynth if bowels are constipated when needed. Opium, wine, spirits are not given unless latter are needed for heart failure. Wait till tongue cleans before giving solid food, else a relapse. Antipyrine gr. 15, dose every 3 hours. If used acts like Sod. Salic., reduces pain and fever, does not occasion cinchonism as Sod. Salic. does. Is found to best suit less febrile acute attacks. Antipyrine is better than Sod. Salic. in non-febrile articular rheumatism. McLagan's rule: Give Sod. Salic. 15 grs. every hour till you can move him without pain, or give 20 grs. every 2 hours for 6 doses, or even 30 grs. every 2 hours ; reduce dose when you get system saturated. Salol, a combination of Carbolic Acid and Salic. Acid, give in gr. 15 doses every 3 to 4 hours. Is not as good as above. Look out for Carbolic Acid poisoning. Relapses are more frequent than under the Salicylates.

LOCAL TREATMENT.—No special mode of treating inflamed joints. Tie up in cotton wool or put oiled silk about, or hot poultice, and put dr. ss. Nitre in the poultice. Is soothing to paint with Tr. Iodid, or take Liq. Opii Sed. 1 oz, Pot. Bicarb 4 to 6 drs., Glyc. 2 ozs, Aq. 9 oz, and soak lint in above and put about joint, is soothing, cover with oiled silk and a light bandage. If inflammation be very active put on a splint to secure rest. Or put on a starch bandage or plaster of Paris, very useful when wrist is affected, for it takes weight of hand off wrist. Emplast Lyttæ above all affected joints often gives relief, but is barbarous, but you may use it where a joint tends to chronicity. 26 per cent. relapses under Salicylate, treat 16 per cent. under alkaline treatment. Reason is pain is so relieved that you cannot keep patients in bed, etc., nor can you make them keep up medicine long enough.

HYGIENIC TREATMENT of acute rheumatism, room well ventilated and well lighted, but no draughts, it is not wise to put patient in blankets, put on flannel nightgown and cotton sheets. Blankets aggravate the sweating. In examination of heart do not expose, hurry, cover with some thin substance ; hair mattress is better than feather bed. Rub patient down often with dry warm towel, change sheets to get rid of perspiration. Diet, a fever diet, milk and cornstarch or animal

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broths, with barley, gruel, etc., unstimulating diet important to have. When fever has disappeared, tongue cleaned and joints subsided, visceral complications subsiding, then diet can be increased. Diet is of great importance, for nothing tends to cause a relapse as the giving of solid food, even a little. Alcohol should not be given unless specially called for, as when salicylates depress heart, then give a little alcohol well diluted. Animal food must be returned to gradually. Let patient be convalescent a full week before he leaves bed, then sit up a few days before leaving room, else fatigue may bring relapse. In valvulitis, when recovering, do not let patient exert himself, keep to room longer, etc., so as to allow valves to strengthen. Disturbances of nervous system. Nervous symptoms are due to exhaustion, hence give a little wine. Watch cases in which there is restlessness, sleeplessness or stupor or mild delirium, or accompanied with high fever. Watch for hyperpyrexia, push salicylates. In 2nd week exhaustion, still no sleep; give Opium Chloral, or as sedative to nervous excitement apply an ice cap, etc. In hyperpyrexia only cold bath will take down the temperature, commence with 70 in young and strong, but use graduated bath with the feeble, or the wet pack. Even a pleuritis is not a contra-indication of cold bath.

CHRONIC ARTICULAR RHEUMATISM.—Name applied to an idiopathic inflammation affecting usually but one joint, not usually causing deformity. Produces little structural change. Lasts long time; tendency to this may be inherited, where an acute attack previously may predispose (rare). Predisposition. Also residence in cold, damp, windy places will predispose, as with Western women, beer bottlers, etc. Exciting cause is cold or damp, but often no cause at all can be assigned. Especially the joints most exposed to the cold and damp are affected, as wrists in washerwomen, etc.

MORBID ANATOMY.—Chronic inflammation somewhat thickens the capsular region. This thickening may extend to tendons and fascia in the neighborhood, also increases the quantity of synovia. No suppuration occurs. Serious deformity other than thickening and stiffening of the parts involved does not usually occur, but induration and subluxation occur. This disease is allied to rheumatoid arthritis.

SYMPTOMS.—A simple joint is seat of pain constant, and on pressure thickening of the part, swelling sometimes, effusion into the joint. Pain is worse at night and is worse in damp weather, creaking may be heard in joint, pseudoerepitation. The apparent swelling of joint may be due to waste of little used muscles; fever, sweating and local heat are absent. In protracted cases there may be a pseudoankylosis.

TREATMENT.—A long continued use of Salic. Sod. in doses of 15 grs. 3 to 4 times per day for months, or try Antipyrine. Treatment of subacute rheumatism is the same as this, or Pot. Iodid. in 20 gr. doses 3 times per day for months, or Muriate of Amm. 15 to 20 grs. Vin. Colchici 10 to 15 m. given with the Pot. Iodid is also often good. Semicifuge is also used to relieve pain and stiffness in or about the joints. So used in cases resembling "R" Arthritis. When anemia is

present the addition of Quinine wine and Arsenic in addition to above may be valuable. Cod Liver Oil as a nutriment is also used, electricity, both kinds, applied to joint may relieve pain and promote absorption. Use of warm baths a long course for constitutional treatment. A good hot bath lasting one hour. A series of 30 baths of 95 deg. at even a temperature of 108 will do good. Hot baths act by promoting secretion, favoring circulation, and thus aid absorption. Hot baths may harm by irritating the skin. It is the heat of the hot water of Banff and other hot springs which does the good. Leave in bath $\frac{1}{4}$ to 1 hour. The benefit of sending to a spring is that you put him under skilled treatment. Give good hygienic surroundings, and give the patient hope. The diet can also be better regulated away from home. Turkish bath is also very useful in some cases, in young vigorous subjects even a cold bath would be useful. It seasons against the weather, protect body always by woollens next the skin; electricity seems to be useful.

LOCAL TREATMENT of chronic rheumatism, as a rule no leeching is called for, but counter-irritation by Iodine, Ammoniacal liniments, etc. Blisters above joints are also useful; in acute cases much inflammation may tend to synovitis, hot fomentations, leeching, etc. Not chronic cases like rheumatoid arthritis. R. Tr. Guaiac, Amm. Chlor., Pot. Iodid, when skin is inactive taken internally.

RHEUMATOID ARTHRITIS equals "R. A.," called also rheumatic gout, also osteo arthritis, also arthritis deformans. It is called "R. A." from resemblance to rheumatism, several varieties: 1, Poly-articular form, acute or chronic, also general or progressive; 2, mono-articular; 3, Heberden's Nodostitis.

1. **GENERAL FORM OF 1st (acute)** may be acute or chronic. The acute is very rare, resembles acute poly-articular Rheumatism, but all its symptoms are less marked, less sweat, pulse, heat, burning of tongue, etc., but on the other hand joints are more affected, more effusion into them. It especially begins in the smaller joints, fingers and toes, but also affects large. The adjoining bursæ and sheaths of tendons are also involved, have effusion, etc. It also fixes itself to a joint, persists obstinately as chronic form. Does not attack viscera. This acute form is most frequent in young women of 20 to 30, found oftenest in those child-bearing too rapidly, or after delivery, or too prolonged lactation. Those patients suffer in general health, lose flesh, lose spirits, etc. Improvement is not permanent, a fresh birth or lactation generally causes recurrence.

THE CHRONIC FORM of 1st progressive is more frequent than acute form in all stages between acute and chronic.

EARLY SYMPTOMS.—Numbness, rheumatic pains, stiffness in morning in joint. Fatigue aggravates it. It especially manifests itself in the first joint of index finger. This gets hot, swollen and tender. Treatment may cause it to subside, but attack may recur. Disease may attack an additional joint, as in wrist, but recurs in first joint. More or less complete remissions are observed. Disease extends in centripetal nerve, but is not uniform, may skip a joint or go to the opposite side. In early stage there is a more or less effusion. The posi-

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tion and shape of joints become altered, partly by this effusion, by swelling of bursæ, or by contraction of muscle or thickening of tendons. As disease becomes more chronic, new bone forms around joint, cartilage is absorbed and new masses develop in synovial fringes. Joint is now very much relaxed, subluxations, etc. Even now there is abiding pain, soreness and stiffness, muscles may creak, pain may run along the nerves. Rubbing articular surfaces together may cause grating. Spurious ankylosis may result from new glands of fibrous tissue, interlacing of new bony growth. It is rare that true ankylosis occurs except in the vertebral column. Over these joints the skin is apt to be thin, attenuated and parchment looking, or else thick, drawn tightly. As disease advances fresh joints are affected. Even almost every joint in body involved, as of jaw and vertebrae, etc. It may last for 10, 15 to 20 years, without destroying life.

GENERAL CONDITION in chronic "R. A." There is no characteristic affection, tongue clean, pulse, appetite, temperature, urine, etc., O. K., but urine may be pale. In advanced stages patient becomes dyspeptic, anæmic and debilitated. This "R. A." has no tendency to attack heart, to occasion pleuritis, neuralgia, albuminuria or attack brain. Occasionally it occasions iritis, and skin affections are not uncommon. The rheumatic nodules are sometimes present, as in "R" gout and syphilis. Partial form mono-articular is insidious and slow in developing, occurs mostly in old men, senile arthritis; it especially affects hip, sometimes shoulder, knee or spine. Cause seems to be due to strain, injury, exposure to cold, wet, etc. It sometimes follows attack of "Gon. R." or "R. A.," when it seems to come on spontaneously, 2 to 3 joints may be affected. But even if started say in hip by injury, it will after a few years attack others, becoming more or less general. This affection gradually interferes with movement of joint. It is a stiff sore, pain in the morning, affected by changing of weather. This form may last 10 to 20 years, and patient die from some other disease. Heberden's nodosities,—usually affects last joint of fingers, bony outgrowth takes place from angle of base of first phalanx as large as a pea. It may then affect the other phalangeal joints. The joints are stiff, unsightly, but not much pain. These nodosities may not always be of rheumatic origin. Gout may occasion them, or they may be of traumatic origin. Morbid anatomy, in chronic rheumatoid arthritis every component tissue and joint is affected, either hyperplastically or atrophically. Nodosities, polypi, etc., shew the proliferation. Warty excrescences, etc., on membranes (synovial and capsular) are also due to proliferation. Cartilages disintegrate, undergo fibroid or fatty degeneration, leaving bare bones to rub together. But at same time new cartilage is formed around the rims and heads of the bones, also in the synovial membranes often in great numbers project into the cavity of joint, and so interfering with movements. The bones also increase by ossification of cartilage in contact forming osteophytes, locking joint often. But the bare bones rubbing together produce a low form of osteitis. They become hard and polished like ivory. Deformity must result from all these changes, capsules distended by concretions, heads of bones widen.

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The inner tissue of the bone undergoes wasting, while the outer parts hypertrophy. Capsule may ossify. In hands and feet a state is produced by traction of tendons on phalanges, tilting them at joint upward towards carpus and tarsus and almost to dislocation, like old John Reynolds' hands. *Ætiology*.—First progressive form is the most common in the child-bearing age, rare after 50. Is up to 50 a disease peculiar to females, but males over 50 years of age may have it. Hereditary taint has little influence in direct transmission, but perhaps, indirectly. In tracing family history remember that various disorders are common in most families, and do not mean anything. Mr. Hutcheson insists there is a state of tissue health transmissible, which involves a liability to inflammation of joints, and that this arthritic diathesis may tend to build up gout, rheumatism, etc., if acted upon by certain various causes. Results dependent upon influences acting induce gout or rheumatism, etc. Previous diseases, one suffering from acute rheumatism very seldom develops into rheumatoid arthritis, and cases cited are few. Nervous theory, without this diathesis the exciting cause would not cause the disease. It appears to be a trophic affection, governed by trophic centre in the cord for joints. Given arthritic diathesis with lowered state of function of joints, trophic centres, then peripheral irritants, articular ovarian, uterine acting reflexly, find vulnerable part, hence trophic functions are more poorly performed, hence degeneration in the joints. Gout and chronic articular rheumatism may precede (sometimes). Rheumatoid arthritis are held to act as merely exciting causes to the arthritic diathesis. Sexual organs of women.—Some connection seems to exist between functions of above since this disease often follows parturition, lactation, ovaritis, etc. But may it not be mere coincidence since pregnancy is so common or due to impaired functions, debility caused by pregnancy, leaving system with lowered vitality, predisposing to disease. Dr. Ord says it is owing to reflex nervous influences caused by pregnancy, etc., which reflexly set up these changes. Cold and exposure, hence climatic influence, is commonest cause. Poverty, fatigue, starvation, grief, etc., by long vitality predispose.

TRAUMATISM, as a whitlow, may cause disease in one joint which by reflex influences affects other joints.

HEBERDEN'S NODOSITIES occur chiefly in advanced life, may in the upper classes, or apparently hereditary, co-exist with the poly- or mono-articular forms. It rarely extends beyond the joints first affected. They appear without deposits of urate of soda, unless in gouty persons.

ÆTIOLOGY OF MONO-ARTICULAR FORM begins in old age or advanced life. Is especially a male disease (not absolutely), is less connected with debility or lowered vitality. Attacks first one joint,—a large joint. Is more apt to be of traumatic origin. Generally remains in one joint.

LOCOMOTOR ATAXIA and Charcot's disease both rarely are complicated with disease of joints like rheumatoid arthritis, helping nervous theory in its

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TREATMENT of rheumatoid arthritis. Is a very disappointing disease to treat: 1. If poly-articular arthritis, begin with attempt to find cause. If a female (generally), examine thoroughly the sexual organs for displacements, etc. If children come too fast, tell her so. If lactation is too profuse, stop it.

MEDICINAL TREATMENT.—Salicy. Acid, Iron, Arsenic, Cod Liver Oil, etc. Pot. Iodid, push Soda Salicy. grs. 15 at least T. I. D. for 3 to 4 months, as for acute rheumatism, increase to even 40 grs. T. I. D., if fever is active. Tonics and alteratives. If patient be weak, give some stimulant (whiskey). A prolonged course of Cod Liver Oil is also valuable, or may be combined with above, especially stimulants. Pot. Iodid is also good, 10 to 20 grs. T. I. D. for a considerable time in cases where there are severe pains at night; take in milk or soda water, or Apollinar, Vichy water, begin with 5 gr. doses. Arsenic has been found good Liq. Arsen. 5 to 10 m., or Soda Arseniate, give after meals and watch its effects. If biliary disorders are indicated, hot baths are good, as in chronic rheumatism; gradually rise from 90, 95, 100 to 108 even, in from 20 minutes to 1 hour. A trip to Banff for a few months. An arsenical bath in obstinate cases is recommended. Regular massage treatment and movements of the joints (feasible, if needed) is demanded. In spite of pain, movements should be kept up. Important to maintain mobility. In applying friction to skin use cacao or butter, olive oil, etc. Massage and friction cause absorption, improved nutrition of muscles and nerves promotes function of the skin. Electricity is also valuable, constant current alleviates pain. Electricity promotes absorption; increases nutrition, is also useful in neuralgic pains. Small doses of Nit. Silver are said to be useful to allay pain, etc., but Opium may be needed. Counter-irritants, as blisters, ammoniacal liniments, certain essential oils as peppermint, cajuput or turps, etc., applied locally, are good, or Lin. Chloroform et Arsenic. Do not use Opium if you can help it, but sleeplessness may demand it. Use Bromides for sleeplessness, if possible, or Sulphonal. Diet should be liberal,—milk, etc. Atmospheric changes should be protected against; if tendency to ankylosis pains on your manipulations, you may have to use surgical means by apparatus. Let them get around on crutches, do not lie up.

VIII. RICKETS.

Rickets, 30 per cent. of infants at London Hospital suffer from it, 28 per cent. of children under 2 suffer from it. It is a disease of great crises. It is common in this country; especially amongst French Canadians.

ANATOMICAL LESIONS.—Enlargements at the end of long bones. Softening of all bones. Thickening of the flat bones, skull, scapula, etc. Changes in the size of head, deformities in spine. Arresting growth of bones and muscles connected, or teeth. Lesions of lungs depending on bony lesions. Visceral troubles not due to mechanical derangements. Enlargements of ends of long bones occur at the point where cartilage unites epiphysis to shaft. This proliferates and changes to bone. The bone and cartilage, also periosteum, are more vascular than ordinary. The periosteum of shaft also is proliferating, thickening the

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shaft; but inasmuch as the new cartilage does not ossify quickly, and is accompanied by a process of rarefaction in the bones, the bones bend. The bones may be so soft as to be cut through with scissors. Earthy parts are deficient, so S. G. is less. Flat bones also suffer in skull, and proliferation occurs along margins, causing ridges at the sutures.

DEFORMITY.—1. Of head, it may be apparently large, but may be from want of development of face or body, but hypertrophy of brain may cause large head. The rarefying process may cause absorption of bones, sometimes thinning them like paper, confined to parietal bones. The typical rickety head is square, flat on top, sides, etc. Frontal suture may be marked with ridge in oval head. In early stages passing fingers along sutures gives a feeling of not being united. Ant. Fontanelle may not close for 2 to 3 years, should close about 14 to 15 months. On ribs a projection (pea like) may mark point of junction of ribs to cartilage forming "rickety rosary." This is an early sign of rickets. Curve of spine is altered, cervical curve increased, ditto dorsal curve, and lumbar curve lost in it, hence child sits doubled up. If child walks, the natural curves are all exaggerated. Lateral rotation may be sometimes observed. To diagnose curves of spine from Pott's curves, lift child by arms when curves disappear.

CURVES OF LONG BONES.—A child leans on arms if it cannot walk, hence arms are bent outwards, concavity inwards, a curve is also seen at insertion of deltoid. In child which walks, a curve forward is seen in the femur, concavity behind. In the leg you may have curve in, at knees (knocked) out below, or excessive bow-legged state alone may result from child sitting tailor fashion.

ALTERATIONS IN THORAX owing to softening of ribs (instead of heart shape to a cross section) you get a flattening at the angles, a sharp turn, at the cartilages there may be a falling in and sternum may stand out. This gives pigeon-shaped breast. A vertical groove is seen on each side of sternum. Both grooves formed by atmospheric pressure. A depression, a transverse groove may also occur above liver and stomach and spleen, they preventing a falling in of ribs. This groove is at level of about 8th rib. Diaphragm also tends to pull ribs in, so chest is narrow and belly prominent.

PELVIC CHANGES.—Promontory of sacrum is pushed down and forward, acetabula forced inwards, giving a triangular pelvis. Pubis also is driven in. Stature—Arrest of growth of bones causes loss of stature, hence dwarfs, limbs are crooked. Narrowing of chest gives big belly, wrists, knees, etc., all joints are enlarged. The arrest of development chiefly affects lower extremities one-third, upper only one-thirteenth. Healthy English children grow 2 in. per annum, 3 in. is excessive, less than 2 in. is arrest. In rickets, cutting of teeth is arrested. In health it starts at 7th month, ends at 24th month, but in rickets they start 8th to 12th month, and several months may elapse before molars come through. If you cannot account for delayed dentition to some illness then it is a sure sign of rickets. In p. m. a white spot is seen in heart where it strikes against contracted ribs. Ditto with spleen. Spleen is enlarged. Changes may occur in liver and lymphatic glands, heavier

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than usual and harder to cut. In spleen, changes are due to habitual congestion and hyperplasia. Morbid anatomy.—Liver is also enlarged by congestion or fatty degeneration, causing hypertrophy; lesion not grave, is curable. Lymphatic glands are indurated and enlarged. There may be slight increase of white corpuscles of blood and decrease of red cells. Brain sometimes is smaller than it ought to be, and space is filled with water, or cerebro-spinal fluid, but occasionally brain is hypertrophical. Urine Pot. Carb. is found in sediment, some say urinary calculi are common in rickety children.

SYMPTOMS.—1. Age. Is disease of early childhood, beginning 4th to 12th month, but is met with at second year, is of primary dentition, or even at 7 to 9 years. Not settled whether congenital or not. 2. Disorder of bowels—loose stools, grey, much mucous, not always present from catarrh. 3. Feverish, dull, languid, perhaps sleepless. 4. Profuse perspiration about head and neck, pillow in a. m. wet. 5. Incessant tendency to kick off bedclothes. 6. Extreme tenderness of body, cries in lifting, should lift with hand under and under body. These last three symptoms are characteristic, child avoids play, too weak. In older children there may be an absence of intestinal catarrh and wasting of body. Do not complain of such body soreness. As disease progresses child looks prematurely old, and from not playing with children gets old-fashioned. Rickety rosary is now seen, enlarged joints of extremities. Appetite may be good, but stools loose, muscles waste (no exercise), abdomen is usually prominent, partly due to flatulence or due to down thrust of diaphragm in a contracted chest. Skin pale and opaque. Intellect deficient, although child is old-fashioned. White cells may be increased, not often, but there is a deficiency of red cells or hæmoglobin. Urine nothing characteristic.

MARKED RICKETS.—No complete set of symptoms, head only may be rickety, or chest, or delayed dentition may be only sign, or child may not walk early. If it cannot walk at 18 months, and no reason can be given, then it has rickets. Relaxation of ligaments is also a sign. Many of the early deformities of rickets disappear with advancing years, marked deformity lessens, bones are strengthened, even stronger than natural, glands subside, etc.

COURSE OF DISEASE.—Duration 6 to 12 months, when convalescence should ensue, but relapses are common if causes again exist.

RICKETS, *per se*, does not often kill, but indirectly it kills many by complications. 1. Rickety cachexia may kill. 2. Persistent bronchitis kills many, severe bronchitis or catarrh are common. This is a good sign of rickets, look for other signs. 3. Laryngismus Stridulus, spasmodic croup, crowing noise, kills many. It is almost always caused by rickets. If it comes on spontaneously, kills many. 4. General convulsions, sometimes tetanic. If you can exclude some eruptive fever, or pneumonia, or some acute disease, then convulsions mean rickets. In all cases of convulsions, statistics give 56 out of 61 caused by rickets usually get well. Bronchitis, spasm of glottis and convulsions are the 3 great causes of death in rickets. Hydrocephalus in children is a mechanical

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sequence on small brain, is seldom serious. Rickety children are somewhat liable to cataract.

ACUTE RICKETS is probably really scurvy occurring in a rickety child, although amount of rickets may be slight. This infantile scurvy differs from adult in attacking bones or periosteum. In this affection there is multiple epiphysis at joints and multiple periostitis of long bones. The process runs a rapid course, a few weeks at outset, 2 to 6, is febrile, pulse rapid, diarrhoea, etc.

CAUSES OF RICKETS—Differences as to whether inherited or not, but a tendency to such a disease may be transmitted. Still, inherited rickets is only 9 per cent., is rarely through father, is not a syphilitic affection, although a syphilitic weakening may predispose. Again syphilis (inherited) produces a similar disease of joint bone as rickets, ends become more vascular, softer, periosteum undergoes proliferation, thickens, and osteophytes form. Epiphysis may become detached, pus may form in joints, and escape. Suppuration does not take place in health. Delicacy in mother tends to produce rickets in child, repeated child-bearing seems to do same, as latter children are rickety, due to lowered vitality of mother, or in poor, the larger the family the poorer the diet. Allowing improper food during dentition, allowing run of table instead of milk. Deficient ventilation, want of fresh air, of cleanliness, all predispose. Diseases which weaken, all tend to produce rickets, as dysentery, syphilis, etc. Nothing is known of pathological causes, why cartilages grow and will not ossify, etc. Niemeyer has a lactic acid theory of cause of rickets; again, salts of lime may be deficient in food or may not be absorbed by the child; salts of lime diminish after 7th month of lactation and after 20.

TREATMENT.—Inquire into child's health and surroundings. How is it fed. If from bottle get a good wet nurse, or feed suitable artificial food. Barley water and milk 4 to 1 and a little salt is good up to 6 months, at 6 months give equal parts of each. In some cases the addition of dr. ss. of salt a lblel to each day's meals will help digestion, or dr. ss. hel. in pint of water in quart of milk is also good. The addition of Benger's self-digested food is also good for children over 6 months. Same of Nestlé's Food. As children grow older, 1 year, add yolk of egg, or give animal broths, stale bread, rusks, etc. Finely pounded raw beef with all fibrous shreds removed is also good. Let child be daily sent out into fresh air. If feverish, give dose of Ol. Ricini or dose of grey powder, or once a week a saline. As soon as you diagnose rickets begin Cod Liver Oil dr. ss. for children of 1 year. Examine napkins for oil, if present give less dose. Administration can be begun at once. Vin. Fer. dr. 1 T. I. D. is also good in addition, or Quinine. If curds are found in stools give lime water in milk. Saline baths are also good in this feverish state, bathe daily in cold salt water bath. Daily exercise in fresh air is required. Germans recommend Phosphorus, dissolve it in Cod Liver Oil, 3½ oz. oil plus ¼ gr. Phosphorus, apply gentle heat and it dissolves, give regular doses as of oil above. As the children get stronger do not let them

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walk, let them roll on floor. Supports may be needed for limbs. These curves can readily now be rectified by modern surgery.

IX. ANÆMIA.

Hypæmia, too little blood; spanæmia, impoverished blood; anæmia means no blood, so is wrong. Oligocythæmia means paucity of blood cells (aglobulia).

ANÆMIA is divided into : 1. Symptomatic. 2. Idiopathic.

SYMPTOMATIC ANÆMIA.—Histological characters of blood. Red corpuscles may be reduced indefinitely from 5 to 1 to $\frac{1}{2}$ million of red cells in cub. mm. The hæmoglobin is even more deficient than the cells themselves, so iron is deficient; this is especially seen in chlorosis. The white cells, no fixed condition, may be proportionately reduced, may also be increased, varying according to cause of disease, 15,000 to cub. mm. is normal. The microcytes are more abundant in anæmia, frequently may be young cells, or degeneration of red. These (hæmatoblasts) Hayin says are young red cells, so are arrested in development, but increase in numbers and size in recovery. They are only seen in blood at freezing point. In all cases of chronic anæmia the size of red cells is reduced, but this does not determine richness of cell in hæmoglobin. In chlorosis the cells are abnormally small, cells are paler than natural, per cent. hæmoglobin reduced to 85, 66 per cent. of normal. The albuminous contents of blood are also reduced. There is usually a moderate increase in saline matters and water in blood, but there is enough albumen and salts in serum to prevent dissolution of red cells.

THE NAKED EYE CHARACTERS are, it is a lighter, paler color, like claret coagulates slowly and clot is small.

1. PREDISPOSING.—Some are constitutionally predisposed, and slight causes bring it on. They are poor blood makers. May shew itself in red cells, or albumen, etc., being deficient. As a rule well nourished persons make blood readily, but contra is not absolute. Females are more liable than males to this disease, but have a marked power to regain blood, normally their blood is poorer than males. Age influences, anæmia is commoner in infancy, youth and old age. In infancy and youth a drain is set up on the blood to provide for growth and for repair of waste and for conversion of food into tissue. In old age this is not required, waste is not as great, so they can bear impoverished blood better, but as nutritive processes are impaired this impoverished state is induced. Tropical climates favoring inertia and inactivity favor anæmia. 2. Active causes.—Hemorrhages as after labor, at menses, from nose, etc. Repeated loss of albuminous fluid, as leucorrhœa, chronic diarrhœa, chronic albuminuria, all cause it. Rapidly growing tumors living parasite like rot the tissue.

FOOD.—Improper or too little, and associated are residence in dark, damp localities, ill ventilated, etc.

OXYGEN is just as necessary a food as beef or hydrocarbons, hence influences of good or poor air to maintain or destroy.

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MENTAL ANXIETY, severe study, over-work mental or bodily, causing dyspepsia or a too rapid consumption of food. All diseases which lessen desire for food or hinder its assimilation all induce.

FERRILE DISEASES hence induce above, also the demand increased supply of food. Diseases of liver, spleen, lymphatic glands, bone marrow affect blood-making organs. Diseases of mesenteric glands in children prevent passage of chyle into thoracic duct, hence big appetite has no result. High temperature as of extensive burns causes wonderful destruction of red cells.

SPECIAL CONDITIONS OR FORMS.—Conditions which without interfering with digestion, etc., appear to deteriorate the blood. High temperature as from extensive burns is one of such conditions.

BRIGHT'S DISEASE, due to admixture of urea, etc., with the blood.

MALARIA directly destroys the red cells, also other agencies will do the same, as medicinal agents, nitro-benzol, pyrogallie acid, phosphorus, lead, mercury, chlorine, pot chlorate, sulphuric acid, nitrite of amyl, bile acids, etc., also certain mushrooms and certain snake bites.

SYPHILIS is also thought to do the same. All organic diseases of blood-making organs as Hodgkins' disease, leucoeythemia, Addison's disease, etc. Parasitic, as a worm met with in duodenum, common in Egypt, produces a local serious form.

IDIOPATHIC FORMS.—Chlorosis or pernicious anæmia. Sir Henry Clarke claims habitual constipation among women is a cause due to absorption of ptomaine.

SYMPTOMS OF ANÆMIA.—1. Acute anæmia, hemorrhage will be discussed in surgery and midwifery (syncope). 2. Chronic anæmia, general pallor of entire surface of body and visible mucous surfaces.

EYEBALLS glistening white, bluish white or pearl. Want of blood is shown in weakness of muscles, easily fatigued. On heart, walking fast causes palpitation. Cause of muscular weakness is fatty degeneration.

VASCULAR SYSTEM.—Pulse frequent and small, easily compressed, heart's action frequent and weak. There is more or less breathlessness along with palpitation.

AUSCULTATION.—Heart's action is often irregular, signs of dilatation may be found. Apex shoved down, ventricles not completely empty through weakness tend to increase.

HYPERTROPHY is a compensating change following dilatation. On listening you hear distinct murmurs. Haemic murmurs are heard at base, are systolic, are generally soft and low pitched, but may be high pitched. 1. Are heard most frequently at pulmonary cartilage. 2. May be heard louder at 1 to 2 in left of sternum, due to enlargement of left ventricle displacing pulmonary artery. 3. In advanced stages the tricuspid and mitral openings are dilated, giving one or more regurgitations, more commonly tricuspid; if this latter you will hear a murmur down in the stomach, below the 4th rib; if mitral you will hear it below

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4. You often hear a systolic murmur up the aorta. Why is murmur louder at pulmonary cartilage, because artery lies closer to sternum than the aorta is in front.

VENOUS MURMURS.—Besides above you may hear in marked anæmia a murmur in all the large veins of neck, there is a continuous humming sound, best heard in right side of neck over jugular, also in subclavian axillary, femorals, lateral sinns, etc., sometimes. The younger the person the more frequent the venous murmur, in older ones it need to be a marked hum accompanied by other signs of anæmia. Is not heard often.

CAUSES of hum is blood, in passing from a smaller vein to a larger chamber, becomes sonorous, is an eddy, due to either lessened density or lessened quantity of blood. Another evidence in anæmia is coldness of surface, especially of extremities.

THINNESS of blood favors this murmur, also erect posture.

ARTERIAL MURMURS.—Murmurs often heard over large arteries in acute anæmia, rarely in other forms.

DIGESTIVE SYSTEM also suffers, weak digestion, flatulence, muriatic acid deficient in gastric juice.

BOWELS torpid, muscles atonic, bile deficient.

NERVOUS SYSTEM becomes unduly excitable like hysteria, are alluces of exhaustion, nerves of motion and common sensation all suffer. Headache, vertigo, spasm of muscles, chorea, convulsions perhaps, with loss of consciousness, one or more. Pains are felt almost anywhere, but especially in infammatory region in females. Palpitation, spasmodic asthma, cerebral vomiting, etc., may be signs of deficient capacity for mental work.

ORGANS of special sense are disturbed, flashes of light, noises in ears, etc.

SECRECTIONS.—Urine is of low density, pale in color but not invariably; is watery and abundant, is less acid. Skin usually dry, stools dry, nails bloodless hair may become harsh, split. In severe forms hæmic or anæmic fever is not uncommon. The temperature of 101 to 102. Menses generally are scanty and pale, even absent; leucorrhœa is common.

ASSOCIATED DISEASES.—Ulcer of stomach is a common accompaniment in girls up to 25 years, due to thrombosis of some vessels of mucous coat leading to extravasation. The capillaries of gastric vessels are often fatty.

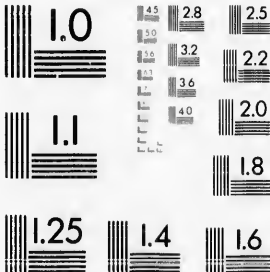
PHTHISIS is an occasional associate. Grave's disease or exophthalmic goitre is nearly always accompanied by anæmia, enlarged eyeballs, thyroid gland and great excitement of heart, is a disease of cervical sympathetic. Degenerations from poor blood, parenchymatous degenerations found all through the body and liver, kidneys, etc. Fatty degeneration, ditto heart, intima of arteries, etc., hence the tendency to hemorrhages. Cause is impaired nutrition. This fatty degeneration of coats of arteries explains hemorrhages due to rupture.

FATTY degenerations of follicles of stomach and intestine interfere with secretions and digestion. Anæmia tends to favor congestion, hemorrhage and occasionally dropsy.



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HEMIC DROPSY affects entire body in time, begins where circulation is feeblest, as at feet, but will gradually affect the whole body.

PROGNOSIS OF ANÆMIA.—If cause is removable cure is easy; if cause is cancer, phthisis, waxy degeneration of liver, glands, etc., is incurable. Death is from gradual and induced asthenia. Syncope. Coagulation of blood in heart or longitudinal sinus may occur (very rare), for impoverished blood favors coagulation; in bad cases relapses are frequent.

TREATMENT—1. Remove cause. 2. Restore the quality of blood. Rest in bed is an important point in the treatment. Find out cause of anæmia, bad feeding discharges, chronic diarrhoea, etc., and combat them, also uterine diseases and over-lactation. An important point is to give rest, bodily and mentally. Mental anxiety is a common cause, and must be removed. Restore quality of blood by, first, food, it should be highly nutritious—meats, especially red meats, all kinds of animal food, you may need to begin with broth and peptonized foods; stimulants may be called for, claret, Burgundy and hock, only natural wines, $\frac{1}{2}$ pint or more may be needed, a stronger wine may be needed. 3. Fresh air and sunshine are necessary, seaside especially good. 4. Remedies—Iron and Arsenic are the chief ones; if patient be feverish, headache, gastric catarrh, give less active preparations of iron, as Citrate, Carb Ferri Redactum, etc. If patient has none of these give more active preparations, as Sulphate and tr. Ferri Perchlor. Dialized iron 10 to 30 grs., not as good as Sulphate, do not give in a mixture, as it decomposes, but prescribe pure thing, 10 to 30 gtt. in water. In some cases you may need to put system in order before giving iron. Give a mineral acid in 5 to 10 m. in a vegetable bitter, as Gentian, Calumba, etc. If patient is prostrate some Ammon. Carb. should be combined. In many cases you may combine iron and bitters. Syr. Ferri Phosph. 1 to 2 drs. is easier way for children. Quin. Sulph. $\frac{1}{4}$ to $\frac{1}{2}$ gr., Sulph. Iron 1 to 2 grs., Sulph. Acid, dil. Q. S. Marked constipation may be symptom. Sulph. Quin. $\frac{1}{2}$ gr., Sulph. Magnes. 15 grs., ulph. Ferri 1 to 2 grs., Sulph. Acid. Q. S. is a good one for iron bitter, and to obviate constipation. A favorite combination is aloes and iron, they mutually help, Pil. Aloes et Ferri 1 to 3 T. I. D. Griffith's mixture equals mis. Ferri Co. 2 drs., Comp. Decoct. Aloes 2 drs., 3 to 4 times per day, is not palatable but is very good. With iron in anæmia the larger the doses the stomach will stand the better. Bellad. is good to accompany iron in pill, overcomes constipation; always give iron on a full stomach, during or after a meal. Many females cannot take iron mixtures, but can take iron mineral waters, chalybeate. Iron may be injected hypodermically. Dr. Ross does not think much of it, as abscess may form and even pyæmia ensue.

ARSENIC is next iron in anæmia. The best way to give is small doses 2 to 4 m. of Liq. Arsenic, increasing 2 gtt. per week till 10 to 12 m. T. I. D. Phosphorus is also used combined with Iron. Ferri Redac 2 grs., Phosphorus 100th to 1-150th gr., Arsenious Acid 1-120th gr. makes a good pill. Easton's Syrup, Phosph. iron, plus Quinine plus Strych., 1 dr. T. I. D., is also good for children.

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X. CHLOROSIS.

IDIOPATHIC FORMS—cannot find cause, seems to be primary disease of blood. Chlorosis and pernicious are the 2 forms under this.

CHLOROSIS most frequent in girls up to 25, even in men and in women even over 50, but as a relapse of chlorosis in girlhood. The victims may have been in apparent good health up to time, or slight symptoms may have been observed previously. Re menses,—it may follow premature appearances of menses, and may cause suppression of ordinary menses; or may not allow of menses until cured, or menses may be normal, so chlorosis is not always due to disordered menses. Sir A. Clarke says this form is due to poisoning by ptomaine due to constipation. The chlorosis at puberty depends on certain conditions—the inability of organism to meet the demands of rapid growth of tissues and the simultaneous occurrence of menses is perhaps the cause, is Dr Howard's opinion. The animal increase of heart and vessels is 8 per cent. per annum up to 13 years, but at 14 this is 80 to 90 per cent., shewing greatly increased tax upon system. 1. If the general nutrition fails from any cause the system will be unable to meet extra demands, and anæmia will result, menses scanty. 2. Or if at this time there is enormous growth of body, then you may have anæmia from overgrowth, perhaps no menses; in such cases mammæ, uterus and ovaries are not well developed. Moral causes, as emotion, grief, home-sickness, etc. may cause. 3. When great growth of fat has taken place leading to misplacement of nutriment results in anæmia and menses abnormal. It may be noticed in a family, several daughters, mother generally has married young.

SYMPTOMS.—1. The color, a sickly greenish yellow white color, no yellowness in eye. 2. A marked tendency to digestive disorders, no appetite, cat slate pencils, chalk, etc., breath generally offensive, constipation alternates with diarrhoea. Ulcerated stomach is common, as vomiting of blood. 3. Nervous disturbances, low spirits, hysteria, etc., may be noticed, eyelids puffy, ankles cedematous, may cause you to suspect Bright's Disease, not so. 4. Blood.—An absence of color in red cells is noticed, red cells reduced, but not greatly in number, 4 to $3\frac{1}{2}$ millions. The great difference between chlorosis and ordinary is the blood not much altered in color except marked deficiency of hæmoglobin. Besides ordinary red cells you find large nucleated colored cells, microcytes, also small deep colored microcytes, also irregularly shaped cells, polykilocytes. These various cells are found in all anæmia, but especially in chlorosis and pernicious form.

TRE TMENT, same as anæmia. Iron in full doses is required, aloes and iron pill T. I. D. is best, helps bowels in their constipation. Some of these cases are curable by Aloes alone, Arsenic not so successful. Leave menses alone till chlorosis is cured, then order exercise, sponge baths, generous diet. Aloes as an emmenagog or electricity to uterus. Sulphur has been said to cure when iron has failed. Salines may be used. Ordinary anæmia does not arise from destruction of red cells (but does in malaria), but rather from deficiency in production, either from fault of blood-forming organs or poor state of blood from defective chylification or from congenital fault.

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X. PERNICIOUS ANÆMIA.

Progressive pernicious anæmia called an idiopathic disease, because the cause is unknown. Some think it is not a primary blood disease.

CAUSES.—Misery, overwork, repeated pregnancy and prolonged diarrhœa; occurs chiefly in middle life, and is commoner in males. This is a rare disease, but causes are common. Symptoms are the symptoms of profound anæmia intensified, patient becomes profoundly weak, progressively and insidiously, pallor is of a yellow lemon tint like mild jaundice, but conjunctiva is white.

ATONIC dyspepsia, no appetite, disgust of food, vomiting, flatulence, perhaps a troublesome diarrhœa; intense headache is a prominent symptom. Urine may be merely anæmic, pale, low density and a low acidity, but may be darker color, excess of urea, uric acid and phosphoric acid. Iron is also increased, test for indican gives strong evidence, sugar is never found, rarely blood or albumen. Hemic fever is apt to be present, as in the other forms; temperature for a week at a time may be at 102 to 104 deg., perhaps lasting several weeks, cause not known.

MORBID ANATOMY.—No lesion found characteristic; fatty changes in heart, vessels, cells, liver and kidneys, etc., are found as in many other diseases is an effect not a cause. Changes in bone marrow, the yellow fat marrow changed to a dull red; appears to be hyperplasia of original bone matter; microscope finds in it a great number of red nucleated cells. It was suggested that this was a lesion to explain the disease. Dr. Howard shewed it was found in various diseases. Leucocythæmia, osteomyelitis, repeated bleedings, diseases attending marasmus so is nature endeavoring to repair the loss, not the cause of disease. Is therefore an effect. Essence of the disease is a destruction of red blood corpuscles in portal circulation, hence changes of spleen and liver. Spleen and lymphatics may be found perfectly normal. Spleen may be found enlarged if a rapid destruction of red cells is going on, but not otherwise. Recent investigation has noticed an excessive deposit of iron pigment in liver, spleen, bone, marrow, sometimes in tubes (cells) of kidneys, etc. Dr. Hunter of Edinburgh thinks liver is the organ of the fault, causing destruction of red cells; he further points out the pigment is found in peripheral cells of each liver lobule. If pigment is in excess it will be found in spleen, kidneys, etc. Chemical analysis shews more iron in liver than in any other disease, so essence of disease is destruction of red cells. Hunter says it is a distinct form of anæmia, and that the essential lesion is destruction, not non-formation of the red cells, and thirdly that it is probably due to ptomaine developed in intestine, and absorbed. Some have thought it is due to a germ, all is hypothetical.

DIAGNOSIS puzzling.—1. If the anæmia has come on gradually. 2. If it progresses to a severe degree in spite of occasional improvement. 3. If no cause can be worked out. 4. If person still retains the adipose tissue, for generally they are fat; person does not emaciate, hence their cachectic look must not be mistaken for malignancy. 4. If instead of white or green tint there is the

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yellow tint. 5. If person has suffered from repeated hemorrhages, as of nose, stomach, bowels, retinae. 6. If blood has following characters: great reduction of blood cells which are very rich in color, especially if the several varieties "macrocyt." etc., are found, white cells are really diminished but relatively are increased. Also Poikilocytes. 7. Schultz's granular masses generally are. 8. Is very apt to be accompanied by hæmic fever. 9 and lastly, its treatment being a failure. Modes of death: 1. Asthenia. 2. Syncope. 3. Apnoea. 4. Some comatose. Pernicious anæmia is nearly always fatal, but sometimes improvement takes place, perhaps permanent.

DIFFERENTIAL DIAGNOSIS.—Leucocythæmia recognized by excess of white cells in blood. Hodgkin's disease (and above too) has enlarged glands and spleen.

TREATMENT.—Iron fails, Arsenic is better, begin with m. 5 T. I. D., increasing every 5 days 1 drop till you are giving 10, 12 to 15 drops. In some cases, stomach tolerates a drop dose hourly, better than T. I. D. doses, increase to 2 drops, etc. If Arsenic fails try Phosphorus, or combine all these. Transfusion is advised when other remedies fail, defibrinate the blood and inject into the arteries. Diet to be nutritious, peptonized food, rectal injections of bullock's blood, an injection of dr. 2 in like of water of common salt restores heart. Subcutaneous injection of defibrinated blood has been recommended, about 2 oz., is not followed by ill effects of fever, etc. Put patient under chloroform, as massage has to be employed to facilitate absorption—is introduced on outside of thigh in 2 to 3 places, or arm. Even injections of milk or beef tea subcutaneously are useful in (all) cases of weakness (pregnancy, etc.).

LEUCOCYTHÆMIA AND HODGKIN'S DISEASE are closely connected to each other and to anæmia.

XII. LEUCOCYTHÆMIA.

White cells of the blood, will be first described. Primarily it is divided into 4 varieties: 1. Splenic, originating in spleen, common. 2. Lymphatic, originating in lymphatic glands. 3. Myelogenic in marrow. 4. Intestinal in lymph follicles of intestines

BLOOD.—There is an excess of white cells, 1 to 50 or 1 to 20 red cells, or even 1 to 1 as many white as red. These white cells are sometimes larger than usual (splenic), or smaller (lymphatic) than normal. Naturally there are 15,000 white cells in cub. mm., but in this disease even 600,000 in cub. mm. have been seen. Red cells are less in number than normal, and red nucleated cells are also seen, also microcytes, poikilocytes, but not as many as in pernicious anæmia. Schultz's granular masses are found even 1 to 500 in diameter. There is no constant alteration in albumen, fibrin or salts of blood, fat is often increased, frequently hypoxanthin, uric acid, leucen, gluten and others are found. And after death, Chareot's crystals are found in blood. Naked eye characters shew blood paler, more liquid. If defibrinated and let stand there will be a greyish layer above the red layer of leucocytes (buffy coat).

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SYMPTOMS.—Comes in insidiously, perhaps fullness of epigastric region first symptom. On examination spleen will be found enlarged, is early, liver is frequently enlarged also. Sometimes there is pain across here. Paleness of surface, all the symptoms of anaemia, loss of strength, breathlessness, palpitation, hemorrhages especially, dropsy (passive). Fever is not usually present in chronic forms, but is in advanced chronic and acute forms. Color of skin has a yellowish tint owing to destruction of red cells, etc. In rarer forms enlargement of lymphatic glands is seen beginning in neck, groin, axilla, etc., rarely reach larger size. In myelogenous form, there is distinct pain in the bone (usually sternum) or long bones, but pain may be absent. Urine at first usual quantity of urea, but there is always excess of uric acid. No albumen, but hypoxanthin, etc., are found. Urine is of high sp. gr. Retinal hemorrhages are frequent, with white lines in course of vessels.

DURATION OF DISEASE varies from 6 months to 6 to 7 years, average is 2 years. This disease is always fatal. Modes of death are various. 1. Hemorrhage, vomiting and epistaxis. 2. Haemic dropsy from this state of blood. 3. Syncope, asthenic or fatty heart, or by 4. Simple asthenia, die comatose. 5. Diarrhoea uncontrollable. 6. Pressure of glands. Complications are dropsy, oedema of lungs, dilatation of heart, thrombosis of veins, cerebral hemorrhage.

MORBID ANATOMY.—Lesions divided into primary and secondary. Primary affect spleen, lymph glands, marrow of bones, and perhaps intestinal lymph follicles. Secondary lesions are partly due to accumulation of white cells in vessels and their infiltration into surrounding tissues, also by hypertrophy of the gland tissue which exists everywhere.

SPLEEN is found considerably enlarged from 7 to 8 oz. normal to 7 to 8 lbs., capsule is thickened, is due to hyperplasia of the splenic pulp. Malpighian corpuscles not affected. Frequently white patches of accumulated cells are found mottling cut surface. The liver also may be enlarged to 5 to 10 lbs. Left lobe oftener attacked. Cut surface has irregular white surface about lobules.

KIDNEYS have also been found enlarged by leucæmic neoplasms.

LYMPHATIC GLANDS undergo hyperplasia, tissue is loaded with young lymphatic cells, hence source of leucocytes.

BONE MARROW.—Especially in spongy bone tissue. The marrow is hyperplastic, color grey or greyish yellow, or yellow, sometimes is greyish red. Lymphatic tissue replacing the marrow.

INTESTINAL GLANDS.—In a few instances the lymph follicles from stomach down to large intestines are found enlarged, also the more diffuse adenoid tissue of this region; the enlargement of some parts may take the form of sessile growths, as large even as a foetal head. The ileocaecal valve may be so thickened by adenoid growth as to absolutely obstruct. All the other organs of the body may enlarge, owing either to mere accumulation of white cells in their vessels or infiltrated into their tissues, or from overgrowth of their adenoid tissue. May be from escape of leucocytes from blood into tissues and their multiplication there by fission.

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CAUSES.—Obscure, not known. Men suffer 2 to 1 woman (of primarily splenic form). Is most frequent from 20 to 50 and most common though in old age. Has occurred in childhood, is rare in females after 30. It has been referred to syphilis, ague, etc. Not so with syphilis, but ague is a cause. Splenic tumor originating in ague has become leucocythæmic. It has at once followed ague. Menstrual disorders seem to have an influence, ditto pregnancy. There is no hereditary transmission. The lymphatic form has followed cold and wet, a chill. The bone form has followed injury to the bones. As a general rule no cause exciting or predisposing can be definitely said to exist.

PATHOLOGY.—Some think the hyperplasia of blood-forming organs is the primary cause of white cells predominance. But how about want of red cells? Virchow there says disease is due to non-transformation of white cells into red cells, hence lack of red cells. What sets up hyperplasia and prevents conversion into red cells is not explained. Cases are recorded in which no lesions are found, so some think the hyperplasia destruction of red cells, etc., is a consequence of the disease. Some propose a germ theory. In Hodgkin's disease the same lesions are found without leucæmia, that is deficiency in red but no increase in white cells.

TREATMENT OF LEUCOCYTHEMIA.—Find an exciting cause and endeavor to remove it. It is seldom you can find cause. Inquire into malarial history, if it were present then treat with Quinine, treat enlarged spleen as you would ague cake. Cod Liver Oil has in some cases been found good to keep up nutrition. Iron and Arsenic have entirely failed. Pot. Iodid. has no effect, ditto mineral acids and Phosphorus. In fact, no cure has been found. Retardation by iodiform has occurred also from employment of constant current. Transfusion of blood has no benefit, has been followed by death, due to transfusion. Injection of defibrinated blood subcutaneously may be tried, or transfusion from artery to artery. Excision of spleen has failed to give benefit.

XIII. HODGKIN'S DISEASE.

HODGKIN'S DISEASE (progressive multiple hypertrophy of the glands) or Pseudo-Leucæmia, or Lympho Sarcoma applied to soft variety, Adanæmia, etc.

SYMPTOMS.—Progressive and occasionally rapid growth of the lymphatic glands of body. Rarely disease originates with splenic enlargement, but it is seldom much enlarged, or mesenteric glandular enlargement. When glands become enlarged there is slow loss of strength, marked anæmia generally, but not an early symptom. The diseased glands form round elastic tumors not adherent to skin, after awhile when larger they may fuse; glands in axilla may weigh 1 to 2 pounds. Glands are not as hard as in cancer generally, but one variety as hard glands from interstitial growth. These glands have no tendency to suppurate, but keep growing. In about 80 per cent. of cases spleen finally enlarges, and liver afterwards, also kidney. Resemblance to leucæmia is that wherever these

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glands exist they are affected, ovaries, testes, brain, bones, etc., and these secondary growths are in two forms, isolated and infiltration. Glands first affected are cervical, the axillary next and then inguinal. The bronchial glands sometimes become involved, penetrate the lungs. It invades thymus gland, invading mediastrum, and grows perhaps right through ribs, by infiltration. This tendency to infiltration is in the soft variety. Cervical and axillary glands externally and bronchial internally are the favorites for attack. The retro-peritoneal glands occasionally form tumors and pressing various structures. The mesenteric glands also sometimes form large tumors. As disease advances well marked fever is seen, chills, heavy perspirations. When fever is present case is more rapid, prostration greater and profound anæmia well marked.

THE BLOOD is essentially same as in leucocythæmia, except no increase in white cells. The red cells are reduced in numbers to 2 to 2½ millions per cub. m.m., poikilocytes rare, microcytes common. The white cells are generally not much increased. Schultz's granular masses are in variable numbers, and the nucleated red capsules are not seen. Dr. Pye Smith says the inflammation around the glands keeps increase of white cells down; Dr. Howard does not believe this.

MORBID ANATOMY.—1. The process consists in a hyperplasia of lymphatic tissue wherever it exists, also of thymus gland. 2. Spleen. 3. Bone Marrow. 4. There is also a formation of lymphoid growths in viscera. 5. There is an infiltration of the tissues by the lymphoid growths. The proper lymphatic glands suffer first and mainly, but the spleen seldom escapes, it seldom attains size attained in leucæmia; if it is found enlarged you will find isolated grey white tumors in the spleen, also in the liver, made up entirely of lymphoid elements, same also is seen in kidney. The medulla of the bones presents a hyperplasia of its elements, conversion of red marrow into greyish white growth. There are two varieties of growth: 1, Hard, and 2, Soft. The soft variety is composed of lymphoid elements alone, and this kind is it which infiltrates while the hard form gives distinct masses.

CAUSES, not transmissible, males have it more than females, age 26th to 35th year, but both younger and older ages have it. Not directly connected with scrofula, but distinction not marked clearly. Twice at least it has been found with tubercle, has also been found with syphilis (a coincidence). Ague has preceded it in four cases, whooping cough in two coincidences. In a few instances local irritation has started the process. Is common among French soldiers (high collars). Exposure to cold has preceded it, sore throat, etc., all seem coincidences, and slight causes above seem only to have acted in a latent predisposition.

PROGNOSIS highly unfavorable, always die of the disease or the complications, due to pressure of enlarged glands on various organs.

DURATION,—rapid course, may be (rare) 2 to 6 months, more frequently it lasts 2 to 3 years. More protracted cases have occurred.

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DIFF. DIAGNOSIS OF CANCER OF GLANDS of neck. In cancer the glands are harder, adhering together, more apt to adhere to skin, are generally tender, seat of pain, are usually attached to deep tissues, and hence immovable. Again, cancer of these glands is always secondary to primary cancer, as of tongue, breast, etc. Again, with cancer spleen is not enlarged, nor does the disease affect all glands of body at once, no symmetry. Blood changes are not the same, etc.

TREATMENT.—Extirpation of glands is always too late, external glands may be removed, but internal glands most likely will be affected. Application of electricity, injection of Iodine and Arsenic have all failed, rubbing in of iodol form ointment has failed. Arsenic in increasing doses is hopefully spoken of by Billroth; begin with 5 drops per day, gradually getting up to 20, 30 to 40 drops. Push treatment steadily. Iodide of iron has failed, rubbing and champing the glands, or douching by hot and cold water alternately have all been tried, also pressure and blistering, but all fail. The anæmia calls for iron and generous diet.

PARTIAL VARIETIES OF LYMPHADENOMA.—Simple hypertrophy of a gland, benign not involving other glands, is lymphoma. There is also a malignant lymphoma, sarcomatous, spreads to contiguous structure, may be conveyed by metastasis to other parts.

XIV. ADDISON'S DISEASE.

Addison's disease of suprarenal capsules is accompanied by profound anæmia.

SYMPTOMS.—1. Marked anæmia leading to. 2. Profound asthenia, gradually induced; loss of strength is one of first symptoms, great languor, listlessness, face expresses it, heart's action is very feeble, palpitation of heart, sighing, yawning, etc. There may be pain in lumbar region. There is no wasting, temperature generally subnormal, extremities cold, tongue remains clean generally, there may be nervous symptoms, as numbness, dimness of sight, etc. 3. Marked digestive disturbance, disgust for food, frequent vomiting, this is a marked feature; on careful examination you find no enlargement; in some instances phthisis or vertebral caries has been present, spleen generally enlarged, pain often on pressure of abdomen. 4. Bronzing of skin comes on gradually, mulatto color (yellowish brown), most marked where pigments most abound, axilla, groin, linea alba—discoloration is darkest in parts most exposed to light and where pigment is natural—palms and soles, roots of nails escape bronzing. In mouth along inner margin of lips, etc., patches of mulberry color are seen, tongue also along its free margin is stained, conjunctivæ always remain normal, the bronzing may resemble putty, rises versicolor. This discoloration is late to come on.

DURATION of disease is generally $1\frac{1}{2}$ years, may cure in 6 months or not until 4 years. It is common in years of adult life, from 10 to 50, commoner in male than female sex.

MORBID ANATOMY.—Perhaps only enlargement of suprarenal capsules, translucent in early stages, turning grey perhaps with caseous or earthy matter; in early stages capsules are enlarged and heavy, dividing line between cortex and

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medulla is lost. A little later the semi-translucent surface gets marbled by fatty degeneration and fibroid change. The fibroid change goes on and decreases in size. The fatty degenerations are absorbed. In last stage capsules are nodular and irregular, puckered, in all cases but 4, in 128 both capsules were affected. Cancerous disease does not produce the discoloration. The capsule is firmly adherent to surrounding tissues, to splanchnic nerves and solar plexus, and some think this is cause of severe trouble, these are the only nervous lesions known. Tubercular disease of lungs is not uncommon with this disease. More rarely enlargement of some of the glands is found, liver and spleen, mesenteric glands, etc., but none are characteristic. Liver and spleen are often enlarged. Anæmia is one of first symptoms, blood is never so altered as in profound anæmia, that is, thin, watery and light in color. Cases of Addison's disease without bronzing are recorded. There are remissions in the symptoms occasionally, patient gets stronger; there are even remissions in the pigmentations, it getting less. In late stages asthenia is profound, and sudden death from syncope is common from weak heart, etc. In intestines there is generally found signs of intestinal catarrh, with enlargement of solitary follicles.

CAUSATION.—It is not inherited, but often is associated with inherited diseases, as tubercle; it has followed a blow or fall.

PATHOLOGY.—Addison's theory that suppression of suprarenal capsule is cause may prove correct, yet destruction of these glands by cancer does not give symptoms of Addison's. Myxœdema follows removal of thyroid glands, so why should not interference with suprarenal capsules also affect constitution? Another theory is the disease of capsules and adjacent glands pressing on and involving the semi-lunar ganglia, and solar plexus sets up nervous changes leading to symptoms of this disease. Induration above pancreas, aortic aneurism, pressing on these nerve structures, has been found in Addison's disease, hence favoring this pressure theory, but the disease has been found when these nerves have not been affected.

DIAGNOSIS.—Other discolorations of skin must be eliminated, sunburning, exposure to weather and dirt, pigmentation of pregnancy, or of chronic uterine disease, chronic malaria causes pigmentation, pityriasis versicolor or nigra, melanotic cancer. In nearly all these cases the color is in patches, but in Addison's disease the discoloration affects the whole body, although darker in natural situations of pigment.

TREATMENT.—Is incurable. Anæmia calls for hæmatinics, asthenia for careful treating and stimulants, vomiting may call for peptonized food, either through mouth or rectum. Hence rest is important to guard against sudden death—longitudinal position should be maintained in late stages.

LOCAL DISEASES.—Kidneys, lungs, heart and viscera.

XV. BRIGHT'S DISEASE.

BRIGHT'S DISEASE divided clinically into 4 forms: 1. Acute parenchymatous nephritis, involving the parenchyma principally. 2. Chronic parenchy-

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matous nephritis, either primary or secondary to an acute stage. 3. Chronic interstitial nephritis (cirrhotic), because interstitial substance is affected. 4. Amyloid degeneration (waxy kidney). Origin of first 3 forms. These 3 are of inflammatory origin and they are diffuse in their characters, tending to involve all the structures while predominating in one tissue. No rigid division can be made.

ACUTE PARENCHYMATOUS NEPHRITIS most frequently begins in the Malpighian tufts, also in tubules, giving glomerulitis or tubularitis. 1. That affecting the tubules (renal bronchitis) or acute catarrhal nephritis. In milder forms at first kidney is not much enlarged, a little thicker and rounder and heavier, but not much. On incision cortex is swollen and congested, capsule is easily torn off. Under microscope the epithelium of tubules is found to undergo cloudy or granular degeneration, the lumen of some may be found narrowed by swelling of the epithelium, and some of the detached cells may block others up. The cells are enlarged mainly by growth of their articular structure and to imbibition. In a more severe form alterations are greater, kidney is distinctly enlarged, heavier, capsule tense, peels readily, outer surface of kidney darker, and on incision the color is redder, pyramids deeper stained than usual, organ looks coarse, the striation is marked with lines of tubules filled with inflammatory products. Color varies though with severity of inflammation, being brown, red, yellow, etc. As early stage of congestion is over, the kidney becomes clearer, due to accumulation of inflammatory products in tubules. Under microscope some granular degeneration of epithelial cells is seen, the lumen contains granular debris. Shed epithelium and effused blood, blood cells, etc. Resolution as a rule takes place, inflammatory products absorbed, balance washed out. But often this does not occur, then leucocytes escape into connective tissue; this last proliferates, embryonic tissue forms, changes to fibrous, and thus the interstitial inflammation begins, kidney is firm now. The connective tissue growth gives rise to the large white kidney (chronic).

GLOMERULAR FORM.—In a great many cases, the disease starts from the capsule of glomeruli. This is noted in scarlet fever, causing glomerulitis. Process may be very slight, naked eye shows no change, but microscope shews an exudation of albumen within capsule around the top. In more severe cases the kidney becomes swollen, capsule tense. The epithelium covering top may be shed, tuft perhaps shrivelled, or these glomeruli may become transparent homogenous masses, larger than usual; in other cases a cloudy swelling, granular degeneration and desquamation of epithelium of tuft is seen, also a similar change to epithelium of capsule. A large growth of young cells may occur within the capsule, compressing the tuft and stopping circulation. Hemorrhage into capsule often occurs, compressing tuft. All this time little change has occurred in tubules, although it tends to spread to them. Casts will always be found in the tubules of an albuminous exudation. Naked eye appearances of kidney not striking, congestion of cortex and where cortex joins pyramids, but not between. In more advanced stages, congestion passes off and exudation takes its place. Later

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changes, when disease is chronic and interstitial growth has occurred. In both glomerulitis and toxaemic nephritis there is a certain escape of leucocytes into interstitial tissue. In chronic stage kidney is twice as large as normal, white or yellow, smooth, capsule easily torn off, stellate groups of vessels are seen on surface. On incision a general pallor even of the pyramids is noticed, due to want of blood. The cortex is distinctly thickened (connective tissue formation), white lines of tubules distended with inflammatory products, also yellow spots where these products have undergone fatty degeneration. Under microscope the tubules are engorged with unhealthy products. The interstitial tissue is also thickened and Malpighian tufts atrophied, swollen or undergoing various changes. If this patient lives longer than you expect, a granular change sets in, yellow large granulations are found on the surface, capsule is adherent, kidney is tough and atrophied, is not often seen, is 3rd stage, is reduced in size from large kidney, but will still be larger than normal kidney—the granulations are yellow, for epithelium of tubules which form them are fatty—kidney is white. The tubes generally through the kidney are damaged by fatty degeneration of the epithelium, nor are cysts so common in the atrophied form. The appearances of the kidney must depend on the stage to which the process has attained. Kidney vascular in first stages, blocked with inflammatory products in later stages, and then white, and in intermediate stages it may be mottled, congested in spots and white in spots.

CLINICAL SYMPTOMS.—Acute parenchymatous nephritis occurs most commonly after scarlet fever, 14 to 15 days after desquamation or after a cold; in first stages there is fever 101 to 103 deg., pulse rapid and tense; in severe cases there will be headache, vomiting and diarrhoea.

URÆMIC SYMPTOMS.—Convulsions and coma. Dropsy may come on very suddenly, acute anasarca, there is generally ascites added. Urine is diagnostic, frequent desire, is scanty, sometimes suppressed, is of high density—1020 to 1030, is highly acid, color reddish brown, sometimes red, due to presence of blood; if allowed to stand, a thick, turbid beef-tea deposit occurs. On testing a large deposit, $1\frac{1}{2}$ per cent. of albumen is found, there is a deficiency of urea, it being retained in blood, and chlorides are also largely deficient; under microscope are found tube casts moulded in tubules, are epithelial, hyaline blood casts. In later stages we often find larger casts granular, deprived of epithelium. You will also find blood corpuscles, broken down epithelial cells, debris. In mild cases you have no fever, dropsy sets in more gradually, uræmic symptoms do not occur so early, no vomiting, no suppression of urine. This latter form is more common than the acute form. There will be less blood in the mild forms, otherwise urine will be the same.

COURSE OF ACUTE FORM as after scarlet fever, symptoms subside in 3 to 4 weeks, urine more copious, dropsy disappearing, etc. In some cases this disease lasts 3 to 4 months, and may end all right, but it threatens to become chronic; if it lasts 5 to 6 months it is passing into chronic form, and death will probably occur

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in 12 months. A few cases lasting 2 to 3 years are recorded. When scarlatinal nephritis in children is fatal it occurs generally in first month, few surviving 3, to 5 months. The tendency of this acute form is to recovery, only occasionally becoming chronic.

DIAGNOSIS OF CHRONIC PARENCHYMATOUS NEPHRITIS.—May occur as a sequel of acute form, or may be primary. These persons when first seen are pale anemic and weak, and are dropsical. The great symptoms, in only 2 per cent. is dropsy absent. Urine is scantier than it ought to be, its density is high, albumen may be as high as 5 per cent., color will be darker and nearly always turbid, on standing it deposits a beef tea deposit, a dark tinge (brown or red) from blood may be seen in some cases, urea is also diminished 250 grs. Under microscope casts are present, but only a few are epithelial casts, as most of epithelium has been shed; there may be no blood casts; the other casts hyaline, especially granular, dark and light, some of these shewing oil globules, due to fatty degeneration, the more chronic the surer you will find fat. The size of casts varies—some very large, for tubules may be deprived of lining, hence are larger; debris of broken down epithelium, fragments of casts, of red cells or leucocytes, etc.

HISTORY is, patient has been ill at some time, has frequent micturition now even during night; if man were strong before attack the pulse may be tense, dilatation of left ventricle with a little outward and downward displacement of apex, but if weak these signs may not shew. Uremic symptoms are common,—vomiting, diarrhoea, severe headache, or even convulsions and coma, these last are more rare than in acute form; symptoms may be as though patient were half drunk, coma (dead drunk) supervening. Albuminuric retinitis sometimes is seen. Patient is specially liable to secondary inflammations, as of pleura, heart, etc. He is less liable than in acute but more than the cirrhotic form to uremic symptoms.

CAUSE of Chronic Parenchymatous Nephritis: 1, generally after scarlet fever; or 2, after exposure to cold, especially after cold and scarlatina; 3, after malaria; or 4, after acute rheumatism; or 5, after pregnancy; 6, after protracted suppuration. It is rare to meet it after diphtheria or cholera.

CAUSES of acute form: age—more common in young, 23 years average, is rare after 50. Sex—more frequent in males.

PARASITIC diseases or morbid poisons, nearly all these diseases may cause this disease. The micro-organisms may merely act as emboli producing infarcts, or they may act as local irritants setting up Par. Nephritis. A few of the chief diseases are: 1, scarlatina; 2, diphtheria; 3, cholera; 4, measles and small-pox occasionally; 5, surgical fevers as erysipelas; 6, relapsing fever; 7, acute rheumatism, rarely; 8, infectious pneumonia; 9, ulcerative endocarditis; 10, syphilis; 11, tuberculosis (amyloid). You can call above Infective or Parasitic Nephritis. There are also toxic causes, as Chronic Suppuration (amyloid), agents acting as local irritation, Cantharides Turps, Balsams (Copaliba), Oil of Sandal Wood, Pyrogallie or Chrysophanic acids, Phosphorus, bile acids, also alka-

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hoids of the body self-generated "ptomaines." Sugar of Diabetes sometimes causes Acute Nephritis. A third group of causes, obscure, as cold, repeated exposures to cold and damp, burns extensive, acting reflexly, extensive eczema ditto, also pregnancy, usually acute, transient form. How does pregnancy do this? Pressure on renal vessels leading to congestion, also to increased tension of vascular system, and lastly the extra work of excretion of effete matter.

CHRONIC INTERSTITIAL NEPHRITIS.—Cirrhotic or fibroid kidney, or chronic induration of the kidney. The inflammation involves principally the interstitial tissue, and the parenchyma secondarily. In earliest stage the connective tissue of cortex is proliferating, a migration of leucocytes and formation of new fibrous tissue around the Malphigian capsules—this by contraction leads to puckering and atrophy of organ. At a later stage the epithelium of the Malphigian body proliferates, so it becomes a transparent hyaline body, or undergoing fibroid changes withers—either change impedes function of the Malphigian body. An exudation may take place into the capsule. The blood vessels also suffer, the arteritis extends to all the coats, walls so thicken as to sometimes obliterate the lumen, called arteritis obliterans. Some pathologists think the disease starts in the arteries, as an endarteritis, and extends to the connective tissue. The tubules also suffer the same changes—some remain healthy, many atrophy—epithelium degenerates and is stripped from them—the others contain fatty epithelium. Charcot believes some of epithelium lining tubules proliferates and changes to fibrous tissue. A variety of cirrhosis of kidney, in old age. Arterial cirrhotic contraction of kidney needs to be distinguished, due to narrowing and obliterating of the arteries, hence atrophy. This form is known by the fact, the microscope will discover no new connective tissue. This gives smallest kidney known. To return to Caron. Interstit. Nephritis: Naked eye appearances—both size and weight may be reduced, capsule is much thickened and adherent, surface of kidney is granular, coarse or fine, color of kidney varies, red, greyish red, pale, etc., amount of blood or fat accounts for color. On section the same wasted appearance, cortex is narrowed, pyramids approach near to surface, and are pale, cicatrices of cysts of all sizes may be seen on surface. Cysts consist either of dilated Malphigian capsules or dilatation of tubules by their own products. These cysts abound in the interstitial nephritis, but are rare in parenchymatous nephritis, so in interstitial nephritis we have hypertrophy of matrix, wasting of parenchyma.

CLINICAL SYMPTOMS.—It is very insidious, so patient does not come for advice till symptoms are advanced, and generally disturbance of nervous system brings him. There is reason to believe there is functional stage which preceded, this stage is dyspepsia, constipation, headache, affections of pharynx and larynx, evidences of arterial tension, etc. These symptoms after prevailing for some time result in Bright's Disease. Pain in region of kidneys is not constant, rare to have pain. First symptom may be frequent micturition, getting up at night. Patients are at first well nourished, go about their work, etc. Dropsy may be entirely

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absent from this disease, and if present is generally slight—lids of eyes in a. m. ankles at night. May be palpitation and dyspnoea. Dyspepsia is a very common complaint. Dropsy is generally a late symptom, and is generally due to mitral disease or effusion into cavity of chest, thus interfering with circulation, but in final stage from weakness of heart we do get dropsy.

URINE is abundant, 4, 5 to 6 pints per 24 hours, is of low density—1007 to 1010 to 1014, pale in color and almost free from deposit. In the slight deposit you may find tube casts, but they are absent for a long time; the first ones are slender, hyaline then perhaps a few broad granular casts or waxy. Albumen is often absent at first, but usually does appear, is small in amount—will sometimes be absent in a. m. but present after a meal or exercise—examine repeatedly for it. The amount lost daily is small, 15 grs. per diem. Solids of urine, the per cent. of urea is small per specimen, but as urine is in excess it is found the per cent. of urea is about normal, hence this form does not kill rapidly. As disease advances this elimination of urea diminishes, and urea has then been detected in the blood.

HYPERTROPHY OF LEFT VENTRICLE, without any valvular disease, is symptomatic, occurs in 50 per cent. of cases. In old persons if they have not had rheumatism, then hypertrophy indicates Bright's Disease. High arterial tension is a symptom. To recognize: 1, the sphygmograph may be used; 2, by characters of pulse under fingers; 3, heart—pulse is slow or persistent (not meaning rate), sometimes feels corded, if you will finger across it feels thick. If you obliterate the pulsation a finger below will feel the thickened vessel, for the coats of arteries are hypertrophied. With the sphygmograph the preliotic wave is more marked. Heart evidences left ventricle is hypertrophied, and apex may be out and down a little, the impulse to hand will be stronger. Accentuation of second sound in aorta will be noticed owing to greater tension causing abrupt recoil on the valves, and sometimes in marked cases there may be reduplication of first sound, or at least prolongation. Cardiac murmurs may be due to dilatation of aorta from tension, hence regurgitation—may be also due to atheroma of valves, etc. Atheroma of arteries is also common, an effect of this disease, due to increased strain on arteries inducing arteritis, hence the atheroma. This atheroma accounts for hemorrhages, epistaxis; always suspect a man over 50 who has nose bleeding, as he may have Bright's Disease. It may be hemorrhage into stomach, etc., but is often into brain, hence death. Hemorrhage into brain and Bright's Disease in 95 per cent. go together—apoplexy—means look at kidneys

URÆMIC SYMPTOMS.—Vomiting, usually in morning while fasting, fluid is watery, acid, may contain urea—diarrhoea intractable, profuse and serous. Obstinate headache may accompany uræmic vomiting, amaurosis transient, abiding dyspnoea, attacks of asthenia, due to uræmia or weak heart. Cheynes-Stokes respiration, itching of skin rare, muscular convulsions, tremors, twitchings, etc., or more commonly a semi coma, apathy, listlessness, may pass into coma. A permanent impairment of vision, albuminuric retinitis, white patches on retina. Bronchitis common to this form and large white kidney. Pericarditis is more frequent

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DURATION AND TERMINATION—Duration indefinite as you cannot get a starting point, may last several years, 2 to 10. More frequent causes of death are: 1, apoplexy; 2, uræmic convulsions or coma; 3, inflammation of lungs or some serous membrane; 4, erysipelas.

CAUSES OF CHRONIC INTERSTITIAL NEPHRITIS.—Age—is a disease of advanced life, 50 and up, but may occur younger. Sex—twice as frequent in males. Climate—especially common in changeable temperate climates. Exciting causes—pregnancy produces other kinds, but perhaps not this disease, same with cardiac disease, rather cyanotic kidney they produce. Gout and lead are well known to produce this affection, lead causes gout often. The uric acid secretion of kidney in gout and lead poisoning is noted, may be cause of the disease. Charcot thinks lead acts as irritant, causing proliferation of the interstitial fibrous tissue. Dyspepsia and over eating—persons who are large eaters develop this form of Bright's, ditto certain forms of dyspepsia. Reason is such kidneys have more work of elimination than normal, more urates, phosphates or oxalates are to be eliminated, and in so being cast out they irritate the kidney tissue. Pto-maines also from intestinal canal may locally irritate the kidney tissues. Syphilis as a cause is not proved. Mental anxiety is thought to be a cause of this disease, no proof of direct action, but by interfering with digestion setting up dyspepsia, hence causing, for dyspepsia produces a lot of effete matters to be got rid of. Malaria chronic does seem to be occasionally a producer of this affection. Those conditions of bladder, urethra, which interfere with voiding of urine, or flow from kidney, as stricture, cystitis, tumor of uterus, pyelitis, etc., occasionally produce this disease. Usually they produce "surgical kidney," but sometimes this form (not suppurating) an "ascending nephritis." Alcoholism is also recognized as a cause. Chronic gonorrhœa by causing cystitis and hence pyelitis, so an ascending nephritis may also be a cause. Amyloid degeneration inherited. Disease may be inherited probably through gout, a grandmother mother and two of her brothers died of it. Chronic rheumatoid arthritis occasionally causes it; syphilis is said also to do so, but not proved.

AMYLOID DEGENERATION—also called lardaceous kidney, or bacony kidney waxy kidney, albuminoid degeneration, suppurative degeneration, etc. Development—disease begins in arteries of Malpighian tufts, these tufts become hyaline, enlarged, glistening, and are now impermeable. This process extends to both afferent and efferent vessels of tuft, then basement membrane of tubules becomes affected, then epithelium of tubule, of capsule and of glomerulus undergoes fatty degeneration, then an infiltration of leucocytes of proliferation of fibrous tissue occurs, kidney becomes enlarged and hardened. Naked eye appearances: In first stage little is noticed. On section a skilled examiner can see glistening bodies, like boiled sago granules. These are the hyaline Malpighian bodies. Add Iodine, and these become brown. In a later stage the kidney is enlarged by growth of

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this fibrous tissue, kidney is pale, yellow if fatty, or pale pink. Capsule easily torn off, but in late stages is thickened and slightly adherent, cortex pale, brush over with Iodine and you get brown staining. Surface is smooth, but granular; kidneys may weigh as high as 10 oz., hard, easily cut into thin slices, are semi-translucent. A third stage is the contracted stage, although this view is not accepted, and that kidneys so found are amyloid degenerations of other forms, as cirrhotic kidney. Tests for amyloid kidney: 1, Tr. Iodine is rough test; 2, apply a solution of Methyl violet, gives a red violet to amyloid part, & blue violet is given healthy parts; 3, Sulphate of Indigo stains the amyloid tissue blue permanently, the healthy tissue finally gets green. This amyloid kidney is slow to decompose.

CLINICAL SYMPTOMS.—First, patient is out of health, frequent micturition, urine 4, 5 to 6 pints, increased flow, is pale and of low density, 1012 down, deposits a moderate white sediment. This on examination shews casts frequently, usually are hyaline, and shew fat globules. At times granular casts are round and rarely amyloid casts (test). Albumen is sometimes absent, or occurs as mere trace at first, but once it appears it persists, perhaps 300 grs. per day is so lost, quite a quantity. Urea is about normal, although any specimens may not shew much, still urine is in excess. Globulin is pp. by Epsom salts, casts and blood also present accompanying the albumen. Dropsy is often a late symptom, occurs in belly, etc. Often where it sets in is acute nephritis setting in. Diarrhoea, watery, is also common, Vomiting also. These two are due, as pathologists say, to amyloid change of villi of intestines and mucous membrane of stomach. This amyloid change also frequently attacks liver, spleen and lymphatic glands. Complexion usually is of great pallor—anaemic. Inflammation of lungs or serous membranes is a common tendency, but no tendency to bronchitis, but has a marked tendency to thrombosis. Coma and convulsions are not as common as in other forms, as urea is excreted. Little tendency to hypertrophy of heart, atheroma of blood vessels or apoplexy. Disease is apt to be fatal. Death perhaps by intercurrent disease.

CAUSES.—Found almost invariably in cachexia brought about by chronic suppurating disease, as of bones, syphilis, caries of spine. That is reason to excise suppurating joint, etc. But syphilis causes it without suppurating. It may be a sequence from loss of albumen from some other disease of kidney. Cancer growing rapidly may produce it, malaria chronic also causes it, chronic dysentery may cause. The time which will elapse between suppuration and amyloid degeneration will depend on the height of the fever which hastens, prolonged fever also causes it. The shortest period on record is $2\frac{1}{2}$ months. Nature of amyloid degeneration is not known, some think it a second stage of hyaline degeneration, but not likely, as hyaline is sequel often of small kidney (interstit.), amyloid is sequel of white kidney, large. Amyloid degeneration is not always progressive, recoveries have taken place, especially when syphilis is the cause, a fatty or molecular breaking down of amyloid matter occurring.

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SURGICAL KIDNEY—Suppurative Nephritis.—Minute abscesses are formed in all parts of kidney, especially about glomeruli from retention of decomposition of urine in kidney. Symptoms are due to absorption of N. H., hence ammoniacal state of breath, sweat, urine, a dry condition of mouth and tongue; vomiting and purging may occur in acute cases, absent always in chronic cases; as patient gets worse, severe nervous symptoms are seen, delirium, etc.; case resembles pyæmia in chills, etc., but no metastatic abscesses. Prognosis: almost always fatal—inside of 3 weeks from beginning; recovery may take place if only one kidney be involved; hard to diagnose. This disease cannot always be diagnosed, for it is secondary to bladder troubles, etc. To determine, it is important to get specimen of urine as it comes from kidney, hence wash out bladder carefully, and leave in soft catheter, and so gather urine as it trickles down. Treatment: medical is no good. Prevention is better than cure. It is due to air contamination of urine, so treat bladder antiseptically.

COMMON SYMPTOMS of Bright's disease, affecting all forms. Albumen in urine is one of most reliable signs of kidney disease, of Bright's in part. Causes are two—organic and functional. Organic may be in kidney (renal), or out of kidney (extra renal). Renal causes are chiefly the several forms: 1. Of Bright's disease. 2. The cyanotic indurated state (cardiac). 3. Parenchymatous degeneration arising especially from fevers. 4. Nephritis from parasites, new growths or infiltrations. Extra renal albuminuria. Causes: When pus escapes from genito-urinary tract or neighborhood into urine as cystitis, prostatic abscess, renal calculus, hemorrhage, latter causing blood in urine. But albumen may be absent in Bright's disease for some time. Usually appears. If albumen be mixed with pus, the amount of albumen will be small. The microscope will shew the pus cells. There will be an absence of tube casts if Bright's be absent. History might shew source of pus. Blood in urine, there would be absence of casts, small proportion of albumen, red blood cells. History would exclude Bright's. Tests for albumen—2 good. Nitric acid and heat are good practical tests. Nitric acid. Add $\frac{1}{4}$ nitric acid to urine, causes a white cloud, thicker in proportion to amount of albumen, settles as deposit. Sometimes the acid pps. uric acid and urates, hence producing a cloud, and you might mistake for albumen, but boil, and urates disappear. Heat Test—Urine containing albumen—if boiled, latter is coagulated, gives white deposit, but heat produces phosphates; add nitric acid, and phosphates are at once dissolved, hence these two tests act as checks on one another. Brine Test—Mix 1 oz. H. C. L. in 1 pint Sat. Sol. of Na cl., on adding to urine an excess of this solution it gives a pp. of albumen. Put the brine solution in tube and add a few drops of urine, and so avoid mistake. But the brine solution always throws down the peptones and albumen, also pps. globulin, hence this test pps. all the albumen, and same test tube can be used to test for sugar. The brine test does not throw down urates. Johnson's Test—Picric Acid is a delicate test for albumen, it also pps. albumen, alkali, albumen, etc., also urates, oleo resins, alkaloids, peptones, but on boiling the latter four disappear.

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EYE COMPLICATIONS.—A special disease diagnostic of Bright's Disease. 1. Inflammation of retina, at first nearly cloudy and slightly swollen, but soon white spots appear grouped around the yellow spot. Sometimes the fundus of eye is splashed over with great white patches, probably fatty degeneration, consequent on inflammation, is called albuminuric retinitis. In addition, optic neuritis may be seen, swollen, blurred, vessels become buried in the disc. This eye affection is most common in the chronic form (cirrhotic). In addition, hemorrhages are discoverable often, so red spots and white patches are seen.

CEREBRAL DISTURBANCES.—Every function of nervous centres seem to be affected by Bright's Disease, blindness, neuralgia, epilepsy, etc., for toxic substances are everywhere in the blood. Cerebral uræmia may be acute or chronic, mild or severe. The chronic (mild form) is often present in cirrhotic kidney, slowness of speech or movement, passing into torpor, there may or may not be fever. Other uræmic symptoms may or may not be present. Severe but gradual coma may ensue from above. The acute invasion of uræmia may set in with epileptiform convulsions, or with sudden coma, usually both, and alternating. When attack is well marked, effects of intoxication are seen. He lies comatose, eyes shut, pupils contracted or dilated, he can be roused by punching or loud calling, but at once relapses; breathing is hissing, high pitched, stridulous. There are degrees of loss of consciousness. If aroused gives answers in monosyllables. Delirium sometimes is present, low or maniacal, chronic or passive. General sensibility may be more or less lost. State of muscles, twitching or convulsive, or paralysed, or rigid, or relaxed—may be paralysed on one side or both—may be more marked one day than next, etc. Temperature is generally low, normal or subnormal, but sometimes is 104 even. Uræmic vomiting or purging is common. In this state (comatose) urine will be scanty, or rather coma is caused by scanty urine. If there be convulsions they rapidly recur, may be intermittent and coma constant. Local apoplexy, one side or one limb may be noted paralysed without a hemorrhage into brain, is due to sudden œdema into area of brain supplying this portion of body, so a local dropsy may cause those symptoms of paralysis. Its pressure acts on arterioles, shutting off the blood supply of a part. These attacks of uræmic paralysis, the uræmic symptoms may all be absent, only the paralysis, no coma, vomiting, headache, etc., or dropsy, or fall of temperature. But generally with this paralysis there is increase of temperature. This paralysis is generally attached with contraction of pupil. Old writers called this "serous apoplexy."

THEORY OF URÆMIA.—1. Urea retained. 2. Carb. of ammonia from decomposed urea and many other causes. Truth, is uræmia is due to impaired functions of kidneys, they not throwing off the urinary excreta they should do, then all these retained cause the uræmic symptoms.

TREATMENT.—If a person's tissues are filled with uræmia products, if he gets cold, skin excretions checked, then he will at once develop uræmic symptoms.

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ACUTE PARENCHYMATOUS NEPHRITIS.—Milder forms, cox kidneys to action, kidneys are blocked up, give abundance of a mild diuretic, Digitalis Tr. or Inf. are good, as it does not act directly on kidney cells. As soon as under digitalis the kidneys act, give plenty of water; Citrate of Potash is often added to Digitalis or Cream of Tartar, or give an ounce of Cream of Tartar in Lemonade.

DIET.—Stop nitrogenous food, broths, meats, etc., even milk in severe cases. Rest in bed is essential. A purge may be required if bowels need it, as Pulv. Jalap Co. gr. 30 to 40, for children Castor Oil or Magnes. Sulph. dr. 1.

COMMON TREATMENT.—Eliminate poisonous matters by skin, not by kidney, by using diaphoretics, also by bowels by active cathartics given every other day as Pulv. Jalap Co. The favorite diaphoretic Liq. Amm. Acet. ss. oz. every four hours, adding a little antimony to each dose. Pilocarpine gr. $\frac{1}{2}$ to $\frac{3}{4}$ per mouth, or gr. $\frac{1}{4}$ hypodermically. This drug is not given in active stage but in sub-acute stage, as it is irritating to kidney. Baths are also good, hot water or hot air bath, or vapor bath. Hot water or air are preferred, do not over-heat surface or increase arterial tension too rapidly. Have bath at 98, leave in for $\frac{1}{2}$ an hour, put in blankets for 2 hours, then rub dry and put to bed. Hot air bath: put patient on high stool and two spirit lamps beneath, and make a tent with blankets. Or if too weak, hoop bed, etc. This method secures active perspiration. If temperature of skin is very high and urine almost arrested pack patient in sheets wrung out of hot water, and cover with blankets. Purgation may be necessary from time to time. If above methods fail, use diuretics, as Digitalis, it acts through heart, increasing blood pressure; usually dropsy subsides under this treatment, and albumen subsides. Of course all this time the diet has been regulated. Cupping or leeching of loins is also practiced, followed by hot poulticing. Blood letting (venous) is little practiced, may on some occasions aid. As acute stage passes off commence use of iron. Begin with mild preparations as Am. Fer. Cit. m. 5 to 10, increasing, giving with small dose of Amm. Citrate. Even after dropsy has disappeared test for albumen, and till it disappears keep patient on non-albuminous diet. If the milk produces heartburn or headache it may be skimmed, but the cream acts as a laxative. Tea, coffee and alcohol are to be discontinued. It is extremely important that the diet be strictly controlled till albumen is absent from urine, hence keep on milk and farinaceous diet; an occasional hot bath will also do good for some time.

NEPHROLITHIASIS—STONE IN KIDNEY—several varieties of concretions. 1. Uric acid usually smooth and small, may be in large numbers or but one; urate of soda may be found in crystals in kidney substance. These calculi are generally met with past middle life in gouty, drinkers, etc. 2. Oxalate of lime calculus comes next in frequency. The mulberry calculus, generally single, brown or black, and hard. Crystals of oxalate of lime may be found in kidney substance. 3. Phosphatic calculi are rare in kidney. The triple phosphate rarely composes much if any renal calculus. Much rarer forms are of xanthine, cystine, oxalates, etc. Effects: if numerous and large, calculi disorganize

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kidney substance, set up a pyelitis and suppuration of kidney, hence pyonephrosie, pus discharged by urethra, colon, duodenum, loin, groin, etc., a large calculus in pelvis or ureter may obstruct outflow of urine, hence pyelitis, etc., expansion and absorption of parenchyma and conversion of kidney into a cyst containing urine and serum or pus. The divisions of original lobes of kidney cause it to be sacculated; tumor may be very large, in other cases organ is not dilated but atrophied, hence small cyst enclosing calculus is all that remains of kidney; any permanent obstruction will act similarly, as from ureters, etc. In all cases first effect is distention of pelvis and calices of kidney, then tubules, and, lastly, capsules. At this time kidney is large, smooth, pale, and substance infiltrated by pure urine. Epithelium of tubes atrophies, hence a state of uræmia may ensue. In some cases a decided chronic interstitial nephritis is set up, causing atrophy of organ. Distending fluid at first is urine, but as pressure increases secretion of urine diminishes, finally ceases. The pelvis of kidney secretes pelvic cancer, tumors, renal calculi produce these effects. In this form of disease hypertrophy of heart may occur, stagnant decomposing urine from obstruction from meatus to kidney are sufficient to cause.

SYMPTOMS OF RENAL CALCULUS.—There may be no symptoms, usually it has well marked symptoms. First initiative stage,—pain in region of kidney, of variable intensity, often intermittent, induced often by jumping, etc. Pressure may be persistent and severe with sense of heat in part. Pain is deep in renal region. It is often felt in sacrum. If in right kidney, pain is usually referred to right hypochondriac running to umbilicus and not found over kidney. Is attended with constipation, may be confounded with biliary or intestinal colic. Pain often extends along ureter to testicle, which may be retracted and swollen (rarer at this stage). Pain may be felt along course of ext. cutaneous nerve. Blood in urine is frequent symptom, just enough to be noticed by patient, such blood occurs after riding, running, etc. Most frequent with rough oxalate of lime calculus. Hæmaturia may be absent all through a case. First indication may be pus in urine. Frequent micturition is a common symptom. The urine in this early stage is turbid; when passed, a sediment forms in upper layers, may contain a few blood cells, lower amorphous lithates, perhaps crystals, etc. If calculi do not escape now they grow rapidly, for deposits occur on nucleus. When, pyelitis ensues pain is increased; signs—increased micturition and irritation in urinary organs, pain in perineum, micturition more frequent at night, urine cloudy, pus in it, etc. If calculus does not escape it enlarges; but as long as pus escapes from kidney, patient does not suffer more than usually, but when occlusion occurs a renal abscess exists. Urine then becomes clear, for it is from sound organ. Stone may dislodge, hence turbid urine again, with less painful symptoms. Future progress of suppurating kidney varies. Commonly kidney becomes sacculated, parenchyma destroyed. At this stage a tumor can be easily made out in renal region, or abscess may enlarge slowly, causing constitutional symptoms. Signs— hectic and inflammation extends to

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surrounding tissues, hence perinephritic abscess which may communicate with kidney, may point in lumbar region, colon, along psoas, etc. Or hepatic abscess may occur, diaphragm may be perforated, hence empyema, etc. In other cases renal calculus may escape into bladder, the commonest course. If of small size may cause no symptoms. If large enough to distend ureter you get violent symptoms,—calculus, nephralgia or renal colic, sudden access of pain in renal region shooting down ureter to groin to testicle with retraction, with symptoms of collapse or syncope, frequent calls to micturition, blood in urine, etc. All symptoms cease suddenly when stone slips into bladder which may be in a few minutes to a few days. If it be uric acid stone, there will be more to follow; if oxalate of lime, no more to follow. But a renal calculus may become encysted in kidney and cease to be irritating hence recovery. Treatment renal calculi. Try and determine its nature by repeated examinations of urine, and so try and prevent increase in deposit. If of uric acid, promote cutaneous functions and correct digestive functions, regulate diet, lessen nitrogenous food and excessive eating, avoid food causing acidity, as much liquors, etc., much same as gout treatment. Give alkalies as K. Cit., etc., and especially Lithia water to promote solution. If you have oxaluria, treatment will vary with course, hence disuse of hard lime water if due to that. If due to insufficient oxidation of starches, sugars and fats, regulate diet and promote oxidation by exercise, etc. In the oxaluria (true form) from gastro-intestinal catarrh, direct treatment to cure that, have diet of plainly cooked animal foods, small quantity of vegetables only, and avoid completely saccharine and starchy foods, alcohol, etc. To remove catarrh give 1 dr. of Carlsbad salt in a. m. before breakfast, or Bisul. Carb. 15 grs. B.I.D. ante cibum, or Nit. Mur. Ac. Dil. m. 10 Post cibum. Phosphates in urine are associated with nervous symptoms, hence treat these by Codeia. Also use warm baths for pain. When nervous symptoms are cured, stop Codeia and give tonics, Mineral acids, Nux, etc. Diet to be light and nutritious, avoid alcohol. When calculus is in transit, hence in renal colic, relieve pain and spasm, hence Opium in hypodermic. If this fails give Chloroform or Ether by inhalation. Hot bath is also good, relieves spasm; some cup the loins, fomentations there, etc. Mild diuretics may also be given, especially digitalis and weak sol. of K salts or Couch Grass infu. Let patient drink diluents freely, as barley water or linseed tea and lemon juice, or even cold water, or with cream tartar. Stone in kidney—if you are sure of diagnosis and it has lasted some time, and symptoms continue operate. Acute nephritis from calculus—rest in bed, slow diet, leeches over groins, active purgatives Ol. Ricini, not irritating to kidneys, hot fomentations to loins, diluents, avoid diuretics, for pain use Opium, Camphor, etc. If it ends in pyelitis, renal abscess treatment must be supporting, nutritious diet and wine and iron, Ol. Morrh, Quinine, also Buclu, Cubebs or Copaiba, small doses for local action, change of air, etc. These cases should be turned over to surgeon. (For surgical kidney, see page 65.)

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TREATMENT OF CHRONIC INTERSTITIAL NEPHRITIS.—If from symptoms you suspect this disease from albumen in urine, defective vision, frequent micturition, etc., what will you do? It cannot be cured, but you can arrest its quick progress, and thus prolong life. First try and find out cause, as gout, exposure, business worry, etc. But constantly no cause can be found, or you may only suspect the disease. Certain indications are correct disturbed digestion, improve condition of skin, attend to renal secretion, improve impoverished blood and general nutrition, watch tendency to uremia and prevent its actions. The skin is an auxiliary organ to the kidney, so maintain and promote its functions. One man says impairment of function of skin is the prime cause of Bright's Disease, also by diverting blood to the skin you relieve the kidney congestion. Free secretion from skin relieves arterial tension, so here is use of baths. Daily baths are good. Hot vapor bath is stimulating, increases arterial tension, hence is dangerous. Hot salt water bath or tepid douches or packs of salt water. Dry friction, massage of muscles or skin all aid functions of skin. Such persons should wear flannel, should live in dry and warm climates (Florida, Egypt, Algiers, etc.), and where variations of temperature are not common. Not necessary to confine to bed unless urgent.

Medicinal diaphoretics, either Amm. Acet. or Pilocarpine, gr. $\frac{1}{4}$ to $\frac{1}{2}$ every three nights. The last is very useful for kidney, is not irritable, give 2 to 3 times per week. Promote healthy quality of blood. It is uremic, and albumen is wanting. Anemia is present, so give Iron, as Bisham's mixtures, Tr. Fe.-Chl. m. 5 to 10, Ac. Acet. Dil. m. 20 to 30, Liq. Am. Acet. dr. 2, this is but one dose, but give it T. I. D. in water. Add Syr. Limonis if needed, or give Tr. Acetate Iron in above instead of strong chloride. If urine becomes bloody, or albumen increases, or headache, then stop iron for a while. Other tonics, as Nux Vom., Strych., Quinine, Hypophosphates, etc. If there is failing heart power give Tr. Dig. m. 5 to 10 T. I. D. along with iron. Inhalation of oxygen oxidize effete matters, is very powerful, inhale about 30 litres per day, two at a time. No agent will stop proliferating of tissue, but try Pot. Iodid. grs. 20 to 30 in a. m. before breakfast one hour, so that it at once reaches kidneys. The Bi. Chl. Merc. gr. $\frac{1}{16}$ th T. I. D. is also highly recommended, especially if syphilis be suspected as a cause. Chloride of Gold gr. $\frac{1}{16}$ th to $\frac{1}{8}$ th T. I. D. is also recommended, so is Liq. Arsenicalis m. 5 T. I. D. But evidence of this good effect is not much.

DIET.—In large white kidney following acute form best diet is exclusively of milk, carrying it out for 1 to 2 years if possible; but if not tolerated give diet with a little animal food, milk in its place. This rule must not be pushed too far in advanced stage of cirrhotic kidney, this low diet has to give place to a nourishing diet. Stimulants as a rule must be avoided, but if weak heart calls for it you must give it.

TREATMENT OF AMYLOID DEGENERATION.—Remove cause, remove suppuration by whatever treatment is needed, amputation, drainage, etc. Always treat syphilis with great care, give anti-syphilitic treatment thoroughly. When

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cause cannot be made out, then Pot. Iodid., Iodid. of Iron, Am. Mur., Nitric Acid and Pot. Iodid. have been found useful. Iron is called for. Uremic symptoms are not often present, diarrhoea, small doses of Opium, Lead Acet., etc.

TREATMENT OF SPECIAL SYMPTOMS UREMIC CONVULSIONS.—Common method is to eliminate poison by all the emunctories, or by blood letting. This last lets out a lot of effete matter and relieves arterial tension. Cupping of loins in children is useful. Baths are to be employed. Inject Pilocarpin gr. $\frac{1}{2}$, it will cause sweating, but is dangerous if patient is comatose, as saliva may choke. A drastic is always given, elaterium gr. $\frac{1}{4}$ every 2 to 3 hours till you have profuse discharge. The convulsions call for sedatives, some use Chloroform. If convulsions are not violent give Chloral, give gr. 10 to begin, then gr. 5 every 2 hours or less, even every $\frac{1}{2}$ hour if symptoms need it. Bromide of Potass. may also be given, gr. 20 to 30 every 2 hours or oftener, even with Chloral. Ice cap may also be used. 2nd method, American, is Opium under skin to allay irritation, Morphia gr. $\frac{1}{4}$ every 2 hours, even double the dose if necessary if convulsions continue, it relaxes arterioles and sustains heart. Chloroform not needed. It is often noticed that under this treatment the bowels will act, ditto kidneys. Combined treatment is bleed, give purgative, and inject Opium, useful in acute attacks.

CHRONIC CEREBRAL SYMPTOMS.—Convulsions will yield to Chloral, combining with purges, diaphoretics, etc.

UREMIC COMA.—Chloral or Opium of course are not indicated. Remove poisonous principle by diaphoresis, avoiding Pilocarpin (saliva may choke), use Antipyrine, etc., purgatives also, inhalation of Oxygen, injection of dr. ss. Ether to stimulate heart, keeping in life while drugs are acting.

ARTERIAL TENSION.—1, 2 to 3 gtt. of 1 per cent. solution of Nitro Glyc. is used T. I. D., to relax arterial tension, relieves headache, noises in ears, asthenia, etc., give for months together to keep tension down. Uremic asthma sometimes is relieved by hypodermic injection of Morphia gr. $\frac{1}{8}$ th to $\frac{1}{4}$ th. Often an acute purge will do same. Hyoscine gr. $\frac{1}{100}$ th is also good for insomnia, give hypodermically, sleep in 20 minutes, no ill effects. There is a variety of kidney resembling a Bright's kidney, the "cyanotic indurated kidney" or the cardiac kidney, due to chronic venous congestion, which leads to hypertrophy of the connective tissue of the organ. Causes are central which obstruct circulation, as valvular disease, chronic interstitial pneumonia, emphysema. Local causes: abdominal tumors compressing renal veins, thrombosis of these veins, or of vena cava above, pregnant uterus, etc. This kidney is a large red smooth kidney, firmer than natural and redder than normal, due to congestion. Capsule easily removed. On incision no change in relation of parts is seen, blood vessels are thickened and dilated, the epithelium for a long time is round, but finally becomes fatty, and then albumen appears in urine. In this stage urine is scanty, high colored (urea), and urinary pigment S. G., high, 1025 to 1030. It contains only a small quantity of albumen, 1 per cent. Sometimes a few red cells are found. Casts

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often absent, if present are hyaline. There is always general dropsy in these cases. There is always absence of uræmic phenomena, and you will always find a cause for obstruction of venous blood. Treatment of "cyanotic indurated" kidney is that of valvular disease.

ALBUMINURIA other than from disease. In 150 patients 36 had albuminuria and only 13 of these had Bright's Disease. Of 50 cases, children, 7 had albumen in urine and only 1 had Bright's Disease. In 40 cases of alcoholism 19 cases had albuminuria. Albuminuria is either organic or functional. Conditions are due to disorders of digestion "Peptic Albuminuria," met with chiefly after eating largely of diffusible albuminous food,—eggs, cheese, etc., or from non-assimilation of proteids. 2. Disorders of liver give rise to albuminuria. In this case you are apt to have subicteroid line of skin, elimination of excess of urea, nausea, in some cases peptones. 3. Due to disordered enervation "Neurotic Albuminuria" puncture of 4th ventricle above diabetic centre leads to albuminuria, ditto section of renal nerves, also irritation of cervical or abdominal sympathetic nerves. Shocks, loud noises, detonations, sudden exposure to intense light, also give rise to albuminuria, ditto cold baths due to shock, also mental shocks, blows on head, epilepsy and ophthalmic goitre. 4. Hæmic Albuminuria due to alterations in the blood, perhaps the same as appear in pregnant women, or those near menses, also as met with in scurvy, purpura, malaria. In following cases, as lead, phosphorus, mercury poisoning, absorbing pus, or urine charged with urates, then we can suppose a slight inflammation of tubules resulted. This is rather organic than functional. Ditto in jaundice. 5. In old and very corpulent people albuminuria is often found, due to them being large eaters, having no capacity to use up all they take in, hence kidney is overworked and allows albumen to escape. 6. It is also thought there is a physiological albuminuria, unsettled. Differences of opinion are probably due to no distinction being made between different forms of albumen, peptones, etc. Again leucorrhœa often furnishes albumen, or gonorrhœa in male, or semen or pus from urinary tract.

DIAGNOSIS OF FUNCTIONAL ALBUMINURIA.—1. These are usually temporary, and many samples of urine may be found free from albumen. 2. There will be an absence of Bright's symptoms, as hypertrophy of heart, increased arterial tension, or uræmic symptoms. 3. As a rule casts will be absent, epithelial at any rate; occasionally you may find hyaline casts but only a few. If they were present constantly and in numbers you would fear organic trouble. Be sure and make sure in testing you have albumen.

TREATMENT.—As a general rule, rest of body, change of air and a course of tonics will remove. In peptic albuminuria pay attention to diet. In most of these cases the liver will be found at fault, skin sallow, urates heavy in urine. Probably constipation, rich animal diet, etc., aggravate. Place on a milk diet. If liver is involved give a course of Mercury. After correcting liver follow by a course of Mur. Ac. and bitters, as Gentian, Quassia, etc. Acting on skin, baths, exercise will help liver.

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CHRONIC INTERMITTENT ALBUMINURIA.—Cyclic, adolescent, occurs from 15 to 25, almost exclusively in boys, but has been met with in girls, also by others. Albumen is found not to be constant. Is to be looked for after a full meal, after exercise, etc. Urine itself has an average density, acid, amount of albumen is small, oxalate of lime deposits, mucous threads and sometimes a few hyaline casts. Such urine is always rich in urea and pigment. Health of patients—always say they are well, but friends say they are pale, morbid, listless, headache, examination of urine alone makes one anxious. Duration varies 1, 2 to 3 months to 2 to 3 years. It is quite curable, but some cases go on into actual Bright's Disease. Cure—as a rule rest in bed, abstaining from violent exercise, careful diet, little animal food and tonics, cure. Dr. Howard thinks more than one disease is included in albuminuria of adolescence. Some cases are mild, organic cases, others slight catarrh of tubules.

HEMOGLOBINURIA.—Functional albuminuria as before discussed is consequent on some constitutional trouble, as gout, syphilis, etc., or else that some disorder of vasomotor nerves exists, but it is said that these functional disorders are minor stages of hæmoglobinuria. This last Hæmo resembles former in that it is a disease of young adults. Also it is almost always associated with a constitutional taint, also that patients may look well, but are anæmic, marked by paleness and deficiency of red cells. Hæmoglobinuria is also accompanied by marked jaundice and dyspepsia, also is liable to bilious attacks, also although in interval albumen disappears from urine it will persist after disappearance of excess of blood pigment in urine. Also urea is in excess, also after blood pigment has disappeared the urine pigment will still be in excess. The distinguishing point of hæmoglobinuria is that the coloring matter of the blood is present, but not the cells. Functional albuminuria has been seen to pass into hæmoglobinuria. Lastly, treatment is same for functional albuminuria and hæmoglobinuria. Restricted diet and tonics.

CAUSES OF HEMOGLOBINURIA.—Whatever dissolved blood globules will produce it, as toxic agents, Pot Chlor., Pyrogallie Acid, Oil of Naphtha, Nitrate of Amyl, Phosphorus, Mercury, Lead, Chlorine, Iodine, Mushrooms, snake poisons, also poisons of infective diseases, malaria, also extensive burns, severe exposure to cold. Also transfusion of blood of one animal into another leads to destruction of red cells, hence use human blood. Lastly, in unexplainable cases.

TUBERCULOUS DISEASE OF KIDNEY.—Two forms: 1. Miliary tubercle in which miliary nodules are scattered over and in kidney. It is pathological, a part of a general tuberculosis, is not diagnosable. 2. Tuberculous kidney, serofulous, renal phthisis. In this tubercles form in organ, leads to inflammation and infiltration, caseation of tubercle and breaking down. This form may begin in kidney itself, usually in pelvis, and extends in, but usually it begins in bladder. Also will be found in vas deferens, testicle, ovary, uterus. The softening of caseous tubercle leads to formation of cavities.

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to tuberculous family. 2. He may have or does suffer from pyelitis. Its symptoms are: 1. Pain in loins (one or both) intermittent or constant, extending down under, sometimes felt in testicle, sometimes along ext. cut nerve. 2. Frequent micturition, urine often contains blood, early in small quantity, and constant. After blood pus will follow soon, at first small—urine turbid. Fragments of calculi are not found. 3. There will be steady progressive loss of health, strength may become worn out and die of asthenia. Uremia is sometimes cause of death. Time of course of disease is 1½ months to 2 to 3 years. Sometimes slight enlargement of kidney can be made out. Occasionally peri nephritis is set up, hence tumor in loins, hectic symptoms, rigors, fever, sweating (night). In examination sometimes a nodule can be detected in testes, or per rectum in prostate, or it may be enlarged, ditto vesiculae seminales. Finally, some diagnosis is complete! by finding tubercle bacilli in urine. More males suffer than females.

PROGNOSIS is unfavorable.

TREATMENT.—Palliative, keep up nutrition. For pain give Opium, Camphor or Paregoric. A favorite prescription is Paregoric ½ dr., Ac. Benz. gr. 10 T. I. D. Large doses grs. 5 Quinine are good. Excision of kidney is no good, for both are usually affected. Suppose pus disappears from urine for a few days, and pain was manifested in one side, then that kidney alone is affected, and excision might be practised.

CARCINOMA OF KIDNEY may be primary, but generally is secondary to cancer of a neighbor. While cancer in children is rare, cancer of kidney in children is comparatively common. Frequently met with in children under 4. Secondary form occurs in middle life. Primary form occurs at any age. Kind of cancer is the soft, medullary variety.

CLINICAL FEATURES.—1. Hæmaturia, if early and abundant, frequently indicates cancer, no clots. This will not have been preceded by 2. Symptoms of renal disorder, as frequent micturition or uric acid, or lithates in urine, or pains, nor will gout have preceded it. During hæmaturia there is frequent micturition, but when it ceases so does frequent desire to make water. Urine contains no pus till advanced stage. At close hæmaturia is constant. Cancerous cachexia shows itself, and now a tumor can be made out, even may fill the belly. End is then not far off.

DIFFERENTIAL DIAGNOSIS.—A large renal tumor in a child if not congenital is either a cancer or sarcoma. If tumor be congenital it may be cystic disease or hydronephrosis or malignant disease. Cancer of bladder by its hæmaturia may cause difficulty, but the blood gathers in body, coagulates, may plug up passage, etc., hence differing from cancer of kidney. Urine will be offensive, ammoniacal. A tumor of bladder may be felt per rectum, vagina or sometimes at epigastrium. If size thus appears large, a catheter will find it small inside, cancer is indicated. If you can get particles of tissue, then microscope will help diagnosis, but seldom can you get them.

TREATMENT.—Palliative, opiates for pain. Astringents for hemorrhage.

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Sarcomatous tumors are also met with in kidney, hard to distinguish from cancer, but not so liable to hemorrhage. Both kinds of sarcoma, round and spindle celled, and sometimes myo sarcoma.

CYSTIC DISEASE OF KIDNEY may be congenital when it may be large enough to prevent delivery, but it also occurs in adult life. Kidneys may be as large as small water melons. There may be enough healthy sound tissue between cysts to preserve life. Cysts due to distention of Malpighian capsule. This is a distinct disease from cysts formed by Bright's.

PARASITES OF KIDNEY.—Hydatids of kidney often form large tumors, sometimes tumor opens into pelvis of kidney and discharges daughter cysts into urine. Hydatids of kidney are usually an accompaniment of hydatids of liver. Strongylus, a worm is found in kidney. Filarius hominis is found in blood, in chyluria it infests kidney. Movable kidney or floating kidney is common, 1 to 139. Met with especially in females 32 to 14, especially in adults and in child-bearing periods, but is met with in children. Is 4 to 5 times more often right kidney, but sometimes both. May be congenital, but may be acquired.

CAUSES.—Absorption of pad of fat holding it (?) Chief cause is relaxation of abdominal walls, as after delivery, so kidney lacks support. Some think anything which drags down the peritoneum may cause it, as severe hernia, or prolapsus uteri. Tight lacing is also given as a cause, interferes with action of diaphragm, causes up and down movement, not expansive breathing, hence pushes down kidney, or pressing of liver may push kidney down. Great muscular feats, straining at stools, may not act, but sudden shocks, as frequent coughing—blows may produce it. Some think there may be congenital looseness of tissues which hold kidney.

DIAGNOSTIC SYMPTOMS.—The disease may be latent, no inconvenience. But in others a sense of uneasiness and weight are felt. Colic, nausea and vomiting may occur. Pains may radiate up to shoulder, as in kidney disease, down ureters as in kidney disease, or in testicle due to stretching and twanging of ureter. Frequent desire to make water is noticed. In some of these attacks collapse may threaten, you suspect peritonitis. Urine high colored, perhaps a little blood. Sometimes disturbed circulation will cause oedema of feet. Examination,—patient in dorsal position, knees drawn up will frequently lead to recognition of a movable tumor. In thin persons you will see a little hollow close to ribs filling up if you push back tumor.

TREATMENT.—Easy to replace, hard to retain, stitching into place is not advisable. Modern stays from pubes to crest of ilium sustaining abdominal walls will keep it in place. Special pads may be made, but are not satisfactory. Avoid constipation.

XVI. DISEASES OF LUNGS.

Consumption causes $\frac{1}{3}$ th of total mortality.

CLINICAL TOPOGRAPHY.—Front—draw two horizontal lines, one at 3rd, other at 6th rib, and one at each acromial angle down. Then clavicle and edges of

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sternum make other lines. Then divisions are : Supra clavicular, clavicular and infra clavicular, mammary and infra mammary regions. There are also supra sternal, superior and inferior sternal. The horizontal line at level of 3rd rib is prolonged to sides, dividing lateral region into superior and inferior axillary regions. On the back two horizontal lines, one at level of top of scapula, other at bottom, give a supra scapular, scapular and infra scapular regions. There is also inter scapular. In front the lungs extend from $1\frac{1}{2}$ to 2 in. above clavicle to 6th rib. In middle line lungs do not meet till at level of junction of 2nd costal cartilage. The right lung runs down to 6th rib, follows its cartilage, then to the 8th rib laterally and 10th posteriorly. The left lung keeps middle line to 4th cartilage, then leaves a notch. The "superficial cardiac region" then drops down to 6th rib, 8th laterally and 10th posteriorly. To count ribs in fat persons, find 2nd rib at ridge on sternum, and then count down. If a patient holds arm over head the upper digitation of serratus magnus will be level of 6th rib in axillary region. The nipple is found on 4th rib or 4th interspace. Draw tape around chest at level of nipple gives 6th interspace in axillary line.

LUNG ITSELF—FISSURES.—Both lungs are divided by a great fissure dividing into an upper and lower lobe. This fissure begins on level of 5th cartilage, passes up obliquely behind to upper part, at level behind of apex of spine of scapula. Right lung has another fissure, beginning at 4th cartilage, passes upwards and backwards, and intersects great fissure at middle of lung behind.

XVII. BRONCHITIS.

AFFECTIONS OF BRONCHI.—Bronchitis is divided into two,—catarrhal and membranous (plastic) bronchitis. Catarrh consists : 1. In hyperemia of blood vessels ; 2, in increase and alteration of secretion of membrane ; 3, swelling of membrane ; 4, in juiciness of tissue ; 5, in formation of young cells. By "membranous" we mean a formation of a fibrinous exudation in the other membrane. Catarrhal Bronchitis may be primary or secondary, may be acute or chronic. It is also divided according to the part of bronchial tree affected : 1. That involving larger tubes. 2. General bronchitis, involving smaller tubes.

FIRST FORM.—Larger bronchi involved, usually involves trachea. Common mode of attack is sense of chilliness, lassitude, slight febrile disturbance, aches in body. Sometimes there are symptoms of catarrh elsewhere, sneezing, sore throat, hoarseness, etc. Coughing denotes bronchi affected. General symptoms,—sensation of distress, tightness, oppression in front of chest. Cough early, paroxysmal, short and dry at first, no expectoration for 24 to 48 hours. Then at first is like white of raw egg, gradually becomes more free, changing, first yellow spots in sputa, then sputa becomes opaque—pus, no blood. There is as a rule but slight constitutional symptoms, a little thirst, slight fever, and pulse a little quicker. Symptoms gradually subside, lasting 4 to 7 days in a vigorous patient, 2 to 3 weeks in less vigorous. Primary bronchitis does not tend to invade capillary bronchi except in children. When it occurs in delicate persons or diseased attack is asthenic, may become chronic and may even end fatally in these.

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DIFFUSE GENERAL BRONCHITIS is severe, dangerous, involves whole of bronchial tree. Is also called capillary bronchitis. It is especially apt to occur in the extremes of life—*young and old*. In adult, primary bronchitis of larger tubes rarely extends down to capillary tubes, but secondary bronchitis from fevers, etc., does frequently extend to capillary bronchi. In children, inflammation of larger tubes constantly tends to spread down to capillaries, especially in weaklings.

INVASION frequently sets in with distinct rigors, headache, vomiting, especially when it begins in the capillary tubes; but if it extends from larger bronchi down, the attack of the capillary tubes is not so marked, but now and then the extension is marked with symptoms as above. The disease may attack both small and large tubes simultaneously. Symptoms then would be more severe, temperature 101 to 103, pulse more frequent, thirst, loss of appetite, urine high colored, etc., as in fever. In this case there is more constricted feeling in chest, a tearing sensation, dyspnoea, not noticed in ordinary bronchitis, but marked in this form, hard breathing. The relation between pulse and respiration is to be noted, normally 4 to 1, but ratio varies in diffuse bronchitis, perhaps changed 2 to 1.

CHARACTER OF COUGH, in diffuse form, is almost constant, is a short bark, dry at first, gradually expectoration appearing, clear, changing to opaque, etc. In severe cases oxygenation of blood is incomplete for capillaries are swollen and air cells lessened. Signs of want of oxygen, more or less lividity of ears, fingers, etc., drowsiness in children, and then do not like to be disturbed, constantly in children and adults the dyspnoea makes patient sit up to breathe. Gradually as *Co.* accumulates in blood patient becomes lethargic, cough diminishes, for respiratory centre is poisoned, heart fails, pulse rapid, shallow and feeble, extremities grow cold, cold clammy perspiration breaks out. Towards close perhaps convulsions and coma. When *cr.* is protracted, oedema of feet, face, etc., is marked. This diffuse form is particularly fatal in children in a week, in adults 10 to 14 days, but life has been destroyed in 48 hours. In cases of convalescence change for better shews itself in 10 to 20 days.

SUFFOCATIVE CATARRH—"Malignant Bronchitis"—sets in so violently patient falls into collapse. In old persons and children great vital prostration. When reaction sets in, symptoms of diffuse bronchitis are found, but fever is not marked. Symptoms of respiratory paralysis are seen on 2nd to 3rd day, due to filling up of fine bronchi by mucous and consequent *Co.* poisoning.

MORBID ANATOMY.—"Bronchitis." Steps in catarrh of bronchi. 1. Hyperæmia of inflamed tube down to 4th to 5th divisions, and at same time basement membrane begins to thicken. 2. Then is an oedematous state of basement membrane and submucosa, and so narrows tube. 3. The cylindrical epithelium loosens and desquamates at 30 hours. At same time the flat epithelium near basement membrane is proliferating. This is the stage when patient complains of rawness, for basement membrane is raw, uncovered. In severe cases the sub-

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jacent connective tissue proliferates, increasing the thickness of the wall. Looking at inflamed bronchi, the membrane is redder than usual, more turbid, swollen and juicy, is covered by exudation, covered by pus in later stage. If smaller tubes are affected in late stage some of them will be found dilated with secretion. At same time lungs will be found over-distended with air. But collapse of lung is brought about in capillary bronchitis thus: a plug of mucus in bronchiole during expiration allows a certain amount of air to escape from air vesicle, but air cannot get past plug of mucus, it acting as a ball and socket valve. Hence air is gradually exhausted from air vesicle, hence collapse. This is a very serious complication.

APPEARANCE OF COLLAPSE OF LUNG.—Here and there are seen lobules in a lower level than other lobules, are dark (venous), are non-crepitant or nearly so. You can inflate them by blowing into bronchi in early stage. On invasion you find affected lobule solid, frothy serosity. At a later stage in chronic case this portion becomes carnified. Besides patches of collapse you will find over-distended parts to compensate. Collapsed lobules undergo inflammation, are then elevated. There are also lobules, yellow specks, pus. Capillary bronchitis in children is often associated with lobular pneumonia. In an acute bronchitis the bronchial glands are enlarged.

PHYSICAL SIGNS.—Severe general bronchitis. Inspection. Upward movements of upper part of chest are increased—lower part of chest, expansion movement is not increased, for air does not rush in. Percussion gives a resonant note, no consolidation, yet sometimes there is a hyper resonant note due to over-distention with air. Extensive collapse would give dullness. Auscultation over bronchial tubes gives some variety of whistling note, low over large bronchi, high pitched over small bronchi, sibilant wheezing, whistling heard both in expiration and inspiration due to vibration of mucus. When secretion is abundant you get moist rales, mucous rales, large and small bubbling rales, air bubbling through, both at end of inspiration and at end or during expiration. Size of rale depends on size of tube. Further, these rales are symmetrical, whole of bronchial tube affected. Whistling will be uniformly distributed, mucous rales in lower part. Palpation gives vibration of these rales.

ETIOLOGY.—Age—the very young and very old have attacks oftenest and most severely. Nutrition—weakly and ill-nourished persons are most apt to get it. Those who do not get out enough are liable, as children kept in too much. Previous attacks predispose. Also certain diseases. A new-born child will often die of bronchitis without doctor knowing of it. They have little cough, are livid, breathing shallow, temperature is sub-normal, they are limp. Perhaps only evidence of bronchitis is sneezing and sniffling, but listen to chest and you will detect it.

EXCITING CAUSES.—The greatest one is exposure to cold, affecting any part. Cold when body is overheated, drafts, overheated air, aerial gases, such as chlorine, ammonia, etc. Wet feet, mechanical irritants, dust, especially of veget-

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able origin and cotton grain, then metallic dust, animal dust, mineral dust, millers' asthma. The charcoal from unburnt oil from a smoking lamp causes an asthma. This sets up a bronchitis followed by fibroid phthisis. Epidemic influences not well known, as influenza, which is always complicated. Also diseases due to morbid poisons, as measles, whooping cough. Local diseases in chest, as tubercle, pulmonary cancer, heart disease, valvular disease, leading to retardation, or blood flow through lungs, leads to bronchial catarrh, aneurism. Blood diseases, as Bright's Disease, acute and chronic parenchymatous nephritis, gout due to poison in blood, acting as local poison.

DIAGNOSIS.—It may be readily confounded with acute pulmonary phthisis, bronchial pneumonia, acute tuberculosis.

TREATMENT.—Can it be cut short? Try. If in first stage try and avoid it by a diaphoretic (not lemonade) and a purge. Better give Dover's powder gr. 10, or Antifebrine gr. 7 at night, and a saline purge in a.m. If disease resists this and develops, you have to treat bronchial catarrh. In the dry stage give tartar emetic, gr. $\frac{1}{4}$ th to $\frac{1}{2}$ th, nothing surpasses it. Give it even every 2 hours if constriction is great, or put a grain in a cup of sweetened water, and give a teaspoonful every 10 minutes. Vin Ipecac m. 15 is a full dose, it is usual to add some salt, Pot. Cit., Pot. Nit., Pot. Bicarb., gr. 5 to either, each dose to either Ipecac or Ant. Tart. promotes action. A sedative is generally required. Tinct. Camp. Co. m. 10 to 15 is good. Small doses if you are trying to promote secretion, Chloral 1 to $1\frac{1}{4}$ per dose is good. Tinct. Hyos. and Hemp is also good at same time to allay irritation of throat. Air of room must be kept moist by a kettle boiling in the room, or let patient inhale steam. If distress of chest is great, cover it with hot poultices and hot stupes. They may be allowed to drink freely any of the mild alkaline waters. Once secretion is established reduce doses of Tart. Ant. to $\frac{1}{12}$ th gr., or Vin Ipecac to 10m. or Ipecac $1\frac{1}{4}$ gr., still give the alkaline salts. The Liq. Am. Acet. is a good addition to any cough mixture. Pot. Iodid. is a good liquifier of bronchial mucus, and if there be spasmodic action of bronchial muscles it allays spasm. Bellad. in a moist stage would be useful to allay spasms. Tr. Squills in 10 to 15 m. in moist stage is also good, also Am. Carb. gr. 3 to 4 is a good expectorant. Sedatives—in bronchitis of adults the fear of sedatives is not as necessary as in children. So long as there is no lividity or dyspnea and expectoration is free, you can continue the Tr. Camp. Co., but otherwise withhold it, for he must cough, pain or no pain.

CAPILLARY BRONCHITIS (dangerous) at beginning needs promptest treatment. Aconite 1 to 2 gtt. of Tr. every two hours, or $\frac{1}{4}$ gtt. every $\frac{1}{2}$ hour for 4 to 5 hours, to reduce frequency of heart's action. If pulse grows weak give Alcohol and reduce dose of Aconite. The same remedies can be employed as in treatment of ordinary bronchitis. Spasms are apt to recur, so as soon as the moist stage is reached add Bellad. In this form Am. Carb. gr. 5 is given early, especially in children and old people. In this form watch closely for accumulation of mucus, lividity, bubbling over back of lungs, then give an emetic. Dur-

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ing vomiting compression of base of lung forces mucus higher up, also expiratory effort will be greater, so a great deal of mucus will also be raised. This emetic may be needed once or twice per day. At same time stimulants may be needed, brandy every hour. The emetic must not be depressing. Alum 1 to 3 teaspoonfuls, Zinc Sulph. 5 to 30 gr., Apinor. $\frac{1}{4}$ th hypodermically.

EXTERNAL STIMULANTS are needed in all severe cases of bronchitis. Poultices are no use unless kept hot—care must be taken not to expose chest while changing—a cotton wool jacket covered with silk is good. Mustard plasters to reddened skin, or muslin wrung out of capsicum inf., or a mustard inf., 3 to 4 per day, between poultices. Supply patient liberally with hot drinks to favor expectoration and raise blood pressure. In desperate cases oxygen is inhaled with advantage. Bronchitis in rickets needs stimulation from beginning—Am. Carb., brandy, etc., for the chest wall is weak.

DIET.—In first stage weak, as milk, etc.; in later stage broths, etc. Fresh air—air of room needs to be good, introduced from the window of adjoining room, no drafts, temperature 66 to 70; if disease tends to become chronic give a stimulating Balsam or turp. 5 to 10 m., Bals. Canad. or Copaiba, also give Quinine and Iron, mineral acids as tonics. If still persistent, order change of climate, milder and dryer, feed well, active counter-irritation on chest. Iodine, Croton Oil, etc., A stimulating liniment, as Lin. Tereb. Acet., apply on flannel.

CHRONIC BRONCHITIS.—*Ætiology.* It is a rare sequel of acute form, but is far more apt to follow repeated attacks, especially in scrofulous, gouty or rickety people. Some persons have from birth a catarrhal diathesis, especially involving tract to mucous membrane, in contact with the air that is bronchi. It also attends chronic valvular disease, Bright's Disease, alcoholism, tubercle in lung—it is not an uncommon sequel of measles and whooping cough—dust also produces a common variety.

SYMPTOMS are essentially those of acute form, only febrile symptoms are not so manifest. The presence or absence of expectoration gives names to it, such as dry catarrh, bronchorrhoea, bronchoblennorrhoea. There is recurring cough and more or less expectoration, whistling in bronchial valves, no dullness, resonance may be excessive. Emphysema may exist. If dilated bronchi are present, of course you will note tympanic resonance.

MORBID ANATOMY.—Bronchial membrane congested, dull red; membrane is thrown into folds and thickened; under the microscope most of the cylindrical cells are gone, but an intermediate transitional cell replaces it. The thickening is confined to mucosa, which is infiltrated by cells; both muscular and cartilage layers are atrophied, but fibrous layer is thickened, for peri-bronchitis is set up by bronchitis. In long standing cases certain effects are noted; 1, Emphysema; 2, dilatation of bronch.; 3, occasionally fibroid degeneration of lung tissue. Cirrhosis begins around bronchi and extends into lung tissue; 4, on heart obstruction to circulation produces dilatation of right side of heart, and with it tricuspid regurgitation, and finally cardiac dropsy.

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TREATMENT.—First find out the cause of trouble, and treat it as if from gout, alcohol, Bright's Disease, valvular disease, etc. These need first treatment. Direct treatment of chronic bronchitis. Great benefit is derived from active counter-irritation, repeated small blisters every 8 to 10 days. In mild cases frequent rubbing with Lin. of Iron, Tereb. Acet. or painting with Iodine St. George paint. Use 2 to 3 times per week. The use of these counter-irritants needs keeping up, for disease is chronic.

INTERNAL REMEDIES.—1, Think of condition of mucous membrane; 2, think of secretions; 3, think of the state of general system; 4, think of the conditions of other organs, especially of skin, liver and kidneys. Doctor Howard divides states of disease into 2 great groups: 1. If there be constriction, dry cough, slight fever, then give expectorants, Ant. Tart. gr. $\frac{1}{4}$ th to $\frac{1}{2}$ th. Give alkalies. Combination, for they liquify the secretions and render them free, as Pot. Cit. If patient be old, give Am. Carb., it stimulates. Sedatives to add must not dry the secretions in this dry stage, hence avoid Opium, Bellad. and use Chloral, Hemp Hydrocyan. Ac., Hyoscyamus, Apomorphine gr. $\frac{1}{4}$ th (last is good). 2. The other group has little or no fever, expectoration is free, sputa now purulent, so this needs checking, so use stimulating expectorants, balsams as Canadian Copaliba or turpentine or Tereb. in capsules. In elderly people, or if secretion be profuse, give Mist. Am. $4\frac{1}{2}$ oz., Tr. Camp. Co. $\frac{1}{2}$ oz., Syr. Tolu. 1 oz., $\frac{1}{2}$ oz. every 4 hours, also tar water and tar pills are good to check copious expectoration. Terpene in pill form is also good, gr. 15 to 30 in a day. Full doses of Quinine and Iron will sometimes act as an astringent. In cases of fetid bronchitis, Oil of Sandalwood m. 5 T. I. D. will often act well, checking fetor as well as secretions. Carbolic Acid is also good for the last. Give as below Ac. Carb. m. 10, Tr. Camp. Co. 2 oz., Syr. Virg. Prunes 2 oz., Glycer. 2 oz., Sig. 1 dr., before meals and at bedtime. Inhalations are also given, brings drug into direct contact with the mucous membrane. Keep a jug of water at 140, and inhale steam with vapor of Oil of Scotch Pine. Carbolic Acid or common turpentine is also very good, but moist inhalation is not as good as dry, for hot steam relaxes the throat and leads to congestion. Use only in dry stage of bronchitis, so dry inhalations are best. Coghill's Inhalation—Carb. Ac. 2 drs., Tr. Iod. Aeth dr. 2, Thymol or Creasote dr. 1, rectified Spts. of Wine 3 drs., or you can use Eucalyptus Oil m. 10 to 15 on sponge, or Creasote and Alcohol. Terebine is also good, 5 to 10 drops on inhaler. In those cases of bronchitis associated with bronchial spasm add 16 to 20 gr. doses of Pot. Iod. and Pot. Brom., and addition of Bellad. is also good. In many cases of obstinate bronchitis only change of climate will aid. If patient be delicate, do not delay too long. A moist climate for dry expectoration, and dry climate for moist expectoration. Plenty of outdoor exercise to be given them, tonics of all kinds. The inhalation of compressed air in emphysematous bronchitis sometimes helps. Salicylates or Colchicum or alkaloids for rheumatic or gouty cases.

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PLASTIC BRONCHITIS (Membranous) is very rare, is met with chiefly in delicate young adults, especially tuberculous; sometimes occurs in children suffering from bronchial catarrh. Peculiarity of disease is a diphtheritic-looking membrane, forms not in trachea but in bronchi, may completely line bronchi, may form cylinders. This membrane is formed of coagulated lymph. This disease is acute (rare) or chronic. The acute form is attended with fever, symptoms are like the ordinary acute bronchitis. But soon great symptoms of dyspnoea ensue, paroxysm of cough, asphyxia may threaten, hæmoptysis may be present, coughing will in a few hours bring up a tube cast in chronic form, violent coughs, paroxysms of dyspnoea and expectoration of casts, then an interval of 10 to 12 days, and attack repeated, it may last 1 to 2 years. The acute form lasts 8 to 10 days.

PHYSICAL SIGNS.—Rales, whistling or bronchial, or bubbling, but in certain portions there will be complete silence—there may be dullness there also; at any moment pneumonia might set in, with its signs complicating above.

PROGNOSIS.—Acute form is serious, chronic form is not very fatal, is recoverable from.

TREATMENT.—Not much can be done. In very early stage treat as in acute bronchitis, inhalations of steam; in plastic stage still continue inhalations of steam, of spray of lime water, or slacked lime in the room. Pot. Iodid. is recommended, also Ammon. Iodid. combined with *Am. Carb.* If any constitutional symptom be present it will need its own treatment. Change of climate may help. Bronchiectasis or dilatation of bronchi is a sequel of bronchitis; 3 varieties according to dilatation,—saccular, cylindrical and cystic, may get as large as an egg.

XVIII. EMPHYSEMA.

EFFECTS OF BRONCHITIS.—Emphysema is divided into: 1. True vesicular emphysema, in which the air vesicles are enlarged in diameter and atrophied in their walls. 2. Interlobular emphysema, in which air is extravasated outside of vesicles into the tissue. This latter emphysema occurs oftenest as result of traumatism, broken ribs, etc. It may run up mediastinum, neck, face, or all over the body. Besides traumatic origin, occasionally coughing (whooping cough) convulsive may cause it; air vessel ruptures and air escapes into the connective tissue of the lung. This air may infiltrate all over the body. As a rule air is absorbed, and recovery takes place. That is in the interlobular form.

TRUE VESICULAR EMPHYSEMA is divided into acute and chronic, but acute is over-distention, not true emphysema, occurs whenever a person is asphyxiated, drowning, capillary bronchitis, etc. This is insufflation, as mere overfilling of air vessels, no atrophy of wall. The chronic form may be general when both lungs are affected, or local when a small part is affected.

GENERAL EMPHYSEMA may be hypertrophic or atrophic, last form only occurs in old people.

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GENERAL HYPERTROPHIC EMPHYSEMA.—It consists of a dilatation of air vessels with atrophy of their walls. It begins by gradually unfolding of infundibuli, and thus progressing till the infundibuli connected to a bronchiole all unite to form one cavity. This large sac, by pressing against a neighbor, by atrophy or absorption of intervening wall, unites with it. This process continues till large sacculi form. At same time, by stretching the vessels in the wall, circulation is impaired, nutrition affected, hence atrophy both of lung and blood vessels. In the epithelium lining, air vesicles undergo fatty degeneration. Yellow elastic tissue loses its elasticity, so during expiration lung does not contract to expel air.

MORBID ANATOMY.—In general form lungs fill chest cavity and opening. On removing them are very light, contain but little blood, are pale, float high in water, are quite spongy along edges of lobes, and large vesicles are seen; surface vesicles are more enlarged than central, extending the symptoms. May exist for a long time without knowing; perhaps only symptom will be shortness of breath after exertion. Besides permanent shortness of breath he may have dyspneæal paroxysms, due perhaps to bronchitis, asthma, over-loaded stomach. A cough from bronchitis may be symptom complained of. Sputa may be ceroid or mucopurulent.

APPEARANCES IN LATER STAGE.—Countenance bloated, puffy, eyes prominent, feet are scorched, lips thick and livid. A sad depressed expression is noticed, muscular strength is lowered, voice is low, cannot speak loud for long time, gradual failure of circulation and respiration is also shewn by the livid extremities, shape of chest may be altered, bulging where the process is barrel shape, or back may be round.

GENERAL SYMPTOMS are weak and slow pulse and respiration, rt. heart is hypertrophied, hence impulse can be felt on sternum; urine apt to be watery, frequently deposits oxalates, which indicate deficient combustion, look for these in all respiratory troubles. Albumen will be found when stage is far advanced, circulation weak.

PHYSICAL SIGNS.—On inspection, prominence of upper wall of chest, varying with intensity of process; very little or no expansion is seen, only up and down movement; direction of ribs shew they are held up, are horizontal; rib spaces may be natural, level or higher, but lower in atrophic form. Percussion gives a hyper-resonant note tympanic, percussion shews lungs are enlarged, resonant area is larger, superficial cardiac region obliterated, heart pushed down to the left, impulse at ensiform cartilage, due to the dilatation of lungs shoving heart, lungs behind reach to level of 12th rib. Auscultation gives feeble vesicular sound, but little air is moving, for vesicles are already filled. Occasionally the opposite is heard,—hissing, roughness due to a mild degree of catarrh of finer bronchi. Also alteration in duration of inspiration and expiration. Inspiratory act is normally 4 to 1 expiratory, but in emphysema it is reversed. Heaves in horses is emphysema. Again sound is not heard with first movement in inspiration. Is called deferred breathing. Heart sounds are heard feebly, impulse feeble. Palpation and auscultation shew vocal resonance and fremitus diminished.

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EFFECTS OF EMPHYSEMA.—Right heart hypertrophies. This is followed by toughening and fibroid change in the heart. This causes mal-nutrition of heart's muscle and fatty degeneration, hence dilatation of right ventricle and with it tricuspid regurgitation, hence venous congestion (systemic). Leads to dropsy. Viscera all undergo fibrous change, fibroid lungs, kidney (cardiac), cirrhotic liver, impaired digestion, etc., all symptoms of valvular disease of heart. All blood is more or less serous, hence general mal-nutrition. In later stages there are obstructions to pulmonary circulation by œdema, hydrothorax may cause bronchial catarrh.

COURSE OF DISEASE.—Proves fatal by asphyxia, or by general dropsy, or by coagula in heart or great vessels. This may ensue early or be prolonged. Emphysema may be produced by powerful expiratory efforts or inspiratory efforts. Hence in chronic bronchitis is caused by violent coughing. For you first take in a full breath, close glottis, and then expire suddenly, when the expiratory act has overcome resistance of glottis. Hence unsupported parts of lungs, apices, bases, etc., get more air and get over-distended, ditto behind costal cartilages. But whole lung suffers. The coughing act in the badly nourished lung will finally have effect. When caused by inspiratory act, in old people cartilages are ossified, etc. Muscles strong, so expiration is not complete, air is retained, hence distention. Compensating emphysema follows on reduction by collapse of some part of lung, otherwise a vacuum would result, so phthisis is always accompanied by compensating emphysema.

CAUSES OF EMPHYSEMA.—Usually some form of bronchial catarrh, usually dry form from hard coughing, also in whooping cough, spasmodic asthma, even severe efforts of lifting, running, blowing wind instruments, etc., may cause it. Then compensating causes. This disease is sometimes inherited, the child inherits a modified state of nutritive lung tissue, hence ordinary exertions cause emphysema in child. Same applies to bronchitis—it weakens, hence predisposes to emphysema, cough being active cause. Dr. Delafield of New York teaches a new doctrine, that emphysema is a chronic interstitial pneumonia affecting walls of air cells; denies altogether inspiratory and expiratory theories of causation.

TREATMENT.—Divided into curative, preventative and palliative. Cure is out of the question, so we should aim at prevention by guarding against the cause. Bronchitis, especially chronic, is the commonest cause, hence should guard against cold, should accustom themselves to daily cold bath to harden themselves against cold, should wear flannel to protect against cold. If already subject to bronchitis, should go to a warm climate in winter. Pine forests are good to those with moist bronchitis. The bronchitis should be carefully and actively treated. In this case Pot. Iodid. or Am. Iodid. added to expectorant mixtures are especially good. Ringer's Ipecac Wine Spray twice or three times per day, spraying throat is good. If spray is too irritating, dilute the wine. Among cough mixtures in emphysematous bronchitis avoid Chloral.

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should be in open air. They must eat only small meals, or often concentrated food, for a full stomach lessens breathing space. Stimulants may be needed for several effects. Try and restore general nutrition of body to prevent fatty degeneration. Iron and Arsenic are specially indicated for this, also Quinine. Digestive system may need treating. Correct every disturbed function.

PALLIATIVE TREATMENT.—Keep bronchitis relieved. A direct method, the inhalation of compressed air, has been devised, a larger volume of air is so got in, relieves dyspnoea, heart's action stronger, dropsy disappearing, etc. But cure is not affected. Inhale condensed air, exhale into rarefied air, is the perfection of artificial breathing, machines are made for it. Pressure on chest during expiration is also resorted to.

ATROPHIC EMPHYSEMA occurs in old people in whom lungs are becoming atrophied. The tissue atrophying reduces blood vessels, and gives room for air cells to dilate.

MORBID ANATOMY.—Lungs small, cartilages ossified, hence lack of expiratory power.

SYMPTOMS.—1. Shortness of breath. 2. Reduction in size of chest. The shortness of breath is not much felt, for old people do not exert themselves and have less blood.

PHYSICAL SIGNS.—Such lungs are as when we expire. Lower intercostal spaces narrowed. Respiration short, recoil instantly after inspiration. Both inspiration and expiration are short. Percussion nothing special. Cardiac dullness increased as lung is retracted. There is no hypertrophy of heart.

TREATMENT.—Supporting treatment. Tonics, etc. Not met often.

XIX. ASTHMA.

ASTHMA.—Definition—Asthma (spasmodic) (Bronchial Asthma) is a neurotic affection, characterized by paroxysmal and recurrent dyspnoea, and, according to general opinion, dependent of tonic spasm of muscles surrounding small and smallest bronchi. It is held by some to depend on spasm of diaphragm (diaphragmatic asthma), and perhaps of other respiratory muscles. In pure asthma there is no lesion, simply a spasm of muscles, but is often associated with bronchitis; cardiac disease is then a secondary affection. So asthma is a neurosis. What is a neurosis? A functional affection of a nerve centre or nerve, no gross lesion can be distinguished.

SYMPTOMS.—Often preceded by various prodromata, but may set in all at once, especially in that variety which sets in after first sleep. A common premonition is disturbance of stomach, acidity, bad taste, coated tongue, or feeling may be in intestine, diarrhoea, flatulency, or vesical desire to frequently micturate, or highest centres may be first disturbed, hence headache, drowsiness, mægrim, delirium, loss of consciousness, etc. Whether these symptoms precede or not, the actual invasion is sudden. Patient feels he is suffocating. This sense may be from mere oppression to strangulation. Patient sits up, knees are drawn up,

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patient leans over, chin in hands. All muscles of respiration are acting, both ordinary and extraordinary. The respiratory act is labored—both expiration and inspiration slow, 12 per minute. Pulse slower than normal, countenance indicates distress, lividity, blueness of extremities, coldness, profuse perspiration. General temperature falls from deficient oxidation. Voice feeble, husky, eyes staring, face flushed. During attack urine is limpid, copious as in hysteria; as it passes off, urine gets scanty and deposits lithates in abundance. As a rule after fit there will be a deficiency of urea and chlorides since metabolism was not in excess. Air expired is loaded with CO_2 . This struggle for breath may last 10 to 15 minutes and 2 to 3 days. As spasm passes off expectoration ensues, sputa may be like jelly, red blood, or it may be more liquid, yellow, ropy mucus (humid). The sputa in many cases contains "Charcot's" crystals and little spiral casts. The only disease of lungs in which crystals are found. After fit patient is exhausted, sore, as after hard work.

PHYSICAL SIGNS.—Chest—great heaving movements, but base is drawn in spaces. Capacity of chest does not vary much, for quantity of air is but little. Percussion normal. Auscultation, whistling rales, due to narrowing of tube. If you exhaust patient's chest by making him speak for a while the spasm of bronchial muscles will cease, and breathing will be normal for 2, 3 to 4 times.

THE COURSE of spasmodic asthma is characterized by recurrence of spasms with complete cessation of symptoms in intervals, like epilepsy; there seems to be an accumulation of nerve force, spending itself in this nerve storm when exciting cause presents. This tendency to recur is confined by repetition, for the oftener it recurs the oftener it will recur. It is probable some essential change is produced in nerve centres by first fit, hence recurrence. Genuine spasmodic asthma occasionally passes off, but gives place to some severe form of other disease, as Angina Pectoris. It sometimes alternates with gout, eczema, urticaria, migraine, paralysis, epilepsy. So one neurosis may be the pathological equivalent of another. Effects of asthma: patient apt to be stoop shouldered, the bronchial muscles hypertrophy; if there be attendant bronchitis there will be contraction of lumen of tubes. Emphysema is one of the most serious effects, hence hypertrophy of rt. heart, dilation, tricuspid regurgitation, venous obstruction and sometimes thus dropsy. There is no organic change in nerve centres to account for asthma.

CAUSES.—Divided into centric, direct or eccentric.

CENTRIC CAUSES.—Through nerve centres, all powerful mental emotions, the depressing passions, exhaustion, organic diseases of nerve centres, as tumor; also causes acting through blood, as uræmic asthma.

DIRECT CAUSES.—Pressure upon nerves supplying bronchial muscles, as aneurisms, pressing on vagus, or on phrenic nerve in diaphragmatic asthma.

ECCENTRIC CAUSES.—Any reflex, from irritating (peripheral) acting in centres involved in asthma. Thus from stomach, from indigestion, bad food,

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pickles, pork, also flatulence. Odors, as hay asthma, thus acting through nose, excess of ozone in air, or changes in temperature may be the initial impulse to the reflex. Dust in atmosphere, bronchitis, emphysema may act reflexly, causing asthmatic spasm. A striking case to prove above is: a gentleman had long been troubled with asthma, coughed up a grain of shot, and asthma ceased. Causes due to specific causes may act directly on nerve centres, or act reflexly by irritating sensory branches of vagus in bronchi. How skin disease is doubtful, may be only a reflex. An interesting source of asthma is nasal polypi, or excessive hypertrophy of mucous membrane of the turbinated bones. Cure of these cures asthma, hence in every case of asthma always examine nasal cavity. But for slight causes, odor of a rose, etc., to set up asthma must require a predisposition to asthma, a preternatural irritability of nerve centre. This predisposition is hereditary, but not asthma; is not confined to any neurosis, epilepsy, etc. Predisposition may be induced, and an attack of whooping cough, measles or bronchitis is especially liable to leave tendency to asthma. Also exhausting and debilitating states of body will bring about asthma, as excessive venery, depressing mental emotions, etc., through weakening of nerve centres. Of course they may merely light up an existing predisposition. As regards age, is commonest under 10 years, always then associated with bronchitis. After this is commonest from 20 to 40. After 50 there is little liability to develop asthma.

DIAGNOSIS.—Simple, attack is sudden, develop at once, attack is transient, and intervals free from disease, slight causes occasioning it, etc.

PROGNOSIS.—Seldom fatal in itself. Is not often cured, cure is more apt in children, not as apt to get secondary effects.

TREATMENT.—How to avert impending attack depends on cause. If this is known, remove cause. As if from acid stomach, take alkaline drink, as Spts. Am. Arom. dr. $\frac{1}{2}$ in water, etc. If due to indigestible food, give an emetic; if to constipation, give a purge; if to flatulence, give Sod. and Sod. Salic gr. 10 to 20 twice in 24 hours. If too cold, a hot bath (foot bath) and hot drink may avert. Sometimes violent muscular exertions may substitute the asthma by getting rid of excess of nerve force. Even a powerful mental emotion may in some cases arrest attack. Remedies to shorten and relieve attack are divided into several groups: (1) To diminish irritability of nerve centres, as Mydriatics, Bellad., Hyoscyamus, Stramonium, etc. This last is most popular. Smoke gr. 20 of powdered leaf, or 20 m. on blotting paper, and smoked. Acts promptly. Hypodermic injection is next best way. Belladonna is also good, especially if there is weakness of heart, give Atropine gr. 1—100, 1—40 per mouth, or hypodermically, or Tr. Bellad. m. 2 to 5, or Hyoscyamin gr. 1—120. Various patent medicines are devised: Belladonna, Stramonium, Poppy Leaves, Tobacco. *Grindelia Robusta* aa equal parts, first steeped in Sat. Sol. of Saltpetre, dried and smoked, or take Stramonium $\frac{1}{2}$ oz. Aniseed $\frac{1}{4}$ oz., Saltpetre $\frac{1}{4}$ dr. or gr. 5. Tobacco is a powerful agent in many cases, smoke till sick; but tobacco smokers cannot use

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it, for it is no good till sickness is brought on. It is a depressant, hence an objection. Pyridine m. 20 to 30, put on a plate and ignited, is advocated by French. Keep room closed and patient back from the plate. It leads to profound sleep and depression, even alarming—may be repeated T. I. D. Chloroform is a prompt agent to temporarily relieve spasm. Morphia is one of best agents to shorten fit, but danger of habit is too great to forget. The depressor motors are also useful, as Nitrite of Amyl, Bromides, Ipecac, etc. A good emetic of Ipecac often will cut short attack. Chloral gr. 15 to 30, 4 q. li., is often useful. The Bromides gr. 10 to 20 every 2, 3 to 4 hours are good, usually combined with Chloral or Stramonium m. 5 of Nit. of Amyl inhaled acts rapidly.

CEREBRO-SPINAL STIMULANTS.—Strong coffee, no milk or sugar, will sometimes prevent or shorten fit. The fumes of Nitre have long been used, dip blotting paper in strong solution of Nitre, dry, then burn in room. Smoke 4 to 5 in square at a time, either in a pipe or under nose. Spts. Ether Co. dr. 1 to 2 every two hours, or Ether dr. ss., or a big dose of whiskey or brandy, will often shorten the fit. Arsenic smoked has also a good influence to allay spasm; gr. $\frac{1}{4}$ Arsenious Acid in each cigarette of Nitre paper is also useful. All various combinations of cigarette are to be bought in drug stores. A dash of cold water on chest will often cause reflexly a deep breath, overcoming spasm. Putting feet in hot water and drinking cold water will often arrest it. Above are only for relief of spasm.

TREATMENT IN INTERVALS to prevent recurrence, etc. A change of air is needed. Select climate the opposite to that in which he is,—town for country, low for high altitudes, hot for cold, etc. As a rule, atmospheres containing dust are to be avoided, but sooty atmospheres are beneficial. High altitudes (Colorado) relieve a great many, not all. Sea air is suitable for hay asthma. Watch digestive organs, give dietetic rules. Do not go to bed with a full stomach, have an early evening meal—say 6 p. m. and bed at 11 p. m. This implies an early breakfast, easily digested, etc. Boiled and roasted meats are preferable to boiled and fried starchy and saccharine foods should be avoided, as they tend to produce acid. Tend to general constitutional states, treat gout, diabetes, skin disease (Arsenic), etc., if present. Sulphur and Arsenic for skin affections and local remedies. Tr. Canth. is useful in asthma associated with skin affections.

BRONCHITIS AND ASTHMA.—Endeavor to protect patients against cold by wearing flannels, sit in no drafts, avoid cold drafts, use cold baths, etc. If odor is caused by asthma, perhaps an inhalation of Carb. Acid and Iodine or Creosote would lessen the susceptibility of the nasal membranes.

NASAL CAUSES OF ASTHMA.—If you find any hypertrophy there, local treatment is demanded, use of galvanic coterie and strong solution of Iodine, such as Mandell's Sol. of Iodine, is in 3 different strengths: No. 1, 6 grs. of Iodine; 2, 12 grs.; 3, 24 grs. To each of these is added Pot. Iod. 25 grs. to No. 1, 50 to No. 2, and 75 grs. to No. 3. Chromic Acid is also very good. For stomach cause, correct acidity by an Alkali, or give Carb. of Bismuth; correct constipation.

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NERVOUS CAUSES.—Sedatives are indicated, the Bromides, also Iod. of Pot. This last gives best results, gr. 10 to 20 T. I. D. seems to have some specific action in asthma. Bromides allay sensibility of nerve centre, hence give combination of Pot. Brom. gr. 10, and Pot. Iod. gr. 10, and Liq. Arsenicalis, which is a nerve tonic also. Bellad., Stramonium, etc., may also be added to above mixture. R. Pot. Iod. gr. 5, Liq. Arsenic m. 2½, Tr. Bellad. m. 5 to 10, Spts. Ether Co. m. 40 to 60, Pot. Bromide gr. 10. A simple dose is to be given T. I. D. for months. You may call asthma an epileptic attack of bronchi. Both Pot. Iod. and Pot. Bromides are depressing; hence if it is administered for a long time, need tonic to counteract, hence Iron, Quinine, Cod Liver Oil, etc.

INHALATION OF COMPRESSED AIR, especially if complicated with bronchitis or emphysema, is valuable in asthma. Counter-irritation down spine is also practised.

XX. PNEUMONIA.

PNEUMONIA.—Congestion of lungs generally means pneumonia, but it is used ignorantly; true congestion is very rare. May be active, as in first stage of pneumonia; may be mechanical, cardiac, or passive when it attends debility, fever, etc. Pneumonia means inflammation of lungs. Forms are: 1. Croupous pneumonia, in which an exudation is thrown out into the air cells of coagulable lymph cells not involved (lobar pneumonia). 2. Catarrhal pneumonia, the epithelium lining air vessels proliferates, undergoing inflammation (lobular pneumonia). Both of the above may be acute or chronic. 3. Interstitial pneumonia—the interstitial tissue is involved, giving a fibroid lung, this is generally chronic. 4. Embolic when emboli produce local spots of pneumonia, an infarct first, going on to inflammation and abscess, this is common as in emphysema. 5. Dissecting pneumonia, rare. Is an acute inflammation extending from pleura along lymphatics to lungs, ends in suppuration, pus dissects out lobules from one another; is common in cattle, rare in man.

CROUPOUS PNEUMONIA—3 stages: 1, Engorgement; 2, red hepatization; 3, grey hepatization. At outset there is an active congestion of capillaries. Liq. Sanguinis is effused together with leucocytes. Later on the epithelium of the air vessels proliferates. Red blood cells also escape with leucocytes. This is the stage of engorgement. Lung will look redder than natural, heavier, is crepitant, pits on pressure, still floats, tears easier than usual; on cutting, a frothy bloody viscid serum oozes out.

STAGE OF RED HEPATIZATION.—Coagulation of exudation of cells, filling vesicles, leucocytes are accumulation, also red cells increasing, and at the same time the proliferation of epithelium continues. In course of time the effusion completely fill up lungs, hence lung is hepatized. Lung then looks red, the more recent the redder, the older the less red, for exudation lessens blood supply to parts. Lung is also solid, non-crepitant, sinks in water, tears very readily; torn

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surface looks granular, due to plugs of coagulated lymph; inner vesicles exposed. Exceptionally it is smooth, due to accompanying interstitial exudation; on incision no serum escapes, but a thick material.

STAGE OF GREY HEPATIZATION.—Red color gradually disappears, for tension of exudation compresses blood vessels, producing anæmia. The inflammatory products, leucocytes, blood cells, proliferated tissue cells are also undergoing fatty degeneration, hence yellow tinge; weight, of course, is increased, sinks in water.

SUBSEQUENT PROCESSES.—Resolution is most favorable—fatty degeneration of inflammatory products, coagulated lymph undergo mucoid degeneration, and all are liquified and absorbed into the circulation again. The tension being thus taken off the vessels, the blood current enters afresh into the impaired vessels, and œdema ensues, hence rales. Thus in 3 to 4 days the products of inflammation can be absorbed. At this stage lung is yellow, friable, exudation looks like pus. Abscess of lungs, gangrene, chronic cirrhosis or caseous transformations may result. First, suppuration—some say suppuration is not primary, but secondary, leucocytes degenerating and forming pus, hence abscess of lungs. Abscess of lung after pneumonia is rare, is after 5 to 6 weeks of pneumonia, varying in size from pea to fist. Abscess frequently communicated with the bronchus is evacuated, walls approximate, and cure is effected. It is thought abscess is caused by excessive proliferation of epithelium of walls of vesicles and great aggregation leucocytes. One says the cause is tuberculous. A third view is that it occurs when there is low vitality.

GANGRENE is also a rare termination of pneumonia. Occurs usually at about 6th day, generally localized, sometimes diffused, spot is dirty and greenish, tissue looks like rotting tow, odor very fetid, pleura also affected.

PROGNOSIS.—If spot be small, recovery is just possible; if large, impossible, for septicæmia sets in. Causes of this gangrene sometimes due to putrescent matter in dilated bronchi, but in simple pneumonia will depend on the intensity of the process; may depend on extreme debility of the circulation of the part leading to local stasis, as from weak heart. It is also apt to occur in drunkards from low vitality, also obstruction by thrombosis of some branch of the pulmonary artery.

COLLAPSE followed by cirrhosis of the lung may also follow pneumonia, caused by air not redilating vesicles after absorption of the inflammatory products filling them. Air obstruction. The bronchus would keep air out, absorption of inflammatory products may be incomplete, or a chronic state of inflammation remains, as in chronic nephritis, hence formation of fibrous tissue and cirrhosis. The induration may be in patches on surface or between lobules, or in larger areas, and leads to contraction and atrophy of that part of the lung.

CASEOUS DEGENERATION may be a sequel. Some pathologists deny, some affirm it occurs, is still in dispute; a caseous spot in the lung becomes a nidus for tubercle, some even say initiates it. A primary lobar pneumonia in a healthy man never caseates (Dr. Howard), a catarrhal pneumonia may.

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ASSOCIATED MORBID APPEARANCES.—1, blocking of smaller bronchi; 2, œdema of the lungs of inflamed part; 3, thrombus in the pulmonary arterial branches; 4, embolism of pulmonary artery; 5, viscera may be congested; 6, catarrhal stomach and bowels, diphtheritic exudation, etc.; 7, pericarditis by simple extension, or by blood contamination; 8, ulcerative endocarditis; 9, meningitis with purulent effusion (pyæmia); 10, pleurisy, plastic or dry, occasionally effusion. Pneumonia may affect a single lobe of one lung or both, usually it affects the lower lobe.

SYMPTOMS OF LOBAR PNEUMONIA always set in suddenly by a rigor, long and severe; now and then in a few cases there may be only a chill and sense of discomfort for a couple of days, or in children convulsions; rise of temperature rapidly follows rigor, may reach 103 to 104. Vomiting may take the place of chills at beginning, marked depression is common, pain in head may be severe, cough is usually early, and there is more or less dyspnoea. Patient looks ill. If pneumonia is secondary, there is not the sudden invasion as when caused by some fever. In occasional cases, physical signs may precede the fever, but only in those of broken-down constitutions.

SUMMARY OF SYMPTOMS.—Pungent heat of skin; pulse frequent, 80 to 120, small, quick, respiration 40, 50 to 60, thus altering pulse respiration ratio; headache continues, malar bone flushed on same side as affected lung; delirium is rare, may be in children and drunkards, and is commoner with apex pneumonia. Bowels usually constipated, tongue furred, appetite gone, thirst; vomiting is common too, slight or severe; urine S. G. high, excess of urea and uric acid and pigment, deficiency in chloride phosphates; albumen is also frequent, but not serious, and indicates a renal catarrh. Jaundice also may be present; if accompanied by a stupor or delirium, is serious. The causes of the jaundice are various: extreme pulmonary congestion obstructs portal circulation, sometimes there is catarrh of the bile ducts, or change may produce it (in blood); herpes on lip or face are common, and point to pneumonia in lung trouble. Pain,—there is always a stitch like pain in the side, lasting a day or so, but is not severe, and is due to pleurisy. Cough occurs early, is attended by a rusty expectoration, transparent, tough, viscid; cough is short and frequent, expectoration is scanty at first, but gets more copious, and finally gets a cake, less viscid, is not frothy, more abundant, mucopurulent. Expectoration is often absent, especially in secondary pneumonia, in delirium tremens, in old people, in apex pneumonia and feeble persons. Microscope shews casts of ultimate air vesicles, blood, etc., in expectoration. True pus cells are rare, never white; sputa are rusty, the blood, in pneumonia, contains an excess of. Sometimes actual hemorrhage occurs, even alarming. The temperature runs a special course, is high from the first, 102 to 104, oscillates a little, reaches its climax at 3rd to 6th day—104 to 106. There is an evening rise and morning fall, as in typhoid. This temperature also declines suddenly, a drop of 3 to 4 degs., and meaning permanent defervescence, but sometimes there is a slower fall.

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PHYSICAL SIGNS.—In first 24 hours there are no signs, but after that, if inflamed part be near surface, you will have a loud, dry, harsh, vesicular murmur. When exudation has taken place in air cells you will get dullness. This is due to absence of air and presence of exudation. Sometimes the dullness is tympanitic, due to infiltration of the lung tissues of part and diminishing of air in the air cells, that is condensation of lung tissue about open bronchi. Respiration is weak, crepitation is present, but is confined to the end of inspiration, is caused by the separation of the walls of air cells stuck together by effusion. In bronchiolitis there is also crepitation, also an œdema of lungs, pleurisy with effusion, voice may be already increased in resonance.

INSPECTION will discover less movement on affected side.

STAGE OF HEPATIZATION.—Inspection will shew less movement on affected side. The great physical sign now is dullness, varying in apex pneumonia; when dullness surrounds the larger bronchi you get a tubular dullness, for some reason amphonic dullness may be noted.

AUSCULTATION.—You hear tubular breathing, blowing breathing, no more crepitation, voice, there is bronchophony and echo reverberation caused by solid lung being a better conductor of sounds. Or vibrations of solid lung augment laryngeal vibrations. Crepitation is rare with children, but breathing will be weak, and in time there will be blowing breathing.

TERMINATION.—Resolution frequently, abscess or gangrene but rarely. Death frequently 1 to 6, in either red or grey age. This disease runs a definite course. First, high fever, lasting 5 to 7 days, is mild, and as long as 2 weeks in severe cases; then pulse becomes more regular and skin more moist, but the most notable fact is that the fever has left by a crisis in 4 to 16 hours; with children the fever does not end so rapidly, for it may take a day or two to subside. Again, you may have a remission of the fever at the end of a week, but followed by an increase in temperature and typhoid symptoms, the fever ending by crisis in 14th to 21st day, and patient rapidly convalesces. After a fall of temperature the physical signs of consolidation will consist; a few days after expectoration has thoroughly stopped a large quantity of matter may be coughed up, greenish, very fluid, mummulated, and you will find elastic tissue, fat, etc. After this expectoration you will often have a cavity left, which if connected to a bronchus can be made out. The expectoration often becomes fetid, and if the cavity be large the attack is very apt to prove fatal; but if small, the walls may approximate, or death may occur in 2 to 3 months from exhaustion of suppuration.

GANGRENE, when it occurs, does so early, in 5 to 7 days, and usually in persons of broken down constitutions, as drunkards, those badly housed, etc., and usually proves fatal. It is characterized with great prostration. The expectoration of a greyish green, mummulated, stinking and fetid. No elastic tissue is found in the sputa as it is dissolved. Bacteria will also be abundant. If unconnected with a bronchus it may not be made out. Serous exudation into pleural cavities may occur, not serious. Capillary bronchitis is often a com-

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plication, very serious, is most frequently met with in the extremes of life. In post mortem you will find caseated masses in the consolidated portions of the lungs.

SIGNS OF RECOVERY of hepatized lung. The dullness will diminish. Breathing changed, gets harsher, crepitation returns, and is more moist than primarily, heard in both acts of breathing. Delay in resolution sometimes occurs.

RESOLUTION.—Bluller's figures. In 150 cases of primary pneumonia, in 83 resolution took place in 6 days, in some in even 1; that is, duration of process of resolution, 47 took till succeeding week, 18 of these 47 taking 10 days, 6 of the 150 took 18 days, and none were over 3 weeks. In cases where patients are ill longer, then other causes operated. Osler notes a case where a year was required for resolution. Cases like them must be in persons of little vitality, tuberculous, etc.

DEATH.—The disease may prove fatal in 3 to 4 days where there is high fever and delirium, or at end of first week, by heart failure, especially in old persons. This may be very sudden, and happen during convalescence. But cardiac failure is more apt to occur in old or broken down people, and usually comes on gradually. The mortality varies with age, high per cent. in early childhood (5 to 10 years), 25 per cent. from 25 to 60 years, after 60 mortality is very great. More apt to be cardiac failure when there is sudden defervescence.

CAUSES, predisposing, are all causes which lower vitality, as intemperance, bad housing, severe injuries, mental shock, worry, etc. Exposure to changes in atmosphere, fatigue, etc. Age,—often occurs under 5 years of age. Sex,—most frequent in males (exposed), 30 to 40 years. Climate,—cold and changeable, especially if damp and windy. In Franco-Prussian war 25 per cent. of troops encamped in Mount Senis had pneumonia.

EXCITING CAUSES sometimes cannot be made out, but it is usually due to cold or exposure. This may not need to be severe, depending on the resisting power of the individual. Thus, one fatigued would resist effects of exposure less than when rested. No other causes of the disease may exist, but some say these are but predisposing causes, and that the exciting cause is a specific germ. Still, the pneumonia following the disease (other) is similar to the primary form, as that following measles or croup in children. It rarely follows bronchitis. It is common with delirium tremens, caused by exposure. Friedlander in 1883 isolated a germ, a micrococcus from pneumonic lungs. It was 1 m.m. by $\frac{1}{2}$ m.m., is usually encapsuled, and capsule may hold two in it or even a colony. But these encapsuled germs are found in pleurisy. But Friedlander also found germs or micrococci altogether different from above. These he cultivated, and by inoculation produced pneumonia in mice, but not in rabbits. The first kind also have produced pneumonia, but usually pyæmia. But pneumonia is not always associated with these micrococci. They say that different cocci will give rise to pneumonia, just as different cocci will give rise to pus, but pus formation is not a disease. And seeing that cold and exposure take such a part in bringing on

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an attack of pneumonia, we may consider the germ theory unproved. We cannot say that primary pneumonia is caused by a germ. Evidence of micrococci being cause is not at all conclusive.

DIFFERENT VIEWS.—Two views prevail respecting pneumonia: 1, it is a local inflammation caused by cold, giving rise to fever; 2, or it is a local lesion of a specific pneumonic fever. The alleged existence of a coccus favors this last view. They say these cocci go in and out with tidal air, if they penetrate farther the cilia drive them out; but if cilia are paralysed, then the cocci find lodgment, hence pneumonia. Reasons that pneumonia is a specific fever are: 1, it is typical, cyclical, self limited course; 2, fever sometimes precedes local lesion; 3, there is no constant relation between fever and extent of local lesion; 4, ordinary irritants traumatic, do not excite a true pneumonia; 5, it occurs epidemically sometimes; 6, the occurrence of a contagious form occasionally; 7, cocci have been found in inflamed air cells, lymphatics of lungs and pleural surfaces, and by inoculation have given pneumonia to mice (?). 1, But although we cannot deny that pneumonia is a, 2, specific fever, yet epidemic pneumonia may be referred to a common cause,—the weather; 3, contagious pneumonia, Dr. Howard does not remember a case, does not spread from patient to attendant, etc.; 4, many cases of supposed pneumonia are not pneumonia; 5, pythogenic or sewer gas pneumonia has occurred as a local epidemic, sometimes contagious, but is not ordinary primary pneumonia.

DIAGNOSIS in stage of congestion may be confounded with bronchitis, pulmonary collapse and œdema of lung. But bronchitis does not set in as suddenly, has not so severe a rigor, temperature does not run up so rapidly, does not end by crisis. There is also a difference in cough and expectoration. Physical signs,—dullness in pneumonia, none in bronchitis. In pneumonia you have crepitation, then bronchial breathing. In bronchitis you hear bubbling, etc., rales, pneumonia is localized, bronchitis generally affects both lungs. Pulmonary collapse occurs generally when bronchi contain excess of secretion, as in bronchitis, paralysis (lungs not inflated). There is no pain as a rule, no rusty sputa or local dullness, for as a rule only lobules are collapsed and neighboring lobules over-distended. So collapse is scattered, but sometimes a mass of lobules is collapsed, hence you would get a slight dull note with light percussion. Stethoscope gives feeble breathing or none, but extensive collapse would give slight blowing breathing. Collapse is generally a sequence of bronchitis, so look for bronchitis rales. The sites of collapse are parts most remote from trachea, as posterior parts of bases, but may occur anywhere.

ŒDEMA OF THE LUNG may puzzle to distinguish from pneumonia: 1, The rale of œdema as a rule is coarser and moister than that of pneumonia; 2, is not followed by positive dullness, although crepitation may be heard, so you will not have bronchial breathing. Œdema is apt to be symmetrical, but may predominate on one side if patient lies on one side. Sputa is thin, frothy, serous, not at all like pneumonic. It is a non febrile state, no pain. Its causation is different,

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as valvular disease of heart, or Bright's Disease, or anæmia, purpura, etc., and it will generally be part of a general dropsy. In stage of hepatization, plenisy (in effusive stage) and hydrothorax may be confusing, will be treated of when we come to them.

PNEUMONIA OF APEX occurs in old people, etc. Do not call phthisis, for pneumonia is an active febrile disease, but phthisis is a chronic disease. In pneumonia you have symptoms succeeding rapidly,—crepitation, dullness, bluish breathing, etc.

TREATMENT.—Modern treatment resembles that of any fever, merely attempting to control: 1. Put patient to bed, and make him stay there, to save strength. 2. Give patient a good nurse, save his strength, use a bed-pan, urinal, etc. 3. Temperature of room, 64 is hot enough, no drafts, but ventilation should be good. During first few days fever high, give gruel, milk, broths, etc. But in occurrence of hepatization (fever then subsides), then give supporting food,—meat broths, egg nog, etc., for resolution goes on better if patient is well fed. Severe pain in side lasts only one day, apply hot stupes, or inject Morphia gr. $\frac{1}{16}$ th to $\frac{1}{8}$ th. This pain is on first day. Some attach great importance to Morphia to allay shock of pneumonia to vital powers, so in severe cases give Morphine $\frac{1}{16}$ th to $\frac{1}{8}$ th by mouth T. I. D. for 2 to 3 days. As a rule this is not called for. Bromide will often do just as well as Morphia. Majority of cases in healthy man will do with previous treatment. Not so with severe cases.

MEDICINES.—Liq. Amm. Acet. dr. 2 to 4, and Pot. Cit. gr. 5 to 10, or Pot. Bicar. every 2 to 4 hours. Give a purgative at outset,—Ol. Ricini or Calomel gr. 5. Bleeding and Aconite are not now used. In elderly or weak people, especially if in malarial district, give Quinine grs. 2 to 5 every 4 hours along with Liq. Amm. Acet., etc. It seems to be an antiphlogistic. If stomach will not retain Quinine give per rectum. When pneumonia is of typhoid character you must give Quinine. Pneumonia is often accompanied by disordered stomach, vomiting, etc., so give Soda gr. 3, and Calomel gr. $\frac{1}{4}$, every 4 hours. When hepatization occurs still give Salines and Quinine, improve the diet and give cardiac stimulants, as wine, Digitalis, especially if there are signs of cardiac failure. If hepatization is but slowly resolved, add Iron to Quinine, and give abundance of nourishing food. Some recommend alkalies. Externally apply blisters, or paint with Iodine, or apply turp. stupes, will hasten resolution. It is a special indication through pneumonia to sustain heart, especially in old people, drunkards, etc., so give alcoholic stimulants,—Musk, Camphor, Ammonia, Digitalis, for heart failure is the great danger of pneumonia. High temperature, over 105, favors heart failure, so antipyretics are needed; give Quinine grs. 20, for it is also a heart tonic, or give, if it fails, Antipyrine or Antifebrine, or if these fail give cold sponging, cold pack, or ice cap to head. Antifebrine gr. 6, Quinine Sulph. gr. 5, make a very good antipyretic. If in early stage you find marked dyspnoea, heart yet strong, patient rigorous, then he may be bled, is due to congestion of lung. Patient will have lividity, dyspnoea not accounted for by fever, pain or extent of inflammation, breathing will be



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rapid, and there will be abundance of frothy, bloody expectoration. It means collateral congestion of the lung, not pneumonic. A moderate bleeding, 10 to 12 oz. of blood will often lower this congestion. This state is not often found, should be so treated. A new treatment (French), based on doctrine of bacteria, consists of injecting directly into hepatized lung of 20 to 25 c. c. of Corrosive Sub. sol. of strength of $\frac{1}{40000}$. Do this in 3 to 4 places. Is not fashionable yet. Do not try.

TREATMENT OF GANGRENE AND PULMONARY ABSCESS.—On their occurrence, at once give stimulant treatment,—ale, wine, e/c., strong broths, etc., and tonics, as Quinine, or Tr. Fer. Mur. m. 10 to 20, or if heart is low give Ammonia. Turpentine in capsules every 2 hours is valuable, checks fetor and secretion. Inhalations are also used. Turps or Iodine, Carbolic Acid, Thymol or Creosote should be used constantly to lessen secretion, fetor, decomposition, etc. Modern surgery opens such a gangrene or abscess. 1. Find out by percussion and auscultation the exact spot, and draw a circle over centre of zone, then define its edges to where it joins healthy lung. 2. Make an incision along lower margin of rib corresponding to centre of circle, drive in a fine silver trocar, and foetid gas escapes. Then dissect down to pleura; if lung is not adherent to pleura wait 2 to 3 days till it is, withdrawing trocar and closing wound. Then when adhesion is found to have taken place, thrust in trocar, then a sharp bistoury along it, then follow with forceps, and dilate them, put in a drainage tube, and treat antiseptically.

CATARRHAL PNEUMONIA, or lobular pneumonia or broncho pneumonia.

CAUSATION.—1. Is especially apt to be an extension of bronchitis, especially capillary bronchitis. Even a coryza may extend down. 2. Often is preceded by collapse of lung, some say it depends on lobular collapse, hence following capillary bronchitis. But collapse arising from weak inspiration, also hypostatic pneumonia, are but catarrhal pneumonia. 3. Aspiration into air vesicles of inflammation products from above as in bronchitis. In animals, division of vagi, larynx being insensible, allows particles of food to get into lungs, thence into alveoli, and cause catarrhal pneumonia. 4. Closely allied to above is pneumonia caused by inhalation of dust. 5. Conveyance of septic matters by blood vessels into lung may excite local catarrhal pneumonia. 6. Tubercular deposits, by mere extension, excite catarrhal pneumonia. 7. Even a simple cold may cause a primary catarrhal pneumonia.

PREDISPOSING CAUSES.—1. Age,—is a disease of childhood, under 3, and of old age. Between 5 to 16, 25 per cent. of cases occur. It is a comparatively rare disease in middle life, except in paralyzed or bed-ridden. Occurs only under extraordinary circumstances, hence phthisis is not caused by this. But probably many cases are overlooked and called febrile catarrh, etc. 2. Bad ventilation and overcrowding. 3. Rickets and any affection which weakens the respiratory power, perhaps by favoring collapse. 4. Various forms of atrophy in children.

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MORBID ANATOMY.—There are the same 3 stages as croupous pneumonia, congestive, red and grey hepatization. The main differences are: 1, In croupous pneumonia the disease spreads uniformly over a wide area, involving a lobe; 2, the exudation is of lymph, red and white cells, but little change of epithelium of air cells, etc. But in catarrhal pneumonia the process is different, diffused, lobules affected, lymph is scantier, very many white cells, not as many red cells as in croupous pneumonia, and lastly the great difference is in proliferation of epithelium of air cells in catarrhal pneumonia. Catarrhal pneumonia is in two forms,—patchy (disseminated) or confluent. Disseminated form, when lungs are opened, little patches, violet color, not crepitant, and in lower level are collapsed lobules. In a further stage these lobules are red, congested, a little raised, on incision a frothy serum escapes, gradually this red patch becomes greyer, even changing to yellow. Microscope at this stage in lobules will find a few red cells, white cells and masses of germinating epithelial cells, large nuclei. In this stage, of course, frothy serum is not found, but thick viscid pus. In all cases if you slit up bronchioles you will find them inflamed, shewing this disease is broncho-pneumonia. The disease starts with a bronchitis, then peri bronchitis, then effusion into contiguous air vesicles of fibrinous lymph and lymph corpuscles, epithelial cells proliferating, so vesicle is filled. Outer vesicles may also shew proliferation. Besides above, little yellow bodies from size of pea to hazel nut are seen on incision, are either ultimate bronchioles and air cells distended with insuflated pus, or else of pus formed there, degeneration, are tiny abscesses, do not mistake for tuberculous nodules. Patches of "emphysema" compensating are also found.

CHANGES OF PROCESS OF DISEASE.—Same as croupous, one point of difference is that caseation is often the result. To go over again, resolution may occur, products expectorated, etc. 2. Caseation may occur. Chief cause is great production of cells in alveoli and in septa, walls, etc., cutting off blood supply. This caseation is apt to occur in old people, children after measles, in the debilitated, etc. This caseation is common only in special circumstances. Dry caseous necrosis (pulmonary) occurs generally as a sequel of broncho-pneumonia or bronchitis, but only after measles or whooping cough in children. But it may occur in adults. It most frequently occurs as result of tuberculous affection, also in other forms. So in a given healthy person caseation is not apt to occur. 3. Ulceration as softening of caseous mass, a cavity results. 4. Fibrosis, a chronic fibrosis of lung frequently originated in catarrhal pneumonia. 5. Emphysema, compensating, often found. 6. Miliary tuberculosis often a sequel. Either the broncho-pneumonia was of tuberculous origin or else gives a good nidus for tubercle bacilli. 7. Pleurisy, local. The confluent form of catarrhal pneumonia is apt in post mortem to be found, though lobar pneumonia is caused by junction of affected lobules. On close examination: 1, it is not as truly hepatized as lobar pneumonia; 2, different part will be in different stages, a mottling of stages in the different lobules.

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CLINICAL SYMPTOMS OF CATARRHAL PNEUMONIA are divided into acute, subacute and chronic forms. Acute form is apt to occur in course of capillary bronchitis, especially met with in measles. Symptoms are like capillary bronchitis, which see. 1. Invasion sometimes is ushered in by a rigor. 2. Invasion is sudden, temperature rises rapidly—104 to 105. 3. Great frequency of pulse, 120 to 160, and respirations 40 to 60. All respiratory muscles in action. 4. The paroxysmal cough changes to a short, frequent cough attended with pain. Usually children will not expectorate. An emetic will bring up phlegm, not rusty. 5. Pallor gradually changes to lividity, cough gradually ceases, heart rapid, coma gradually ensues, etc., and death. It is a very fatal disease, duration of attack short. In children under 18 months will prove fatal in a week. Ordinary attack is 14 days. Recovery may take place, but relapses threaten. Subacute form, as after whooping cough, rigor may not be marked. Temperature rises, but not quite as high; the “kink” of whooping cough changes to short, frequent cough. Physical signs are more marked than in acute form, for more time is given. Appetite fails, thirst, restlessness, sleep, constipation, desquamation of skin, etc. Relapses are common, emaciation ensues. The disease (subacute) may last several months, or may pass into chronic form, ending in fibrosis or phthisis. Chronic form may be primary, or follow acute or subacute form. Generally occurs in adults or old people. Is very apt to be confounded with phthisis, hence examine sputa for bacilli.

PHYSICAL SIGNS.—Disseminated form—if seen early you will recognize capillary bronchitis, which of all diseases is apt to pass into pneumonia. Percussion will shew scattered dull spots (stroke must be light), especially in scapular and interscapular region and on both sides. Auscultation—breathing sounds feeble, marked by fine bubbling. But faint blowing breathing may also be heard in expiration. If a patch be close to surface you may in this spot get tubular breathing. Vocal fremitus exaggerated—bronchophony. In confluent form you will have decided dullness, blowing breathing, increased vocal resonance. This form will often be unilateral, same as lobar pneumonia, or disseminated patches may elsewhere be found. Vocal fremitus in children is not noticeable, but is in adults. This form is apt to occur in chronic cases and run chronic. The hyperacute forms of broncho-pneumonia have only signs of acute bronchitis, for time is not sufficient for development of pneumonic symptoms.

COMPLICATIONS—Capillary bronchitis is always present. Pleurisy often complicates, hemorrhage into structure of lung, do not give rise to special symptoms, as bloody sputa. Catarrhal croup is also frequent, attended often by spasm of glottis. Pulmonary gangrene is also sometimes met with, as after measles or typhoid. Pulmonary abscesses—if a predisposition exists to phthisis, then this disease is apt to light it up, lessens the resisting power. Fibroid phthisis is also apt to complicate, and is attended with dilatation of bronchi. This disease is liable to lead to general weakening of entire body.

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TREATMENT.—Present capillary bronchitis developing into pneumonia. Every child or delicate adult suffering from bronchitis, measles or whooping cough should be kept in house; if delicate, in one warm room. In first stages keep in bed, ditto if attack is severe. In convalescence when child goes out have it warmly clad. Prevent accumulation of inflammatory products in the bronchi, hence favor cough and expectoration. Give an emetic in bad cases, one in a.m. and one in p.m. Emetics also act as expectorants. The emetic should be stimulating, as Ipec. Pulv. gr. 5 for infant under 6 months, gr. 10 if over a year. Put child in erect posture; emetic acts readier. Give drink to fill stomach. Add Am. Carb. to the Ipecac. Alum, Z. Sulph., etc., may also be used. Expectorants and alkaline salts are given from first. If child is weak give an Am. Salt, Liq. Am. Acet., or Ipecac. Vin. m. 5 to 10, and gr. 1 of an alkaline salt every 2 to 3 hours, if dose for child. In severer cases Tr. Aconite grt. $\frac{1}{4}$ every hour may be given. Watch effects, and stop. Pot. Iodid. in full doses in early stages, is good. If fever or debility give Quinine gr. $\frac{1}{4}$ every 4 hours to child, and gr. $\frac{1}{16}$ with Strychnine. When expectoration is freer add Turps. In early stages first week keep air of room moist, even hoop bed, and introduce steam. Opiates are poison, check coughing. Anise, Senega, are good to stimulate coughing.

EXTERNAL TREATMENT.—Poultices frequent, not too severe or too heavy, are good. Mustard plasters to redden, cotton wool jacket, Turps and Acet. Lin. rubbed in well.

DIET.—Support needed from beginning,—broth, milk, etc. Alcohol later on. In subacute and chronic forms treat as phthisis, change of climate, give tonics, as Cod Liver Oil and Iron. Let diet be good. Quinine, dry inhalations are also good.

XXI. PLEURISY.

PLEURISY is inflammation of the pleura, may be acute, subacute or chronic, may be diffuse or localized. The last is at apex or diaphragmatic interlobar or mediastinal. All serous membranes suffer the same operations in inflammation, as in pericarditis, peritonitis, etc. Inflammation as it attacks pleura has following steps: 1. Congestion. 2. Exudation of serum, migration of white cells, and occasionally proliferation of epithelium. Often connective tissue cells proliferate, or at outset of acute pleurisy the membrane is congested, red, has increased vascularity, then comes exudation rapidly coagulating. At first forms little transparent liquid masses on membrane, which enlarge, coagulate, fine delicate fibrils forming, thus forming a false membrane, rough to the touch and eye. There is also a migration of white cells, infiltrating and thickening the false membrane and rendering it opaque. Sometimes migration of red cells is seen, minute ecchymoses appear as in hemorrhagic pleurisy. In plastic or dry pleurisy organization may take place, the leucocytes forming embryonic tissue, and thence changing to cicatricial tissue, this also becoming vascularized. This vascularization is accomplished by budding of the capil-

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laries apart meeting a similar one and joining it. These buds are at first solid, then gradually soften and form hollow tubes, thus vessels, sometimes by joining and fusion of elongated embryonic cells tubes, are formed which join to buds of original vessels. Thus the cicatricial tissue becomes permanent. In mild cases of pleurisy the epithelium either remains intact or proliferates, and forms new material; but if inflammation be severe, the epithelium desquamates and perishes. When new tissue is formed it is called fibrinous pleurisy or plastic pleurisy. If movement be free, long strands of fibrous material are formed, bridges, otherwise adhesions are broad and flat. In many cases, serofulvous, etc., an effusion takes place, either serous or sero-fibrinous, rich in albumen, often readily coagulable on drawing off. It varies in quantity from 1 oz. to 2 to 3 pints. The fluid is always opaque from leucocytes, shed epithelium or shreds of fibrine (floculi). When there is effusion the serous parts are absorbed, the solid parts liquify and are absorbed. So long as fluid remains the inflamed membranes are separated, but on absorption of fluid these surfaces approximate and cohere. If you examine an inflamed membrane you will find a cohering layer; the outer part of this liquifies, but the deeper parts are composed of proliferating epithelium. A granulation tissue which approximated to opposite surface unites, binding lung to spot by the cicatricial forming. Another change is the inflammatory products may degenerate and form pus. Sometimes the exudation is primarily purulent, as in empyema, so you may have either primary or secondary pleurisy, even the pus may be absorbed, and afterwards surfaces unite. The pus may escape by ulceration and perforation of the parietes, leaving a fistula or perforation of lung and leaving a bronchial fistula; or it may perforate the diaphragm, setting up fatal peritonitis, or perforate a hollow viscus, and escape by stools. If chest be completely filled with fluid the lung will be completely collapsed, becomes airless. In early stages it may be re-inflated, but if left too long it will undergo fibroid degeneration.

SYMPTOMS OF ACUTE SERO-FIBRINOUS EFFUSION.—The disease sets in usually suddenly, rarely with a distinct rigor, never so distinct as in pneumonia. A pain stitch usually follows the rigor. The rigor is followed by reaction. Temperature 101, 102 to 103, rising slowly, not accompanied by great prostration as in pneumonia, no torpor, pulse rises slowly to 100 or 110, may be tense, but is usually soft and compressible. There is fever with its symptoms, urine is also highly febrile, deficient in chlorides, while effusion is abundant. Albumen in urine is often present, but not as frequently as in pneumonia. Besides the pain there is often a dry short cough with no expectoration, and is due to the strain on the lung by effusion. Breathing is short and frequent, each inspiration increases pain. Hand may be held on chest to prevent expansion. Patient lies on the back or sound side at first, but when effusion has occurred then he lies on affected side, giving sound lung full play. The pain is stitch-like in character, lancinating, is aggravated by breathing, coughing, movement, etc. Usually lasts not longer than 48 to 72 hours, subsiding on appearance of effusion.

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DRY OR PLASTIC FORM.—Here there is no effusion. This kind is usually attended by not much fever, pain is the same, but constitutional disturbance is unmarked. Only local symptoms, very rarely a hyperacute form of sero-fibrinous variety occurs, sets in by a severe rigor like pneumonia, followed by typhoid symptoms, breathing even 40 to 50 urging dyspnoea, and unless relieved by aspiration will die.

PHYSICAL SIGNS.—1. Of early or dry stage—inspection, deficient expansion, jerky movements, percnssion normal in this stage. Respiration weak over affected side, as patient saves himself, and slight friction may be noted. 2. When plastic effusion, there is a marked rough friction sign in addition to above signs. Some dullness due to thickened pleura. 3. When serous effusion takes place signs will depend on extent of effusion, say it is to level of 3rd rib, fluid will be found lower anteriorly and posteriorly than in the side. At axilla rarely is fluid horizontal. This is owing to normal elasticity of lung and bearing weight of fluid. Of course affected side has deficient expansion. There will be dullness over the fluid, changing abruptly at line of effusion to a resonant note. The dullness is a flat, empty note, use a light stroke. Sense of resistance to percussing finger. Auscultation shews absence of vesicular murmur over dull area, gradually being heard as you approach unaffected part of pleural cavity. The breathing may be loud, distinct, harsh, even tubular. While listening over dull area ask patient to say ninety-nine. The vocal resonance is diminished over dull area, so is also the vocal fremitus.

ÆGOPHONY.—When the patient speaks you hear a bleating voice like a goat's voice, is transient, heard at lower angle of scapula, with moderate effusion. Displacement of the heart is an early sign, even when effusion is not excessive. Sometimes gives systolic basic murmur. Second class—effusion abundant.

SYMPTOMS.—The diaphragm is not displaced downwards, nor ribs out till fluid reaches 3rd rib, fluid then is too heavy for lungs' suction. Now the girth of that side will be greater, expansion less, intercostal spaces flattened and widened, and general view of side of chest smooth. Percussion, absolute flatness up to level of fluid, then resonance, sometimes tubular from condensation of lung about bronchi and bronchioles, hence their hollow note, sometimes amphoric. The mediastinum will be also displaced, dullness following. Heart will also be marked, with displacement even early. Auscultation,—no sounds till near top of fluid, then breathing is gradually heard, harsh to blowing; vocal fremitus is not felt over fluid.

EXCEPTIONS TO ABOVE SYMPTOMS.—It is sometimes difficult in children to distinguish pneumonia from pleurisy with effusion, for you hear respirations to great extent over the fluid, and often through the fluid you hear bronchial breathing and bronchophony. Also there is not so much displacement of viscera in children by the effusion. In adults peritonitis is sometimes felt, bronchophony and blowing breathing, etc. Reason is that lung is bound by previous adhesions at certain points. This area of adhesion gives lung sounds. Sometimes all over the

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effusion you hear breathing, bronchophony, etc., due to congestion and non-collapse of lung. Lastly, in percussion if you strike too strongly you may in some cases get resonant note through fluid of opposite sound lung.

Sometimes in good lung you have crepitating rales, signs of lividity and dyspnoea, due to temporary congestion, dangerous from syncope. Tap at once to save patient.

COURSE OF ACUTE PLEURISY.—1. Mild form is usually not extensive, at most an adhesion results. Whole course is over in a week in some such cases. In majority of cases, more or less serous, or sero-fibrinous, effusion takes place. Pain subsides in 2 to 3 days, dyspnoea may be noted. Patient lies then on affected side. Effusion increases for 15 to 20 days, stands still from 2 to 5 days, then absorption starts. Rapid at first, slow at last, taking 4 weeks in adult, 3 weeks in child. 2. In subacute form, it is mild throughout, fever slight, effusion great. Symptoms are: debility, pallor, shortness of breath on exertion, sense of oppression and fatigue on exercise. Patient often recovers without aid, but may need medical treatment, rapidly curing after aspiration. 3. Chronic form, either primary or secondary. The effusion tends to be fibrinous or purulent. There are really cases of pyothorax or empyema.

SECONDARY FORM.—The fever becomes hectic, morning remissions, pulse small and rapid, steady initiation, increase in pallor, dyspnoea. A dry cough generally, but sometimes muco-purulent sputa. Face tends to be puffed, perhaps affected side of chest, arm, leg, oedematous. In spite of this local oedema of chest there are no signs of intrathoracic tumor.

Occasionally pleura is purulent, primarily, as under following circumstances is found. Great intensity of pain and fever, very early asthenia, frequent recurring rigors, hectic symptoms. Children are more apt than adults to produce pus. Disease,—small pox, scarlet fever, pyæmia, Bright's Disease, etc., are apt to originate it. Also intemperance, scrofula, oedema of affected side of chest, pointing of contents of the chest as abscess (late). Aspiration may be needed to diagnose, do it with a hypodermic syringe. Some say vocal fremitus and bronchophony are less heard through a purulent effusion. What becomes of the pus? 1. It may be absorbed after fatty degeneration. 2. More commonly costal pleura is destroyed, and pus points in front between the 2nd and 5th intercostal spaces, near the sternum, may even pulsate. This escape may leave a parietal fistula. 3. More often necrosis attacks the pulmonary pleura, and pus is expectorated, perhaps 20 to 30 ozs. in a day. If aperture through pulmonary pleura be small, air will not get into the pleural cavity, but does if aperture is large, and pneumothorax ensues. If a large aperture be made, pus is coughed out in large quantities rapidly—put in a drainage tube. 4. Pus may enter lymphatics of diaphragm, and set up a fatal peritonitis, or may perforate diaphragm and produce umbilical psoas, or may get into mediastinum and point as deep cervical abscess, or may get into double pleural sac and cause a double pleurisy. 5. Empyema

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frequently ends by death from asthenia. If a copious effusion with aspiration has occurred, the surfaces will approximate and unite, cicatricial tissue will contract, flattening that side of chest, binding down lung, etc. This retraction generally is not permanent, but sometimes is. The deformity of pleurisy needs to be distinguished from lateral curvature by shoulder and nipple being down, scapulæ out behind, intercostal spaces obliterated, etc., in pleurisy. Heart displaced by retraction.

COMPLICATIONS AND SEQUENCES.—Pericarditis—local or extensive and general, latter generally fatal. Sometimes irritation sets up endocarditis. Croupous pneumonia sometimes attacks the good lung. Death from asphyxia. Acute collateral congestion of the lung is more common than above. All the pulmonary circulation is through the sound lung. There is then an incessant, bloody, serous cough. Coughing does not relieve dyspnoea, and cyanosis appears. Death from asphyxia. Physical signs are fine bubbling without dullness. Aspirating too rapidly induces this congestion. Cavity of chest is enlarged by evacuation, lessening resistance of pressure to blood through good lung. Double pleurisy as in Bright's Disease, cancer, etc., may occur.

SEQUENCES.—Fibroid degeneration—process begins in pleura, spreads to interstitial tissue, and hence fibrosis. Bronchitis may be predisposed to by adhesions. Tendency to phthisis—some say the unabsorbed caseous material predisposes to phthisis, but not proved. Dr. Howard thinks it existed previously and was not caused by the pleurisy; but a general tuberculosis may attack pleura and lungs simultaneously, hence a pleurisy and phthisis following. Only specific caseous material will cause phthisis. Emphysema compensating is often a sequence of pleurisy. Amyloid degeneration after a purulent pleurisy is common.

CAUSES OF PLEURISY.—Pleurisy is sometimes an idiopathic affection, attacking one who is perspiring while fatigued; but some say that this is impossible, that cold is only predisposing, and some other cause exists, perhaps not to be made out. A new doctrine is that all cases of pleurisy are tubercular in origin. Rather extravagant. All are agreed that traumatism may bring on pleurisy of which the products are apt to be purulent. Pleurisy is also an accompaniment of many diseases, as Bright's, rheumatism, typhoid, etc. The products are apt to be purulent, especially in the specific fevers. It is also apt to occur from irritation from lung, as pneumonia tubercle, cancer of lung, etc., or may spread from pericarditis. From diseases of mammae, liver, spleen, stomach, etc. From peritoneum in peritonitis, also from parietal abscess, caries of ribs. In above cases the pleurisy is apt to be circumscribed and plastic. The disease occurs at cold and damp seasons, more frequently in males, 5 to 3. Is more common in left than right side. Other diseases may be mistaken for it, as pleurodynia, neuralgia. This last if rheumatic is pleurodynia, but may be from overwork, tired muscles; carrying child on one arm causes myalgia of pectoralis and serratus. But this is a non-febrile disease. Pain sets in generally rapidly, but may come on gradually.

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The pain is more aggravated by movement of body than in pleurisy, is more painful on pressure and at points of insertion. And lastly there are no signs of pleurisy, friction or dullness. Another affection is intercostal neuralgia. This also is non-febrile. Patient generally belongs to a neurotic family, or person may be in bad health from leucorrhœa, anæmia, etc. Then course of the pain is peculiar, seldom affects one nerve, often from 6th to 9th, and can be traced along nerve; and if long standing two tender points will be found with each, viz., ante and post, sometimes a third axillary. The pain is apt to be paroxysmal and in intervals, the nerve may be numb, or seat of tickling. And here also there is absence of signs of pleurisy. In stage of effusion there are several diseases to guard against mistaking. Pneumonia in stage of consolidation. In pleurisy there is less mobility of side, in pneumonia more expansion. If effusion be copious, side is enlarged. Intercostal spaces flattened out, widened, side smooth. These are not seen in pneumonia. Palpation count 99, over fluid there is no vibration, over consolidation there is extra vibration. Percussion note, both dull, but different, flat in pleurisy, wooden in pneumonia. In pleurisy mark limit of line of dullness, line not horizontal, dullness higher in axilla, describing a curve when standing. Then put patient on back and the dullness will be changed in position. In advanced cases there will be in pleurisy a displacement of viscera, heart, mediastinum, diaphragm, liver; none of these signs are found in pneumonia. Auscultation,—silence over the fluid, tubular breathing over hepatized lung, ditto bronchophony. Sometimes ægophony is heard at angle of scapula in pleurisy. Sometimes you will get diffused breathing (blowing) through fluid: 1, at apex if pleural sac be full; 2, at back at root of lung, if sac be completely filled. If yet in doubt use the hypodermic needle. Still there are constitutional symptoms differing. In pleurisy rigor is not as severe, temperature does not run up so high, stitch is more permanent, cough is dry, prostration not marked. Then the course of disease is different. Pneumonic fever ends by crisis at 5th to 13th day. In pleurisy there is also great pallor, not as in pneumonia. Hydrothorax may also be confounded with pleurisy. Hydrothorax is dropsy, pleurisy is inflammation. Hydrothorax is generally accompanied by general dropsy, is usually double and apt to be symmetrical. Is a consequence of valvular disease of heart or Bright's Disease as a rule. Then there is no pain, tenderness or fever, unless you have acute Bright's causing the hydrothorax, and then you have fever. Friction sounds are not heard either. Cancer of lung may be confounded with pleurisy. Cancer affects lung in 2 forms: 1, Nodular; 2, infiltrating. This infiltrating form alone concerns us. In cancer the signs of consolidation are not uniformly distributed, respiratory sounds greater, intercostal spaces not so widened, —there is not the same amount of deformity from retraction with cancer. Expectoration of cancer is sometimes characteristic, resembles currant jelly, but occasionally you have constant hæmoptysis. Lastly, cancer produces signs of a tumor in the chest, intrathoracic pressure, as contraction of pupil on that side, difference in the pulse, œdema and varicose veins on that side of neck, hoarseness of voice if recurrent laryngeal nerve be involved.

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TREATMENT OF PLEURISY.—1. *Acute Form.* The old method of bleeding is not now used, unless in a vigorous man at outset of pleurisy. Leeching 10 to 12 over seat of stitch will often relieve the pain. But usual method is a hypodermic of gr. $\frac{1}{4}$ of Morphia, and then strap the chest; let straps follow course of intercostal muscles, diagonally. So splint the ribs as for fracture. Or if you have no plaster, then apply fomentations and poultices, cover with oil silk and fix with a roller around the chest. Leave with the patient some powders of Morphia in gr. $\frac{1}{4}$ doses, or gr. 10 to 15 Dover's Powder, taken every $\frac{1}{4}$ to 6 hours. Hypodermic is best. If fever be high, pulse high, use Aconite gtt. 1 to 2 of common Tinct. every hour or two, with Acet. of Ammonia. In stage of effusion use remedies to promote absorption. Pot. Acet. gr. 15, Pot. Iodid. gr. 10, Spts. Ether Nit. dr. ss. Syr. Squills is a favorite, or add Digitalis, Inf. Digit. dr. ss. This is as diuretic. All the Salts of Potash are good. Quinine gr. 1 to 2, and Digitalis gr. 1 to 2, are good if patient be weak. The chest is usually painted with Tr. Iodine dr. 2, and Glycerine and water aa 4 ozs., or apply on lint, and keep applied; or apply a long, narrow blister, Simple. Lyttæ, dress with wadding, etc. Putting in new place each time. Do not abuse blisters. If patient is of sound constitution, Dr. Howard thinks Calomel gr. 1 T.I.D. added to Digitalis and Squill's Pill is good. Do not salivate. Germans use it. If in 4 weeks signs of absorption are not visible, then aspirate (3 weeks in children). In early stage there is another method of treatment, give Pilocarpine or Antipyrine, sometimes leads to absorption. Another is salt cure. Dr. 1 Na. Cl. every hour. Do not let patient drink, take salt in $\frac{1}{2}$ tumbler of water. The "dry" cure is resorted to if patient will not allow aspiration. Diet is low, broths and milk in first stages, increasing as absorption sets in. It does not necessarily follow that aspiration cures, especially early operation. Often it needs repeating. You cannot always abort by tapping. In advanced stage and absorption going on, you need generous diet for support.

CHRONIC PLEURISY.—Acute form should be prevented becoming chronic, but given a chronic case, what is to be done? A very vigorous supporting treatment must be started. In addition to ordinary treatment, give Ol. Morr., changes of air, sea voyage, etc. If fluid is present chest must be tapped.

RE-ASPIRATION GENERAL—, when ordinary means to promote absorption have failed; or 2, when one side is filled and threatens other side, especially if severe dyspnea has threatened or occurred; 3, if empyema is suspected, use hypodermic syringe to diagnose, and treat surgically; 4, if chest is half full of fluid and does not go away, tap; 5, if there is (in double pleurisy) flu. enough to fill one lung, tap; 6, in Bright's Disease, elderly people, phthisis, tap.

WHERE TO TAP.—2 to 3 favorite sites for tapping: 1, in back below inf. angle of scapula, tap 2 inches above lower limit of sound lung; 2, if drainage tube is to be put in, go to axillary line, say half way, some say post axillary line about 6th rib or space. Advantage of side operation is patient can lie on back. Danger of tapping: 1. Syncope. 2. Cerebral embolism from clots in com-

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pressed lung. Caution—never perforate where you get a resonant note on percussion, or loud breathing, or if space be depressed (adhesion). You use the ordinary aspirator (oiled). In drawing off fluid do not try to empty the cavity at one sitting. When patient begins to cough (lung expanding), or pain is experienced from extending lung drawing on its adhesions, stop. There is also the danger of congesting the lung by causing vacuum, also there is danger of hemorrhage from same cause. After tapping, strap side of chest. If much pain, apply ice bag over wound. Keep patient in bed for couple of days to secure union. In withdrawing pus use antiseptic precautions, and dress wound antiseptically.

XXII. ACUTE EMPYEMA.

Pleural sac is an abscess. Treatment differs from a pleurisy. In children, 2 to 3 simple tapplings may cure. But as a rule mere aspiration does not cure, pus reforms, hence other treatment is needed. 1. Make incision, insert drainage tube, using antiseptic precautions, dress twice first day, once a day after. Dr. Howard dresses with tarred oakum. 2. Insert drainage tube, no antiseptic dressing, and irrigate cavity with antiseptic fluid. Condy's Fluid dr. 2 to 1 oz., or Sublim. Solution 1 m. in 3-5000. Others merely fill cavity with warm water to wash out. Always wash out with a fountain syringe. 3. Introduction of double drainage tube entering in front at 5th, out behind at 7th or 8th. Is painful. Only employed in obstinate cases of empyema. Above are for acute cases of empyema. Pus may have been in chest for a year. Lung is so bound down by adhesions after so long inflammation that it cannot expand if you withdraw fluid (pus) at once. So draw off with 3 to 4 aspirations (no drainage), and after each put in a compress to force wall of chest in, to diminish size of pus to cavity. If you find you are gaining nothing, then put in a drainage tube. But even still there is a cavity, lung will not expand. So "Eslander" (?) devised his operation to close the cavity. He cuts out a portion of several ribs. Then these approximate and lessen cavity of chest. The pns secreting cavity closes. Cure effected. In empyema when pus has burst through into lung, sometimes cure is effected by this escape. But oftener a drainage tube is needed, in a dependent spot.

EMPYEMA IN CHRONIC PHTHISIS where a pyo-pneumo-thorax is present. At first you do not interfere. The air getting in collapses the lung, and so you hope the air hole will be closed. But if effusion becomes very copious, or septic symptoms arise, then drain.

XXIII. PHTHISIS.

PULMONARY CONSUMPTION, or Phthisis, or P. Tuberculosis. The doctrine of the day is that tuberculosis is an infective disease, induced by presence of specific bacillus. This entering tissue may induce a tubercle, a circumscribed inflammation, or may excite a diffuse granulation called infiltration. In both forms the specific bacillus is present. The granulations of tubercles are characterized by

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following characteristics : 1. By disposition to suffer retrograde changes, as caseation, necrosis, ulceration, and by its tending to form nodules composed of cells but no vessels. Non-vascular, hence perishable. 2. Inability to develop into permanent tissue. 3. By its infectiveness. Not only locally invasive, spreading by contiguity, but also by lymphatics and blood vessels, hence infects body throughout, as cancer, syphilis, etc., producing lesions similar to initial lesions, and in these secondary sites same bacillus will be found. 4. Transmission by inoculation of the specific poison, producing same disease, presenting all anatomical and clinical features. Recent pathologists place tubercle among the infective granulomata. To this group also belong syphilis, lupus, leprosy, glanders, actinomycosis. All owe origin to a specific virus, introduced from without into body.

CLINICAL SYMPTOMS.—Phthisis is divided into inflammatory and non-inflammatory forms. Under the inflammatory we have two subdivisions—ordinary chronic phthisis and the acute inflammatory phthisis (softening). The non-inflammatory phthisis is the acute miliary tuberculosis, whole body invaded. The chronic form is mingled with acute outbursts.

CHRONIC PHTHISIS.—At early stage there may be symptoms of impaired health before symptoms in lung. Perhaps earliest sign is emaciation and elevation of temperature above normal. The emaciation is gradual, and has no apparent cause, proceeds steadily. There may be an accompanying acceleration of pulse, in p. m. 90. Temperature rising in p. m., normal in a. m. The variation is 1.5 to 3 deg. Pulse rate rising with temperature. At this stage there is apt to be a chilliness, cannot resist cold. Perspirations, some smelling, in night time may be noted. Nervous symptoms, as irritability, etc., denoting a declining in vigor may be noted. There may also be occurrence of stitch-like pain in upper parts of chest, behind clavicle or scapula. Dyspnoea comes on gradually, often a persistent increase of respirations. A cough may set in, dry, hacking, or muco-salivary looking. Hæmoptysis may also be an early symptom. But invasions may be more sudden than above common way. Dyspepsia is a common mode of invasion, note a dislike for fats, sometimes for sugar. This is most common preceding acute form. Hæmoptysis is another mode of invasion. Now and then a patient in apparent good health will spit blood, due usually to extreme exposure or exertion, but it may be preceded by failing health. Then patient may be in bed, or walking, etc., no unusual exertion when he begins to spit blood. If expectoration shews bloody streaks in mucus spit up in morning, it is usually due to throat disease, catarrh, also from anæmic girls. Patients may spit blood from mitral valve disease, and also hysterical patients may spit up blood (?). Also menstruation may be vicarious, then hæmoptysis will be monthly. An anæmia might also cause it or cancer. Blood spitting is regarded as a sign of impending phthisis,—is serious. The first sign of phthisis may be hemorrhage—is then copious, pint ss. to 1. May be due to latent disease, or congestion due to tubercular irritation. Hemorrhage into the lung does not necessarily induce phthisis. It may accumulate in air cells,

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undergo fibroid or calcareous degeneration. A cavity may be left by the dislodging of one of these masses, not a true tuberculous cavity. But the hemorrhage may set up a broncho-pneumonia which favors the entrance of the bacilli. A protracted cough may be another mode of invasion, dry at first, then scanty sputa streaked with yellow from inflamed bronchi. But the physical signs are not those of bronchitis. May be confined to certain areas not near base, etc. A catarrh of apex suggests phthisis. Always suspect a prolonged cough without bronchitis signs. This cough is almost always attended by elevation of temperature. Ordinary bronchitis is not a mode of invasion of phthisis, for it is not an ordinary bronchitis, but specific. Catarrh in a healthy person does not pass into phthisis. But a more specific bronchitis may pass into a broncho-pneumonia, thus favoring entrance of bacilli and phthisis. Hence treat bronchitis, especially in children and delicate ones, with great care, ditto measles, whooping cough, etc. Pleurisy also appears to usher in phthisis, may be localized over apex, moderate but abiding fever, effusion moderate. The signs of phthisis manifest themselves from 1 to 2 months to year after this pleurisy. Occasionally there is pleurisy with great effusion. Laryngeal catarrh may also be the mode of invasion. Is a bad sign, usually do not do well. Laryngoscope shews pyriform swellings on arytenoid cartilages. But sometimes simple, mild laryngeal catarrh is a sign of impending phthisis. An anæmic state of larynx is common in phthisis. A common mode of invasion in the young is an enlargement of external lymphatic glands, as of neck. Scrofulous glands are tubercular. When they soften and break down then system is invaded. A statement that tuberculous disease of mesenteric glands is primary cause of tuberculous disease in children. Certain disease of bones, morbus cocci, caries of vertebræ, etc., are all tuberculous affections. In cases of hemoptysis, pleurisy, bronchitis, laryngitis, caries, etc., when they usher in phthisis, several explanations are offered, viz., that these diseases are evidences of tubercular disease already present. 2. These diseases may render part more liable locally to penetrability of the bacilli. 3. Or these diseases may only lower vitality, and thus lower resisting power of the individual.

PHYSICAL SIGNS OF PHTHISIS.—Vary with stage. 1, In early stage, suppose a few scattered nodules in apex; and 2, with several large masses. With first no signs would be detected, but you would get round note, but auscultation gives feeble respiration or else harsh. Sometimes the expiratory sound is unusually long and rough. Vocal resonance, expansion, etc., give no sign. But in second case there would not be full expansion. Perhaps also flattening and collapse and fibroid shrinking of lung. Percussion gives dull note, the degree varying to wooden dullness with amount of tubercular consolidation. Auscultation gives harsh breathing or blowing or tubular when consolidation is great. Vocal resonance is greater, also heart sounds. Wavy respirations may be noted, jerky cogwheel. This sign is valuable when in apex, especially if breathing is harsh, in addition. May be owing to partial consolidations and adhesions interfering with uniform expansion of the lung.

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SECOND STAGE OF SOFTENING.—As a rule there is only one new sign for this. The foregoing sounds may be present, but when you hear moist crackling it indicates softening. It may be fine as at beginning, getting larger, crackling, clicking,—with it probably the area of dullness, flatness and non-expansion are larger. Septic symptoms probably are now seen, chills, hectic fever, night sweats, emaciation, sputa will change, will shew bacilli, shreds of yellow elastic tissue and pus. Third stage of cavities:—Softening gradually enlarges, masses are spit up, leaving cavities, emaciation is now advancing rapidly as a rule, night sweats more frequent. Patient cannot lie indifferently, but lies on back or healthy side—larynx now also gets affected, also epiglottis—vomiting is also a symptom, reflex from the cough, or else from ulceration of stomach—mouth is apt to be raw and aphthous. Cough is now loose, mixed with blood—haemoptysis is common, may be fatal from a small pulmonary aneurism bursting, pulse weak. In long standing cases an alteration is seen in fingers and toes, the ends become bulbous and nails convex, indicating chronic disturbances between circulation and respiration, as in some cases of chronic aneurism, emphysema, valvular disease.

PHYSICAL SIGNS OF CAVITY.—Depend on size, position, state, etc. First a moderate sized cavity in apex surrounded by consolidation is one case, another is a cavity very near surface. A third might be deep seated, and fairly healthy tissue intervening. Where a cavity is near the surface there is a flattening with a deficiency of expansion in all cases of cavity. Percussion in the first case gives dullness, heavy strokes may give tubular dullness. Percussion in the second case may give amphoric sound. If several bronchial tubes open into it you will get the cracked pot sound when the patient's mouth is open. In the 3rd case you may get normal signs. Auscultation over No. 1 will give no sound if cavity is filled; but if half full of fluid, with bronchus opening into it above the fluid, you will get cavernous breathing. If cavity is larger, amphoric breathing may be noted, but is rare. You get it to perfection in pneumothorax. In a cavity half filled with fluid, if bronchus open below the level of the fluid you get bubbling; metallic tinkling is exceptional, for it takes a very large cavity. Same with metallic echo.

COMMON SYMPTOMS.—Diarrhœa may precede the local signs, but is never common during disease. Its peculiarity is its untreatable character, no pain, but when ulceration occurs in intestines or stomach pain is experienced and blood is found in the stools. Peyer's Patches may ulcerate without diarrhœa. An obstinate diarrhœa in a young person is suspicious of phthisis. Anæmia is always present, and lividity, fatty degeneration of the viscera, etc., shew failing nutrition. There is also common a local fatty degeneration of the liver which gets enlarged. Amyloid disease of the liver perhaps involving spleen is caused by suppuration in the lung. Fistula in ano may precede phthisis, but usually accompanies it, especially in later stages. It is apt to be chronic, acts as a safety valve and is favorable. Do not operate. The bacilli exist in these fistule. Best authorities

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are in favor of operating, but Dr. Howard is not. Intercurrent acute pneumonia, seldom very serious, not as serious as primary pneumonia unless in the late stages of phthisis, also local bronchitis accompanies phthisis. Pleurisy, either plastic or effusive, or perforative, setting up pyo-pneumothorax. This last is accompanied by shock, intense pain, and generally is rapidly fatal, but not always.

Ulceration of epiglottis is found in advanced stage, is very painful on swallowing. Chronic laryngitis is found in a bad stage generally. Tubercular meningitis in adults and tubercular peritonitis in advanced stages, which are fatal.

CAUSATION OF PHTHISIS.—It is an infective disease caused by a specific bacillus which can be classed in Zymotics. This bacillus is $\frac{1}{6000}$ ths. to $\frac{1}{15000}$ ths in length and $\frac{1}{4}$ as thick or $\frac{1}{4}$ to $\frac{1}{2}$ as long as a red blood cell. These bacilli are found in sputa in stage of softening, free in the cavities and ulcerated walls and in caseous and catarrhus tubercular pneumonia, but are few and far between. In miliary tubercle, but not plentiful, and in blood. These bacilli are found in all tuberculous diseases, as strumous synovitis, serofulous ostitis, in tuberculous disease of testicle, serofulous kidney, glands, suprarenal capsule, etc., in larynx, peritoneum and in urine when bladder is affected. They live upon the tissues, as parasites—not their worst effect. They also produce leucomains, organic poison is their worst effect. These secretions lower vitality of the cells, thus giving bacilli the advantage, and destruction ensues. If phthisis is due to micro-organisms in air, which when inhaled set up phthisis, why do not all have it? One reason is that the germs are only in the tidal air, and if bronchial membranes are healthy these bodies find no nidus. Another is, there must be a predisposition, so that only certain individuals of families are its victims. There is a predisposition to race (negro), family, or individual, and in recovery of each individual varying with the age, which in the adult predisposes to seat in lungs. The general or local predisposition is inherited or acquired. If there be no predisposition the entrance of the bacillus has no effect. The law of heredity is, modes of vital action become impaired, may be continued, and even become more manifested in the child, so size, shape, color of hair, digestion, passions, etc., may be inherited. So the predisposition, not the disease, is communicated to the child. A few cases are recorded where tubercle has been born with fœtus. In these cases it is supposed father had tubercle of testes, or mother of ovary. A recent view is, it only occurs from when placenta is tuberculous. The ratio of inheritance is from 25 to 48 per cent., or about 33 per cent. of cases, but people are as ignorant of family history that the story is incomplete, for this disease may skip a generation. The later children of tuberculous parents are more liable than earlier children. These are more likely to manifest tuberculosis at an earlier age than parents, lungs may not be affected, but meninges, peritoneum, etc. These children may even die before the parents from tuberculosis. If a son inherit phthisis from a mother he is more apt to have it earlier, and hæmoptysis is more apt to be a symptom (cross here-

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dity). Parents not tuberculous may transmit a predisposition to phthisis, in this way transmitting a tendency to catarrh of the bronchial tubes, to hæmoptysis, etc., thus leaving child with feeble resisting power; so children of feeble parents, consanguineous parents of the intemperate, diabetic, syphilitic, cancerous, etc., may be predisposed, having a small resisting power.

SEROFULA.—Modern view is serofula is phthisis, that tubercle bacilli are in serofulous glands; another view is that it constitutes a vulnerability, especially of glands and mucous membrane, to tubercular attack, so they have little resisting power—no special bodily type is given to the serofulous. Tubercle attacks all types of the bodily conformation, still certain conditions influence those with long, narrow chests, where chest capacity is small are predisposed. So also weak muscles, especially of respiratory muscles, for the respiratory act is less in such persons. Its intensity is less, hence not so readily getting rid of products of bronchial membranes. This mucus lodges more or less, and gives a nidus to bacilli. The respiration being weak, the bacilli are not dislodged. The foregoing is the reason why phthisis begins in apex, for there the respiration is the feeblest. In children acute phthisis occurs behind and in bases. Race—Negroes are most of all liable, then descendants of Spaniards, half-breeds thirdly, between Negro, Indian and Spaniard, then Europeans, recent immigrants, and duration longer, and lastly Indians of pure descent. Frequent intermarriages of small tribes must be a predisposing cause. Age—is most frequent between 25 to 35, for we reason there are more people of that age than those older. For taking *pro rata* for different ages, all ages are bound to have it nearly alike except children; in children phthisis is not common, but other tubercular affections are. Acquired predisposition—all causes which depress the vital powers, as overstudy, depression, passions, over-work, so also general debility from whatever cause, and all febrile affections. If these act in early life effect is great, insufficient food, air, overcrowding, also lower the vitality of the individual. Then there are phthisogenic diseases, as diabetes, 43 per cent. dying of phthisis, measles, whooping cough. Syphilis predispose, but typhoid and smallpox do not powerfully predispose. Inanition is a powerful predisposing cause, persistent anorexia also. Blood inanition, congenital malformation of the heart, as stenosis of the pulmonary valves, also predispose, but mere anaemia does not predispose. All diseases of respiratory organs especially predispose. Why? In some cases, the inflammatory materials form a suitable nidus for bacilli, in others deficient expansion of certain areas of lung, in others abraided surfaces offer entrances to the disease. Then these local diseases lower the resisting power of the whole individual. Climate, etc.—excessive bodily exercise may be a predisposing cause—low, damp, water-logged soils are said by some to be predisposing, disputed by others—then some say that exposure to damp, chill winds predisposes. Phthisis is rare in elevated regions, as in Colorado, Andes, Mexico, etc. The higher you go the purer the atmosphere. Climates characterized by great alterations of temperature, especially if damp, perhaps by causing catarrh, predispose. A steady cold or hot climate does not

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predispose, variable temperature does. Purity of the atmosphere, no foul air, germs, dust, etc., freedom from overcrowding are the points to be noted, so the disease is commoner in city than in country. Food influences,—vegetable food predisposes more than animal food, as 34 is to 36 is the ratio between herbivora and carnivora. Alcohol predisposes to phthisis. Flesh or milk from phthisical cattle, or milk from phthisical nurse perhaps is a fruitful source of phthisis. Only recently have bacilli been detected in the milk. The milk contains bacilli only when the udder is tubercular.

CONTAGIOUSNESS OF PHTHISIS.—The Italians have long believed in it, only lately have other nations believed this, it is important. Phthisis cannot be highly communicable, for at Brompton Hospital for Consumption only one servant in 21 years died of phthisis. Other similar reports come from other special hospitals. It is admitted there are exceptional cases, for proof of sleeping with a consumptive and taking the disease are well known, so if it is contagious man and wife should both be affected; but this rarely occurs. Evidence shews that relations need to be intimate to effect contagion, as sleeping together in badly ventilated rooms. Tubercular congress affirmed it to be contagious, that it is communicable to flesh and milk of bovines. Said meat and milk should be inspected, tuberculous cows destroyed, boiling milk, cooking meat well destroys the bacillus. The goat is not a subject of phthisis, hence its milk is purer. It has been proved that phthisis has been communicated by milk and flesh to animals, but there is as yet no such proof in man.

FIBROSIS OF LUNG.—Fibroid phthisis, cirrhosis of the lung is generally of tubercular origin, is one way of arresting phthisis. This fibroid change sometimes follows broncho-pneumonia, as interstitial pneumonia; sometimes also follows ordinary bronchitis and capillary bronchitis. Acute primary bronchitis rarely ends in fibrosis; fibrosis also occurs after pleurisy, setting up interstitial pneumonia,—rare. Inhalation of dust, mineral, vegetable, as collier's lung, sets up fibrosis. It is not settled whether there is an idiopathic form or not. Appearance of fibroid lung:—the structure is tough and firm, reduced in bulk and of a dark color—opaque strands of fibrous tissue ramify through—the bronchial tubes are dilated except the smaller ones, and these may be obliterated. The induration is not uniform. The organ is usually pigmented from chronic congestion. The pleura is also much thickened, even $\frac{1}{2}$ inch. In cases of tubercular origin you will find cavities, etc., at the apex; if from dust, the fibroid change will be bilateral; if from pneumonia it will probably be at bases.

DIFFERENTIAL DIAGNOSIS of phthisical from inflammatory fibrosis. Phthisical affects apex of lungs; simple fibrosis affects one lung generally, not apex, nor will there be the other symptoms of phthisis, as hectic symptoms, sweating, diarrhoea, etc. Hæmoptysis is more frequent in tubercular form. The deformity to chest is greater in simple fibrosis than in tubercular. Signs of cavity occur early in phthisis. Phthisical form is common and of short duration, while simple form is rare and of long duration. Phthisical form is inherited perhaps. In

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cases of doubt when, say, only one apex is affected, or apex and base is phthisis, the presence of tubercular bacilli is the only true test.

TREATMENT OF PHTHISIS.—It is at present treated hopefully—early or preventive treatment. Promote healthy blood changes by daily exercise in open air, but do not overdo the exercise, do not produce over-fatigue; horseback riding, walking, cricket are good, but not football, lacrosse, etc. Exercise is not allowable after phthisis has begun. Promote full play of chest, exercise does this, but practise full expansion of chest at an open window, so that even the ultimate cells will be ventilated; use dumb bell exercise, health lifts, parallel bars, etc., but do it only in moderation. Singing, reading aloud is good; occupation needs to be chosen; sedentary indoor exercise is not advisable, adopt outdoor work, as farming, ranching, etc. Also try to restore and maintain nutrition by proper food, such as milk; meat should be plentiful, also fat; the milk may need to be peptonized; if there be no appetite an oesophageal tube is passed, and peptonized food introduced. Invigorate and harden the system, so as not to be susceptible to changes, so use cold water and cold sponging, the douche, cold bathing, etc. Promote the appetite by tonics; do not begin them if the patient is feverish or dyspeptic, but first examine the tongue, etc. Give blue pill, Pot. Cit. gr. 5 to 10 in some vegetable bitter, as Gentian, to remove catarrh of the stomach, then begin tonic treatment with mineral acids, especially if the skin is active, tongue clean and urine clear—give with vegetable bitters, Calumb. Quassia and Gentian. If urine is loaded, tongue coated, give alkalies and vegetable bitters, then begin Cod Liver Oil—let dose be small at first—dr. 1, best give after a meal—addition of a few minims of Sulphuric Ether will obviate nausea. Casswell's Emulsion of Oil, Pepsine and Quinine is best for those who cannot take clear oil. If glands are affected, Liq. Chlorid. Calcii given with the oil is good. Quinine is best for tonics—nervine—dose may not exceed 1 gr., give T.I.D. with a min. acid before meals. Meat extract is diastase, is used if oil cannot be taken or starchy food not digested; give before meals. Hoff's Ext. of Malt is good, contains also bitters of hops; give wine-glass full. Iron is also good if there is no fever or no hæmoptysis. Arsenic in m. 2 to 3 of Liq. Fowler T.I.D. is good where there is anæmia, nervous prostration or tissue waste. Change of air and travel is a good tonic; in first stage a long sea voyage is very good, perhaps the best. A change of climate is the best of tonics. Protect against cold, over-fatigue, catarrh, bronchitis, etc., anything which will lower the vitality, as typhoid, whooping cough, measles, etc. 2nd stage,—confirmed phthisis. Physical signs locate the disease, the disease is active, fever, $r > 100$, high, perhaps night sweating. Put to bed and treat like pneumonia, apply poultices or turp. stupes to chest, counter-irritation is very valuable, and give to reduce fever gr. 10 Cit. Pot., Acetum dr. 1 every 2 hours, keep in bed till temperature returns to 100. In another case the signs are not so bad, no high fever or high pulse. You cannot put this one to bed, he is not sick enough, so first ascertain the state of digestive organs. Here is

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the key to phthisis,—tongue red with white fur, no appetite, thirst, so fight this. Give Am. Carb. gr. 10, Bis. Sub. Nit. for gastric catarrh. To restore appetite give Sod. Carb. and Gentian for several weeks. If nausea is present then Liq. Strychnia m. 3 to 4 is best agent for phthisical nausea. Diet needs careful watching. Then in both cases, after fever is reduced in one and the stomach restored in other, start building up treatment. Climate change, Cod Liver Oil, tonics, etc., are in order. Re exercise,—in this stage do not overwork the lung, as it is diseased, still a certain amount of exercise (not violent) is needed. 3rd stage—softening. Septic fever is a symptom, due to absorption of purulent matter. So for hectic fever give Sod. Salicylate gr. 30 1st day, 20 2nd day, 10 3rd day. Stop for 3 days and see if fever is reduced; if not, do it over again for 3 days, etc. It is well to combine a spirit with each dose, as ss. brandy or rum, or it may be given in smaller doses T.I.D., as in rheumatism, every day as long as fever lasts. Antipyrine or Antifebrine gr. 3 T.I.D. is good, give in little Aq. Menth. Pip., Quinine gr. 20 to 30, H. Br. once per day. Give these antipyretics a few hours before the recurrence of fever. In this stage there is great prostration, and alcohol is indicated for this, rye in this country. If the alcohol improves appetite, etc., it is doing good, but do not feed them on alcohol. In this stage all kinds of nourishing food are called for, tonics, oil, etc. Creosote is attracting attention, some think it a specific. Dr. Howard has not tried it; it is said to have best effects in slowly progressing chronic cases, with not much fever, but some say it can be used in any case. It is hard to prescribe; here are 2 formulas: R. Beechwood Creosote m. 15, Tr. Gentian m. 40, S.V.R. dr. 6, Sherry ad oz. 4, Sig. oz. ss. T.I.D. R. Creosote m. 3, Glycerine dr. 1, Brandy dr. 3, Ess. Peppermint Q. S. Sig. T. I. D. in 24 hours. Be sure and get Beechwood Creosote, other forms are not good, impure.

INHALATION TREATMENT.—Dr. Howard's experience is that these inhalations are valuable to allay cough, check expectoration, and often check the sweating, cannot do any more. They do not act as germicides, for these bacilli can remain 15 minutes in a watery solution of Carbolic Acid. And again these vapors do not penetrate to the air cells, even Iodine, Turpentine were the only agents which reached the air cells, so inhalation as treatment of phthisis is a failure. They are valuable for catarrhal states attending phthisis, equal parts of Creosote and S. V. R. is good inhalation. Terebine m. 10 on inhaler is also good. Following is good: Iodoform 1 part, Turpentine 20 parts, put a few drops on sponge of inhaler and use every hour, from 5 minutes to 30 minutes each hour. The inhalation of the fumes of Sulphur is very valuable. Burn in a closed room 5 drs. of Sulphur to every cub. metre of air. After burning 12 hours let patient go in and stay in room 8 hours. This is a new method. Injections of H₂S. and Carbolic Acid into rectum have fallen into disuse. Sulphur springs will benefit where there is bronchial catarrh.

INCIDENTAL SYMPTOMS OF PHTHISIS.—Cough causes are numerous, do not resort to opiates. Cough may be due to bronchitis, treat as such. If that only

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needed to bring up sputa, promote it by hot tea or coffee or hot punch; if from laryngeal catarrh, etc., treat as such. The ordinary cough of phthisis needs treatment, is caused by irritation of disease in lung. Counter-irritation is good, also sedatives; do not use Opium, use H. C. N. Chloroform, Hemp, Codeia. You may have to fall back on Opium, but it interferes with digestion. An inhalation may help the cough, add Camphor or Chloroform to the inhalations, it benefits. Night sweating (is exhausting). 1. Improve general strength, as cup of beef tea at bedtime, etc. The best anti-diaphoretic is Liq. Atropia, sometimes Pulv. Ipec. Co. does so. Acid Sulphur Arom. T. I. D. will sometimes check. Piero. Toxin. gr. $\frac{1}{16}$ will often work, or Strychnia. Washing chest at night and morning with vinegar 1 part, water 2 parts, is good.

HÆMORRHOEPTYSIS.—Ordinary slight hæmoptysis does not call for treatment, you cannot do much for it. Rest in bed and no talking, plenty of ice to eat is good. If urgent, put large bladder of ice over the point of hemorrhage. Internal remedies: First, hypodermic of Ergotin gr. 5 to 8, repeated every 4 hours, Lead gr. 3 to 4, and Opium gr. $\frac{1}{4}$ to $\frac{1}{2}$, and Gallic Acid gr. 10 to 20, is a good combination. In extreme case put a ligature around thigh, not very tight, to lead to accumulation of venous blood there, lowers general circulation. Do not let patient get up too soon, as it is apt to recur.

CLIMATIC TREATMENT.—Change of climate is most hopeful in early stages, also in later stages during quiescence of disease, also if local changes are limited and constitutional disturbances are arrested. In cases of chronic phthisis they are especially adapted, also if there be no important complication as of larynx or bowel. Never send patient away if disease is active. Qualities of climate desired: 1. Purity of air, as freedom from gases, dust and germs. 2. Dryness of air, if pure. 3. Absence of wind, especially if cold and damp. 4. Uniform climate, no changes, plenty of light and ozone, which do not favor bacteria. 5. As a rule a low temperature in summer. At present high altitudes are favored. Effects of last are: First, increase at first in number of respirations of pulse, returning to normal after a time. Heart becomes stronger, chest expands 1 to 3 inches. All functions of body are stimulated. Certain diseases are unsuitable to high altitude, as all structural diseases except pulmonary, and even some of them, especially diseases of heart and vessels, Bright's, diabetes, diseases of nervous system, irritability, headaches, etc., but mental disorders of overwork are benefited if insomnia is a complication. Also emphysema and phthisis with emphysema, or where lung is reduced in capacity by disease, as cavities, etc. Cavity cases and hæmoptysis are not suited. Phthisis of advanced age is not suited, nor if attended by great debility. Cases suitable are (for high altitude): inherited predisposition, disease in early stage; hemorrhagic cases only in first stage; if thoracic cavity be poorly developed; in case of unresolved chronic pneumonia; all chronic form of tubercular phthisis if area of lung damaged be not too large; if there be little pyrexia in chronic case; unresolved pleurisy is often benefited.

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HIGH ALTITUDES.—Europe, St. Maurice, 6000 ft. ; Dansflets, 5000 ft. ; America, Colorado, Banff ; intermediate elevations as at Ashville, N. Carolina Walden's Ridge, E. Tennessee ; also the Adirondacks. The same class who are benefited by altitudes are also benefited by dry, mild climates. In Europe the Riviera, Algiers in Africa ; Madeira is mild and moist. Inactive chronic cases are suited to Algiers, Madeira, etc. ; Southern California and Florida are too relaxing, too moist. Tell them in California to get back from coast 50 to 60 miles, and avoid fogs. A long sea voyage suits same class of cases as high altitudes. Send in autumn after the equinox. But have patients willing to go and no objection to sea, and then let them have best of accommodation. A sailing vessel is best, but accommodation must be good.

PROPHYLAXIS.—Let no one sleep with a phthisical patient. Let sputa be received into sublimate solution, pour boiling water on it before emptying.

ACUTE PHTHISIS.—Acute inflammatory phthisis or caseating pneumonia occurs in two forms : in one the lung is stuffed more or less with agglomerating tubercle, in another a large patch of caseating tubercle infiltrates lung. In many of these cases the intervening lung will be congested or hepatized, or even normal. Usually all other organs of body are also tuberculous at the same time. Spleen swollen, bronchial glands enlarged. Often miliary tubercles are seen. Symptoms are often like simple pneumonia, for it sets in suddenly, but temperature is less high, respirations not so short or shallow. The disease may involve both or one, or only a patch of one lung. After 14 to 20 days you get signs of phthisis, the softening proving it phthisis, not pneumonia. Death may ensue before this stage. Repeated and copious hæmoptysis are not uncommon.

PHYSICAL SIGNS are those of isolated patches of consolidation, so suspect patchy pneumonia ; these signs beginning perhaps in base or centre ; the early supervention of signs of softening. The physical signs persist, do not clear up like pneumonia.

COURSE (several).—1. May prove fatal in 15 to 60 days—common. 2. May be protracted, 3 to 6 months, galloping consumption. 3. May sometimes pass into chronic form. 4. Lastly may recover temporarily. Now and then this inflammatory phthisis sets in quietly, not like pneumonia ; may be little fever ; but such persons are very weak, pain in side, cough and moderate elevation of temperature at night. Physical signs are of mild pneumonia. It may be either acute or chronic.

TREATMENT OF ACUTE PHTHISIS.—Treat as pneumonia. Stimulants—antipyretics and counter-irritants. Diet of milk, animal broths, meat jelly, also along with it claret. If patient cannot take milk, add to quantity claret. Antipyretics, Quinine gr. 30, or Antipyrine. Alcohol oz. per day is employed throughout the case, give a little every 2 hours. If there be much cardiac failure give Digitalis ; give frequently. To relieve congestion of lung use large fly blisters over chest, 3 hours—repeat in 3 days. Treat as above all through the acute stage.

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ACUTE MILIARY PHTHISIS.—Acute general tuberculosis, infective phthisis, embolic phthisis. This occurs anatomically in 2 forms: 1. When lung from apex to base of both lungs is stuffed full of miliary tubercles, intervening tissue normal or congested. In these cases all other parts of body are affected. 2. In other form localized patches are similarly stuffed with miliary tubercles.

ORIGIN.—The tuberculous material enters small lymphatic vessels or thoracic duct, thence into the blood, or more often the tuberculous matter enters veins, hence embolism. Tubercles existing in any part of the body may thus spread, as tubercles of glands of the neck, of joints, testes, etc. It is sometimes a result of chronic phthisis, but it is very exceptional for this to occur. This form sometimes supervenes after measles, typhoid, broncho-pneumonia.

SYMPTOMS.—Depend on organs specially attacked, but in this case we are dealing with lung. It may appear patient has been quite well, or perhaps has just suffered from measles, etc., or may have been suffering from chronic phthisis, but sometimes it comes on without previous disease. The disease begins with a rigor, temperature 103 to 106, rapid, weak pulse, 120—early disturbance of stomach, vomiting, loss of appetite, constipation, early loss of strength, urine febrile, perspirations free, sometimes even are harsh; cough is not a constant symptom, but may come on late, and is attended with a little clear viscid expectoration, becoming more or less opaque, and may become stained with blood,—puzzling. Hæmoptysis generally absent. An early symptom is an excessive dyspnoea, some delirium, sleeplessness, coldness of extremities, wandering or active delirium, and patient dies asphyxiated. Morning temperature low, evening temperature high throughout.

PHYSICAL SIGNS.—May be those of general bronchitis. In other cases sometimes you think you get dullness at a spot, and there the respiration is slightly feeble, spots will not be symmetrical. In a few days you will get rough, harsh breathing at this spot, not blowing breathing. Duration of this form varies 2 to 3 weeks, more commonly 4 to 5 weeks. The rapid cases are apt to be complicated with cerebral symptoms which resemble typhoid; the prolonged ones resemble bronchitis. Bacilli are not present in the sputa, nor no softening. Prognosis is very bad.

TREATMENT is hopeless, still treat like typhoid fever; support the strength, lower the temperature by antipyretics, spongings, etc., counter-irritation for chest. Alcohol is used throughout.

XXIV. DISEASES OF THE NERVOUS SYSTEM.

1. Diseases of the brain. It is covered with three membranes. Cerebral meningitis is inflammation of these membranes. The arachnoid may be considered a part of the pia mater, as inflammation of these always go together, but that of the dura mater is separate. Pachy meningitis is inflammation of dura mater; lepto meningitis of the pia mater or arachnoid.

LEPTO MENINGITIS.—Two forms: 1, tubercular; 2, simple, or non-tubercular, or purulent and simple.

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SYMPTOMS OF SIMPLE FORM.—Are divided into extrinsic and intrinsic, the latter being mainly functional. This lepto meningitis may be ushered in with premonitory symptoms, as of cerebral excitement, wakefulness, restlessness, irritability, headache, but usually comes on quickly. The developed symptoms are divided into three: 1, stage of excitement; 2, stage of transition; 3, stage of coma or exhaustion. Symptoms of 1st are pain in the head, heat of the scalp, flushing of the face, vomiting early, persistent, obstinate, unaccompanied by nausea, marked constipation, also a coated tongue with rapid regular pulse. The intrinsic symptoms indicate brain excitement, irritability of temper, delirium even furious, rarely calm. The sensory signs are intolerance of light, pupils contracted, motor excitement by twitchings of the face and eyelids; restlessness. This stage of excitement lasts from 1 to 3 days, passing into the second stage—that of transition. Temperature is high. Symptoms of second stage:—febrile symptoms subside, respiration irregular, perhaps sighing, pulse less frequent and less regular, vomiting and constipation usually remain, urine often retained, mental phenomena (intrinsic) subside, delirium quieter, may even cease, can tolerate light better, pupils sluggish, person more stupid, headache continuing would indicate inflammation, but usually subsides, motor excitement, increased twitching, squinting, spasms of the limbs, signs of incipient paralysis. This transition stage lasts from 1 to 3 days, but may be absent, and first stage passes into the third stage of coma or depression. Now the surface is pale and cool, pulse frequent, respirations irregular, perhaps stertorous or Cheyne-Stokes breathing, contraction of abdomen and retention of urine are observed, yet sometimes relaxation of the sphincter allows the urine to dribble, sordes collect on the teeth, constipation may cease, person cannot be aroused, is unconscious, pinching has no effect, pupils large and inactive, motor signs may shew paralysis of one or more areas changing. In this advanced stage with nerves paralyzed and death nearing, the temperature goes up high 104 to 108. Sometimes the first symptom may be stupor or coma, or severe headache, or sudden delirium or spasm, or even the loss of speech. Sometimes the disease is quite latent, looks like malingering; patient taciturn. If meningitis is secondary to some other disease, the pain and vomiting are often absent, but the irregular pulse and respirations will be noted, countenance will be of marked pallor, and you will get some of the intrinsic symptoms, as intolerance of light, etc., but in later stages the signs will be positive enough.

There are three cardinal symptoms of meningitis—pain in the head, vomiting and constipation.

COURSE OF THE DISEASE.—It is unfavorable, lasts 8 to 9 days, may prove fatal in 24 to 36 hours, exceptionally lasts a few weeks.

PROGNOSIS.—Often recovered from in early stages, but is a grave disease with a high mortality.

PACHY MENINGITIS is divided into external and internal forms, the latter of which is very rare, but the external form is very common. External pachy men-

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ingitis is common, due to injuries to head, or caries or necrosis of the cranial bones or to inflammation of the middle ear, or to chronic disease of the petrous portion of the temporal bone, so these latter medical forms are obscure. The symptoms are nearly the same as lepto meningitis, but have a few distinguishing points. At outset it may be obscure and latent, oftener not. It is more gradual in its onset than lepto meningitis, more localization of the pain in the head. If paralysis ensues later on from abscess it will be on the opposite of the body than the pain in the head. Owing to the existence of sinuses these often become inflamed, thrombosed, hence tenderness along the jugular, or even a rope-like induration. If in the lateral sinus, the plugging may extend to the external auricular veins, hence œdema of the ear. If in the cavernous sinus, the plugging meets nerves supplying the eyeballs, hence paralysis with squinting, may even affect both, it may also cause prominence of the eyeball and œdema of the lid. Optic neuritis never occurs in simple meningitis, but in inflammation of the ear, the inflammation extending along meninges to the optic nerve sets up optic neuritis, and lastly on account of these sinuses septicæmia is often set up, producing rigors, intermissions in fever, etc., being symptoms of pyæmia. Internal pachy meningitis is divided into two forms, may be simple like foregoing, or the hemorrhagic form, as in old broken down people, called also hæmatoma of pia mater.

MORBID ANATOMY.—Inflammation of the dura mater, it becomes redder and softer in early stages, and loosened from its attachment to the bone; pus may accumulate between it and the bone, and sloughing sometimes occurs. If it be due to an injury, you will find the inflammation at the site of the injury with extravasation of blood between the bone and the membrane. The inflammation, even if unilateral to begin with, may extend bilaterally. In lepto meningitis the sac of the arachnoid may contain fluid, but chief changes are in the pia mater. It becomes congested and is more easily separated. It has one of three effusions: 1, a milky gelatinous serum; 2, a coagulated lymph; 3, greenish pus. On slitting up the longitudinal sinus you may find puffs and coagula. The pia mater is found to strip easily from the cortex, which is often redder than normal, and softer, so the disease was meningo cerebritis. On section of the brain the ventricles are found not softened, are empty sometimes, but may contain by extension of inflammation serum or lymph. You do not have a large collection of water, as in a tubercular form. The microscope shews an infiltration of leucocytes along the course of the vessels.

CAUSES OF MENINGITIS.—It is most common during active period of life, and more frequent in men than in women. It is common also in young people, occasionally even under 10 years. External violence, intemperance, mental excitement, extension of disease from bones of head and from the ears, hemorrhages, abscesses, sunstroke, constitutional sickness. It occurs occasionally in other diseases, as rheumatism, Bright's Disease, croupous pneumonia, smallpox, erysipelas of the scalp, suppression of the menses, or of bleeding piles or healing up of a chronic eczema of the scalp. Sometimes the softening of a thrombus or suppuration of

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the eyeball may lead to it; lastly, it may follow a pyæmia, suppurative stage of pneumonia, pulmonary abscess, empyema, necrotic endocarditis, etc. Sometimes no apparent cause can be found, and then you have the idiopathic form. Several diseases may need differential diagnosis, such as rheumatic delirium, delirium tremens, acute mania, tubercular meningitis. Rheumatic delirium occurs in course of rheumatic fever, meningitis is a curiosity in rheumatism. It is generally accompanying visceral rheumatism at 8th to 12th day. The articular affection may disappear when delirium sets in, headache and vomiting are absent, nor does the pulse shew same alterations. The pulse in the later stage is weaker and more rapid, before or along with delirium there is hyperpyrexia in rheumatism. Delirium tremens is not often puzzling, but active form may be. The history is of intemperance. There is not much febrile disturbance, tongue loaded, secretions foul, usually no headache. Again there is marked tremor, the skin is moist, patient sleepless, and delirium is peculiar, is active with frightful hallucinations, with a sense of dread; generally the delirium is inoffensive, and a firm voice will control the patient. Acute mania may be puzzling. You recognize it from meningitis by absence of fever, heat of the scalp, vomiting and pain in the head, also absence of the three stages of meningitis; in mania the excitement keeps up for a long period, the delirium is active, talkative.

TREATMENT OF SIMPLE MENINGITIS.—It is desirable to lessen or check the inflammation in the brain, so blood-letting has been practised; this is not now used, local blood-letting is resorted to instead. Gowers says blood-letting is only to be done after a sunstroke, after excessive mental exertion, after traumatism, or in idiopathic cases. Apply leeches behind the ear or over the temples, or over parietal foramina. Germans apply leeches to the nose. Always have the patient's head and shoulders raised to lessen the blood supply to the head, and apply cold by the ice bag or by the water coil; let it be the duty of one to keep cold applied, as it is important; cold to head, then keep heat to feet by water bottles, etc.

INTERNAL TREATMENT.—All give a good cathartic, Calomel gr. 10, Podoph gr. 2 to start with, followed by a saline. For constitutional treatment, give mercury,unctions is the best way to give, rub in in the groin or axilla every 4 hours, do not salivate, just keep gums tender; others recommend Pot. Iod. gr. 10 to 15, Pot. Brom. gr. 20, and Chloral gr. 2. The Iodid. for a specific action, the other two for sleeplessness. Give the above every 4 hours. Some would add Ergot to the above to lessen congestion, so add Fld. Ext. Ergot m. 10 to 15 to the above dose. Instead of blood-letting, Aconite may be used 2 to 3 gr. every 2 to 3 hours, and watch the action. All the above is for the first or active stage. In the second stage drop blood-letting, Bromides, Mercury, Aconite, etc., but Iodine may yet be given. Blisters are now used, beginning down between the shoulders and working up the occiput. In the third stage give stimulants,—strong broths, wine, whiskey, etc. In septicæmic form, Iron and Quinine in full doses are best, examine the ear for pus, also mastoid process. If you suspect abscess of the brain, trephine and put in a drainage tube.

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TUBERCULAR MENINGITIS.—Basilar form, acute water on the brain. This disease is always secondary to tubercle in some other organ, or even in the brain itself. Cases do occur where no such disease can be found elsewhere, and would then become a primary meningitis. This tubercular meningitis is usually secondary to pulmonary tuberculosis, to tubercular pleurisy, or of the glands, bronchial or mesenteric, or of those of the neck, or from tubercular disease of the genito-urinary organs, bones, etc., or it may be part of a general tuberculosis in infants, and sometimes it may arise from a solitary tubercular mass of the brain.

SYMPTOMS.—Usually has premonitory symptoms, impaired health, etc. History—has been failing, getting thinner, thermometer shews a slight evening rise of temperature; child presents recurring febrile attacks, especially in the evening, used to be called infantile remittent fever; temperature and mind altered, is cross, irritable or sluggish, or has giddy attacks, headache after exertion,—these may be attended by vomiting, not referred to the stomach; sometimes a cough, sometimes a dragging of one leg; symptoms come on gradually, but occasionally all signs are absent. Once the disease sets in, there are the same three stages as in the simple form with many of the same points in common.

DIAGNOSIS BETWEEN SIMPLE AND TUBERCULAR MENINGITIS.

TUBERCULAR MENINGITIS.	SIMPLE MENINGITIS.
Usually has premonitory symptoms.	No premonitory symptoms.
Often a family history of tubercle.	No failing of health.
Invasion slow and insidious.	Invasion violent, prompt.
Delirium develops more slowly.	Delirium develops rapidly.
Headache not so severe.	Headache severe.
Excitement less acute.	Excitement more acute.
Convulsions not so marked.	Convulsions may be frightful at outset.
There are remissions in progress.	Progress is continued and short.
Duration 12 days as an average, sometimes 2 to 3 weeks.	Duration 7 to 9 days, may be fatal in 1 to 2 days.
Temperature does not average as high as remissions; at close temperature may be high or low.	Temperature continuously high, no remissions, high at close.
Eye—apt to have optic neuritis. Sometimes tubercles can be seen in fundus of eye.	Eye—not apt to have optic neuritis.

A valuable symptom of meningitis is this: if you draw finger nail across cheek, a wide red mark will remain for some time, is a sign of acute disease of brain "tache cerebrale." Tubercular meningitis occasionally involves the vertex.

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Then tubercles would act in motor and intellectual centres, hence greater delirium and convulsions and tremors in the intervals; will also be caused by irritation of tubercles on motor area, hence thumbs drawn in. Pulse is apt to be frequent, absence of optic neuritis. These cases on the vertex are more liable to be violent, and run a rapid course.

PATHOLOGY.—The tubercle is of embolic origin, becoming arrested in small veins, setting up a local inflammatory process in sheaths of pia mater, which spreads to surrounding connective tissue. These tubercles excite a diffuse inflammation of pia mater, and disease extends to brain cortex. The tubercles at first are small grey translucent bodies, gradually become opaque to yellow, caseate, and soften rapidly. Sometimes grow into large isolated masses.

MORBID ANATOMY.—If you examine pia mater you will find minute tubercles, found chiefly in base in fissure of Sylvius; also in sides and convexity, less often. Are also found in velum interpositum; floor of ventricle, even on dura mater, even on substance of cortex. Sometimes membranes are red, congested, rare. In later stage fluid in ventricles by pressure lessens blood supply, and brain is anæmic. In addition frequently there is an opaque, milky, gelatinous exudation with patches of yellow (lymph) scattered through, found chiefly at base, also in base a thicker exudation leading to name of basilar meningitis. On tearing off pia mater, cortex may be softened in patches from a cerebritis, little ecchymosis, perhaps tubercles. In cases where you have the basilar exudation (thick), tubercles may escape observation unless you are careful. Dissect up the vessels and look for them. Make a section of brain. It is oedematous, ventricles distended with fluid 2, 3 to 6 oz. producing anæmia; this fluid may be like serum, needs care in removing. Sometimes it is opaque, containing flocculi—rarely it is purulent. Examine floors of ventricles, substance is softened. This fluid is usually of inflammatory origin, rarely from obliteration of canal between 4th ventricle and subarachnoid space and accumulation of natural secretion. The brain is generally symmetrically attacked, but rarely is localized. Sometimes growths of tubercle like a tumor are found in pia mater and adjacent structure, is very rare. Another peculiarity is a general eruption of miliary in meningitis, but perhaps without any fluid in ventricles. This inflammation of pia mater may extend above nerves, causing neuritis. Generally tubercles are found in other organs.

DIFFERENTIAL DIAGNOSIS.—1. Typhoid fever in children. But in typhoid vomiting is often absent, bowels may be loose, bowels become distended (in meningitis contracted), tenderness on pressure, iliac gurgling. Also typhoid temperature is typical. We do not see in typhoid the same vascular changes, for in typhoid pulse is quick all through. While typhoid symptoms point to bowels, the meningitis points to head; delirium early. In typhoid, with delirium headache ceases, not as in meningitis. Typhoid spots present. 2. Acute pneumonia—careful examination will tell, vomiting not so striking, but febrile symptoms are higher, earlier. Careful examination of lungs, crepitation and dullness will clear it up. 3. Spurious hydrocephalus or hydrocephaloid. History—first, this form

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depends on anæmia of brain and depends on recent weakening, as pneumonia, diarrhœa, weaning, etc. Its symptoms are : cheeks cold and pale, surface generally cold, especially face and extremities. Temperature may be subnormal. Fontanelles may be suppressed (should be depressed). Child lies in stupor, pupils dilated, making it puzzling, further breathing is irregular, and sighing, child dies comatose. Brain will then be found anæmic. Treatment would be—stimulants, good nourishing food, warmth.

OMITTED.—A symptom of both simple and tuberculous meningitis—you may have rigidity of neck like cerebro-spinal fever. Rheumatic affection of neck also may give this stiff neck. 4. Intraeranian tumors also resemble in certain symptoms a meningitis. 5. The eruptive fevers also frequently set in by convulsions. Scarlet fever has eruption in second day, smallpox in fourth day, and the brain symptoms disappear on appearance of the eruption. 6. Hemorrhages of arachnoid. 7. Thrombosis of a sinus. 8. Essential or idiopathic acute hydrocephalus. These three are rare, but their symptoms might resemble those of meningitis.

PROGNOSIS OF TUBERCULAR MENINGITIS is very bad, Dr. Howard never knew of a recovery, but a few cases of recovery are on record.

TREATMENT.—If active form in a healthy patient, then treat it as simple meningitis. Shave head, raise shoulders, give purgatives, use Calomel, use Pot. Iodid., apply ice bags, etc. Of attack in a scrofulous weak subject treat carefully, cold to head, shoulders elevated, an occasional purgative, Pot. Iodid. and food throughout. Of attack in an emaciated subject, the less you do the better. Wine, Iron, Cod Liver Oil are the remedies. Opium is not as contra-indicated as once thought. Chloral, Bromides are needed to allay restlessness and give sleep. Inject Morphia. A German rubs in Iodoform in Vaseline into shaven scalp, claims to have cured.

XXV. CEREBRITIS OR ENCEPHALITIS.

Acute inflammation of substance of brain without meningitis is rare, is then never general. This partial form may be diffuse or in patches. 1. The ordinary form is called purulent cerebritis, ends in brain abscess. 2. Another form occurs in children under six; acute encephalitis occurs after fevers, etc. It is interesting, leads to brain paralysis. Besides acute forms there are three chronic: 1. Chronic meningo encephalitis is the disease of the insane, paralytics. 2. Multiple cerebral sclerosis. Patches form in brain, also in cord. 3. Diffuse sclerosis of a whole or part of brain.

CAUSES OF LOCAL CEREBRITIS OR PURULENT CEREBRITIS.—Acute suppurating inflammation of brain or local cerebritis. Disease of ear is most common cause, or of mastoid cells, or of petrous portion of temporal bone. When earies of middle ear causes cerebral abscess it is in splenoidal lobe; if from mastoid cells, will be in cerebellum. 2. Often arises from suppuration in neighborhood, as of bones of nose, orbit, parietal, etc. This disease may be syphilitic or tuberculous. 3. Or causes may be traumatic, even from contusions or simple contusions.

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sion of brain, for you may have capillary apoplexies. 4. Irritation of tumors, aneurisms or hemorrhagic clot. So local irritation may cause it. 5. Pyæmia one of most common causes.

SYMPTOMS OF LOCAL CEREBRITIS or suppuration in brain, are not uniform. It is impossible to be definite about diffuse form. It cannot be diagnosed, but is apt to occur after slight wounds to head or chronic suppuration of ear. The diffuse form may have indefinite slow beginning, special symptoms developing after, or in some cases the invasion may be as sudden as apoplexy, or it may set in with violent convulsions, as after violent injuries and in pyæmia. Symptoms increase to death in 2 weeks.

GENERAL SYMPTOMS OF LOCAL CEREBRITIS.—1 Extrinsic,—are mild, little constitutional disturbance, temperature not high, pulse not excited, no great heat of scalp, constipation is generally present. 2. Intrinsic,—are decided, occur early, but the stage or excitement as in meningitis is not well marked; still symptoms interfering with function come on early and are well marked. Thus delirium is early, loss of memory, or mental confusion, anæsthesia, paresis in varying degrees, and in last stage all functions seem abolished.

COURSE OF ABSCESS.—A cerebral abscess may remain latent for months, giving no symptoms. Towards the end the symptoms are apt to be sudden, as when abscess points against the membranes, then convulsions; or into ventricles, then coma. In fractures the pus sometimes discharges externally, the termination then of the disease is apt to be sudden and violent.

DIAGNOSIS.—1. We assume it is an abscess when any of the causes mentioned are present. 2. When patient has a severe and fixed pain in head. This pain, although constant, is paroxysmal, and often may have preceded other symptoms for months. 3. When local lesions are noted by convulsions recurring always in same area, and unattended by loss of consciousness (hence not epilepsy). 4. Numbness referred to a certain fixed part, generally same part affected by convulsions. 5. Paralysis ensuing in same part. 6. Perhaps aphasia, or word deafness, or blindness. 7. Then following may be drowsiness, coma, etc. If we add to above fever, rigors and vomiting, the proof of abscess is complete. Should patient die in 3 to 5 weeks, we might not find an abscess, but a local area of cerebritis. Additional local symptoms,—impaired vision and optic neuritis; these are oftener absent than in tumor in brain. Cerebral nerves are not often affected. A group of symptoms of any local cerebritis is a febrile paralysis attended by variableness in degree.

TREATMENT.—Traumatic belong to surgery; if medical, then if ear be the same source, secure an early evacuation of the pus, as trepanning mastoid process. If due to pyæmia, evacuate; use Iron and Quinine, fresh air and stimulants for constitutional treatment. Medical treatment is as for meningitis, viz., raised head, cold to head, heat to feet, leeching, Pot. Iod. and Ergot, Calomel, etc. Recently quite a number of successful cases of draining cerebral abscess have been done. Localization of function localizes the abscess.

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XXVI. INFANTILE CEREBRO PARALYSIS.

CALLED ACUTE ENCEPHALITIS OF INFANTS.

SYMPTOMS.—Sets in suddenly, especially common in children under 4 years. Prodromita may have been absent, or it may follow some specific fever. Invasion is by sudden convulsions attended by fever and vomiting. Symptoms may last 132 days (1 to 2), or 1 to 2 weeks. Acute symptoms subside, and then patient is discovered paralyzed, generally hemiplegic. Usually cerebral nerves are not implicated. The right side is oftenest affected. As child recovers, the muscles affected waste, reflexes are exaggerated, but do not exhibit reaction of degeneration under electricity. Secondary,—degeneration takes place down the cord, then muscles are rigid, or have mobile spasms, or chorea like. The affected limbs occasionally have Jacksonian epilepsy, no loss of consciousness. Such children will be idiotic or imbecile.

CAUSES.—Thought to be due to thrombosis, or embolism, or local inflammation, or inherited syphilis. On examining the brain, atrophy of a portion of cortex of brain will be found. The atrophied part is indurated, cirrhotic. The pia mater is thickened and adherent. Often large cavities are found in the brain; these children generally recover, permanently impaired, physically and mentally.

TREATMENT.—Will depend on symptoms; if feverish and in convulsions, then put in a hot bath and cold to head. For convulsions give Bromide and Chloral, keep in dark room. For paralysis, nothing is better than constant galvanic current. Massage may be good. Bromides are now not well borne unless combined with Chloral.

XXVII. BRAIN TUMORS.

Tubercular tumors are most common, usually are secondary to tubercle elsewhere. Are found oftenest in cerebellum and medulla. 2. Syphilitic growths are next commonest, affect chiefly the meninges, the pia mater, rarely the brain substance. 3. Glioma (small round celled-sarcoma) is next in frequency, and is the only one a growth of the brain substance, not encapsuled. Is found in ant. lobes of brain mostly, is subject to hemorrhage from rupture. 4. Sarcomatous growths, various, are next in frequency. 5. Cancer is next in frequency. All other forms are rare except small. 6. Aneurismal tumors. Violence is the only exciting cause of tumors we know of except tubercle and syphilis.

DIAGNOSIS OF TUMOR.—Depends on local symptoms; so if tumor is in area, not functional, will be latent as in cerebellum, in sphenoidal or frontal lobes. If patient suffers from fixed, violent, paroxysmal, constant pain, if there be impairment of any of special senses, especially of sight, and especially if this be accompanied by optic neuritis, also if this impairment of special senses be not accompanied by motor symptoms. Or if there be twitchings, localized, and especially of the cerebral nerves (all indicating local lesion), especially if the symptoms come on slowly and progressively, and if mind remain intact. If in addition there be local convulsions, unilateral without perhaps paralysis in interval,

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the probability of tumor becomes greater. Apoplectic symptoms occurring with this history indicates glioma. It is unusual for symptoms to set in suddenly with paralysis, apoplectic symptoms, etc. Localization of tumor—if at base, remember the cerebral nerves lie there, hence a common symptom is paralysis of one or more of these. Pressure of direct pyramidal tract may lead to paralysis of limb or hemiplegia from pressure on optic tract. Optic neuritis is almost always present. These local lesions may be unilateral or bilateral. Tumors of convexity of brain—There lie the motor convolutions, anterior lobes for mental faculties, sensory centres for hearing, seeing, etc., so symptoms would be accordingly. Probably at first irritation of these centres leading to convulsive paralysis, impairment or loss of intellectual faculties, of speech, hearing, sight, etc., you would not have disturbance of cerebral nerves, for these are at base. Tumor of middle lobe of cerebellum.—If it involved lateral lobes you get no symptoms, but if middle lobe then you get most noted symptoms—is alteration in gait like a drunken man—not affected by shutting of eyes as in locomotor ataxia. 2. Giddiness, even without bad gait, even lying down. 3. Knee jerk usually absent, but not constant. 4. Often a violent pain in occipital region, sometimes with retraction of cervical muscles. 5. Marked vomiting. If tumor of cerebellum pressed on medulla, we would have paralysis; epileptic convulsions rare, but disturbances of sight common. If middle peduncle of cerebellum be affected it gives rise to circular movements.

COURSE OF THESE TUMORS.—Often give rise to meningitis, sometimes to apoplexy. A tumor growing and halting is syphilitic or tubercular.

TREATMENT.—Depends on their nature. If syphilitic or tubercular, treat constitutionally; if meningitis be set up, treat as such. If you are in doubt, treat with Pot. Iod. All these brain tumors except glioma and cancer are outside of brain, in membranes, hence can be enucleated by surgery.

XXVIII. CEREBRAL SYPHILIS.

MORBID ANATOMY.—1. Frequently attacks arteries, arteritis may be apart from a gumma or in a gumma. A quantity of fibrocellular tissue thickens inner coat, then outer coat thickens, leads to narrowing of lumen, hence tends to produce thrombosis, softening, etc. 2. Aneurism from disease of coats of arteries may give a tumor or may lead to hemorrhage. 3. Syphilis produces neoplasms of soft grey cellular structure or caseating gumma. These begin in dura or pia, not in brain but extend into brain. May be situated at base, and then tend to involve the nerves. 4. The disease may assume form of a local chronic meningitis, producing great thickening of part of membrane, and so even acting as a growth. 5. Sometimes it sets up a chronic interstitial inflammation of substance of brain or cord, produces wasting of convolutions, affects chiefly motor areas. 6. Frequently attacks coats of nerve, hence neuritis.

EFFECTS.—If arteries are obstructed, non-inflammatory softening follows of area affected. Two vessels are especially liable to be affected, viz., internal carotid and middle cerebral artery, hence motor convolutions, optic thalamus deprived of blood by plugging of middle cerebral, so one-sided paralysis and asphasia are

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common. An aneurism might burst, hence hemorrhage. If gumma is present, signs of a tumor are observed. If meningitis be present it is of low and chronic form. It is usually in connection with a gumma, and its effect is to add to growth of tumor.

SPECIFIC DIAGNOSIS.—Prodromal symptoms—persistent headache aggravated at night, often accompanied by local pain in scalp. Also sleeplessness. Among earlier symptoms are dizziness, mental confusion, impairment of memory, slowness of thought and speech; or the opposites, viz., irritability, etc. The overt disease declares itself suddenly, symptoms according to locality and form of lesion. 1. A grouping might be physical and mental disturbance, incomplete epilepsy and paralysis, especially when convexity of brain is affected. End is coma, duration of attack short. 2. Apoplectic attack followed by hemiplegia associated with drowsiness. In addition, signs of unilateral irritation of brain, one-sided convulsions, etc., or neuralgia, and usually paralysis of some of cerebral nerves. This form may be basilar or of convexity, but this form may be sudden, paralysis of a cerebral nerve or sudden aphasia or hemiplegia. 3. Group like general paralysis of the insane.

TREATMENT.—First treat active symptoms of the attack as of apoplexy, meningitis, etc. When symptoms are active, "Wood" recommends bleeding to relieve congestion. Syphilitic treatment. A course of Mercury at once by inunction. From 30 to 60 grs. of Blue Ointment, daily to rub in, with a thorough warm bath between each inunction. Continue for 2 weeks, then every other day for 2 weeks, then twice per week for 3 to 4 months. Watch guns. Another method is by Pot. Iod. Give it in enormous doses (American) 30 gr. T. I. D., run up to even dr. 2 doses—no limit to dose till results are reached. Give it in Vichy Water or as per Wood. Syr. Sarsa Co. and Fld. Ext. do equal parts with the Iodid. Many add gr. $\frac{1}{3}$ th to $\frac{1}{10}$ th Hyd. Perch. to the Iodid.

XXIX. FUNCTIONAL AFFECTIONS.—EPILEPSY.

A paroxysmal loss of consciousness of chronic character, attended with convulsions and a non-febrile disease. Two divisions: 1. Idiopathic, no morbid lesion. 2. Symptomatic, as from some organic disease. Is also divided according to severity into *epilepsia major* and *epilepsia minor*. Epilepsy is said to be preceded by an "aura" or prodroma—is the commencement of the fit, and which is perceived by patient. The aura may affect any part of nervous system. Premonitory symptoms: psychic,—sudden failure of memory or confusion of thought, strange ideas, sense of strangeness, an emotional condition, as irritable, cross, timid, fearful, etc.; sensory,—as disagreeable choking in throat, lump in epigastrium, feelings of dyspnoea, palpation, headache, dimness of vision, diplopia, flashes of light, hallucinations of vision, colored lights, hearing disturbed; motor,—squinting, movements of pupils, shudderings of body, sudden movements, spasms. These *auræ* are really a part of the fit.

A COMPLETE FIT (major) is often ushered in by unearthly scream, person falls down unconscious completely, and often is very pale. A tonic spasm of muscles is also noted at same time. This is a peculiarity of epilepsy, tonic spasm at first. In consequence of this the breathing is arrested, pulse gets feeble, face

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gets blue, jugulars distended, carotids throb, pupils dilated. After a few seconds spasms become clonic, therefore respiration begins to return, cyanosis disappears, breathing is labored, gurgling in throat, pupils oscillate, chewing movements of jaws from clonic spasm; frequently semen, urine or feces is discharged. A third stage succeeds this, return of consciousness is gradual. He awakens in alarm, astonishment or anger. He makes half voluntary movements. Respiration slow and labored. Stupor present, passing into sleep. Face pale and cold, perspiration noted. After a sleep more or less prolonged, patient recovers consciousness with a headache and pains in muscles, sore all over. In true idiopathic affection these are the only effects, still patellar reflex is gone for first few seconds, returning in intensity in a short time. In severe fits there may be punctiform ecchymosis on forehead. In epilepsy gravior these sequences are as a rule as above, indicates cortical derangement.

IN SYMPTOMATIC EPILEPSY, as from tumor, you may have tonic spasm present first, or clonic, or clonic altogether, no regularity, and as a rule loss of consciousness is not so sudden.

EPILEPSIA MINOR (Mittor) presents a great many varieties. Thus there may be only sudden loss of consciousness and no spasm, or with only twitchings; or the loss of consciousness may be but momentary, a mere giddiness sometimes. In another variety there may be spasms and no loss of consciousness, or but faint. In fact the various auræ may be looked upon as epileptic fits if they go no further.

GROUPS OF PETIT MAL.—1. Sudden momentary unconsciousness, fainting fits momentary, or sleepiness without spasm. This class constitutes 33 per cent. of cases. 2. Giddiness constitutes $\frac{1}{3}$ of cases. 3. Jerks of muscle heads. 4. Visual sensations, etc. During these attacks patients frequently pass water. In some of these cases of passing water there may be convulsions.

MASKED FORMS may follow an ordinary fit, or may replace the fit, being pathological equivalent. 1. Phases of mental aberration, unexplainable actions, mania, kleptomania. 2. Or there may be perversion of consciousness and a low degree of volitional power. No recollection of act afterwards. 3. Sensory aberrations, see non-existing objects, have hallucinations, loss of consciousness, etc. 4. Some drop asleep instantaneously. These minor forms are known to be epilepsy because they alternate with the graver fits. Epileptic fits may occur at any time, yet 20 per cent. occur at night. The intervals between fits vary from a few hours to months. At menstrual periods there may be an aggravation. Course of disease is from bad to worse, intervals shorter, fits more frequent. In a few cases intellect deteriorates even to dementia. This is not the rule though. What forms threaten dementia: 1. If they set in late in life. 2. If they are of petit mal type. 3. If fits are frequent. Caesar, Petrarch, Mohammed, Napoleon were epileptic, so epilepsy is not incompatible with good brain power.

COMPLICATIONS.—Occurrence of mania, furious, dull or gay, sets in suddenly and violently. The most dangerous insanity is epileptic. 2. Apoplexy is very rare, even in the fit, so is meningitis (hopeful if it does not occur). 3. Paralysis

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is rare, partial after Jacksonian epilepsy, disappears usually in from few minutes to few weeks. Cause of paralysis is exhaustion of centres.

PATHOLOGY OF NERVOUS DISEASES.—Leibig (?) Theory. The fundamental cause of all nervous disease is to be sought not in irritation of peripheral nerves or vasomotor disturbance, but in a primary and often inherited vice or morbid disposition of nervous system. This vice of nervous system consists in a tendency on part of nervous centres to accumulation and discharge of nervous force, and the concentration of this discharge from different centres determines the neurosis. The immediate antecedent of an attack is one of unstable equilibrium and gradually accumulating tension. The restoration of this equilibrium is regained by the nerve storm expending itself. Gowers accepts part of foregoing, but says instability of centres is due not to accumulation of nerve force, but to reduction in controlling power of the nerve cells over the discharge, and due to imperfect nutrition of cells.

CAUSES.—It is now generally held that the cause of instability arises from a slight disturbance in nervous system, which can be inherited, but may also be acquired. Epilepsy is inherited in 33 to 35 per cent. It is believed other neuroses in family may predispose to epilepsy, it being an equivalent. The intimacy between epilepsy and insanity is greater than with any other neurosis. Re age—under 10, 29 per cent. of cases occur; under 10 to 20, 46 per cent. of cases occur; under 30, 90 per cent. of cases occur. So it is a disease of early life. After 30 it becomes a rare disease. If it attacks one after 60 it will be a male. Hereditary syphilis especially predisposes to epilepsy.

IMMEDIATE EXCITING CAUSES.—1. All intense or oft-repeated functional disturbances or shocks to nervous system act thus, as fright and prolonged mental anxiety, also overwork excessive venery, masturbation, blows on head, sunstroke, etc. 2. Acute disease occasionally brings about idiopathic form. Thrombosis, embolism, encephalitis after (1) scarlet fever, (2) measles. 3. Typhoid, rheumatism may explain epilepsy when it succeeds hemiplegia. The first three are often followed by epilepsy without preceding hemiplegia. It is quite possible in these cases the specific poison may have effected the change, so also alcoholism, lead poisoning, etc., may act. So does the specific virus of syphilis. 2. Reflex influences, as indigestion, worms in children, delayed or absent menstruation. When predisposition to epilepsy is strong any reflex may start it. 3. Occurring in children $\frac{2}{3}$ of cases succeed teething convulsions, and children are generally rickety.

CAUSES OF SYMPTOMATIC EPILEPSY.—1. Such lesions are tumors, indurations, pressure of spicule of bone on membranes, etc., may cause epilepsy. 2. One of commonest causes is an adherent dura mater to the brain. 3. Brown-Sequard artificially produced epilepsy in rabbits by half dividing cord in dorsal region, and their offspring inherited epilepsy. Epilepsy is a neurosis, so no constant lesion has been found, so it has no morbid anatomy. In the symptomatic form you will of course find tumor, induration, etc. The seat of primary change in brain is in dispute. One says the medulla and bones is the starting point extending

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secondarily to cortex. The more modern view is that it is primarily from a discharge from cells of cortex. It is admitted it may be from the cortex or the basilar ganglia. Diseases which most frequently originate convulsions are cortical. In idiopathic epilepsy convulsions sometimes are local, so too cortical lesions cause local manifestations, hence proving cortical origin of epilepsy. The "aura," intellectual or emotional, also point to the cortex. So weight of evidence is that in ordinary epilepsy the discharge is cortical. Loss of consciousness is owing to the sudden discharge of nerve force, temporarily affecting consciousness.

TREATMENT.—During the attack prevent him from injuring himself, unloose necktie, place cork between teeth to avoid biting tongue, give plenty of air, etc. You cannot shorten fit. If on coming out of fit he be maniacal, give Chloral and Bromid. or Camphor and Chloric Ether. In cases of rapidly recurring fits you can cut that short by Chloral grs. 15 every 3 hours, or hypodermic of Morphia gr. $\frac{1}{4}$ th. Inhalation of Chloroform or Ether will do same. In severe epileptic fit do not give Morphia, lest coma of fit and Morphia coincide, hence death. To ward off fits after aura is perceived a tight ligature above aura sometimes works. Some will wear a loose ligature about arm or leg, when aura is always given in same place. It has even worked on opposite limb, so it may work through a mental impression. A powerful mental emotion, violent exercise, etc., will sometimes prevent the fit. To cure, the Bromides are the best, given for years, till fits have ceased to recur. It at least will diminish frequency of fits. In some, attacks will cease while Bromide is taken—50 per cent. There was improvement in 66 per cent. It is not known how Bromides act unless to render stable the nerve cells. Rules of dosing — increase dose till you get results, as lessening frequency and force. R. by Brown-Sequard. Pot. Brom. 1 oz., Pot. Iodid. dr. 2, Am. Brom. dr. 3, Sodium Bicarbonate dr. 1, Am. Carbonate if weak patient, Inf. Calumbæ oz. 6, Sig. dr. 1 before each meal and dr. 3 at bed time. As a general rule dr. 1 per day will do, given as you like. The Pot. Bromide is the best of the Bromides. The patient should not intermit a dose for years. Dr. Gowers when he has checked the disease tries very large doses to try and influence the nerve cells. He gives large doses with increasing intervals, dr. 2 every 2 days, dr. 3 every 3 days, up to oz. 1 every 5 days, the only ill effects being headache and occasionally enfeeblement of mind temporarily. Sometimes Bromides fail, but act if combined, as with Digitalis m. 5 in weak heart, or Belladonna m. 5 to 10 if patient continues to have petit mal, and especially Arsenic m. 2. Indian Hemp frequently does good combined with K. Br. Gowers says if there is anæmia to give Iron. If Bromides have failed, Borax gr. 15 to 30 T. I. D. sometimes gives good results, may cause psoriasis. Nitroglycerine sometimes cures in dose of gr. $\frac{1}{15}$ gradually increased to $\frac{1}{25}$, give as pill or in the 1 per cent. solution.

COUNTER-IRRITATION.—Blisters to back of neck, use of actual canterbury, setons, etc., have done good, generally fail.

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SURGICAL TREATMENT.—Trephining is coming into fashion. If you suspect a tumor, of course operate. If there be a depressed fracture, then operate. Yet operations have not as a rule been successful, perhaps because too late. Nerve cells have acquired the habit of discharging.

MENTAL AND MORAL TREATMENT.—Inspire confidence, so that he will take drugs hopefully. Avoid extreme mental and bodily work, yet still he must not be idle. If it be in a child, inculcate habits of self-control, with a will to control emotional nature.

DIETIC TREATMENT.—No rules can be laid down. They require to be decently fed, still in some cases meat will increase, in others decrease, the tendency. Do not go to bed on a full stomach.

XXX. CHOREA.

St. Vitus Dance is divided into magna and minor by Germans, but English do not regard magna as chorea, it is more hysterical. In 15th and 16th centuries were supposed to be possessed by demons, hence St. Vitus' shrine at Strasbourg was favored by them.

SYMPTOMS.—May have premonitions, may not. Disease may come on slowly. Prodromita may be indigestion, constipation, depraved appetite, or nervousness, as timidity, fretfulness, etc. The state of health attendant on rheumatism may alternate with it. Menstruation at puberty, pregnancy, may predispose.

THE OVERT DISEASE.—Has among first symptoms a hurried manner, clumsy movements, twitchings of face, extremities, more common on left side. Peculiar muscular movements are characteristic of this disease, may accompany voluntary movements or not. If during voluntary movements the fact to be noted is, want of co-ordination, no accuracy in movements. In walking, leg will be jerked, progression thereof difficult. A common appearance while examining is child keeps affected arm to side (note a spasmodic rotation) so as to hide it. Spontaneous movements are especially characteristic, as constant movements of muscles of face, especially of tongue. Speech in severe cases is impeded, difficult or impossible, even laryngeal muscles choreic, ditto respiratory muscles. The head is often tossed or jerked. These movements usually cease during sleep, are aggravated in presence of strangers, ditto by emotions, when they speak, etc. Sometimes undergo periodical exacerbations. In time muscles are flaccid, weak, muscular power affected or defective. Common or special sensation is seldom disturbed, still hemi-anesthesia has been met with (hysterical). Patient is apt to be fretful, gloomy. A common symptom is inability to concentrate, to attend to anything, failure of memory. In long standing cases mind is thus impaired. Organic functions may not be affected or may, as digestion wrong, urine high, S. G. (urea and sulphates) (phosphates nervous). It is a non-febrile disease as a rule, but in severe cases temperature may go up to 102. Some affection of heart is frequent, due to anemia, a systolic murmur over base, a mitral murmur

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at apex. May be due to vegetations on valves (has likeness to rheumatism). Heart failure is a sequence, regurgitation along the organic disease, or muscular failure. Walsh thinks chorea of papillary muscles causes the regurgitation. So we have anæmia causing hæmic murmurs, heart weakness causing regurgitation.

COURSE AND TERMINATION.—Declines gradually and completely in 8 to 10 weeks, getting well in 2 months. If it exceed 3 months will be difficult to treat. Occasionally it proves fatal, only in acute forms, convulsions severe. The limbs may need tying, convulsions are continuous, no sleep, child wears out and dies in 3 to 10 days, or 9 to 20 days is the range. Like other neuroses, the occurrence of an acute disease, as smallpox, typhoid, etc., will cause disease to cease, and often cure it. Relapses are frequent in chorea. If death occurs it is from exhaustion, or from other lesions, pericarditis (rheumatic). It seldom attacks old people, if it does is incurable.

CAUSES OF CHOREA.—Predisposing—age one of most striking; is a disease of later periods of childhood, 9th to 15th year, but has even occurred in infants. Not over 5 per cent. of cases occur after 20. It is also met with in advanced life, senile chorea, but is of a different nature, occurs independently from rheumatism, is intractable, etc.

SEX.—3 times commoner in females.

RACE.—Negroes are more exempt, ditto Indians.

HEREDITY influences. The taint may be maintained or manifested in other neuroses, as epilepsy, neuralgia, etc. Other members of family suffer from chorea in 14 per cent., other neuroses are found in 50 per cent. Co-sensitive, impressionable, nervous habit of mind predispose, this may be inherited or acquired, as by indulgence, bad habits, etc. Nutrition,—a badly nourished state predisposes to it; exciting causes,—shock to nervous centres, fright the commonest; powerful mental emotions, especially anxiety, anger, etc. The interval between shock and disease is usually a week, but may be longer or shorter, or no interval at all. Imitation influences, is apt to be of a hysterical form, may act by influences of habit, "mocking is catching," or it may act through fright on seeing a choreic patient. It is supposed some nutritional change in nervous centres must be brought about by fright to produce such effects, a predisposition probably existing. The special reason why shocks produce chorea in children depends on the age. They are educating their motor centres. Those are not fully developed, yet are highly exercised, hence liability to equilibrium being disturbed. Blows upon head are also exciting causes, may be from fright accompanying the injury. Reflex causes not common. The common one is worms, also decayed teeth, but are rare causes. Irritation of peripheral nerves, as crushed finger, has been followed by chorea, so also irritation of dura mater may act. Mental strain, in childhood, due to present system of education, is a frequent cause.

RHEUMATISM.—Acute rheumatism has a remarkable connection, preceding chorea in 26 per cent. The rheumatism may occur during the chorea, or it may alternate with chorea, acting like an equivalent. Acute rheumatism may also follow

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chorea. Some will have a strong rheumatic family history, even as high as 45 per cent. Heart disease is often associated with chorea, may precede or accompany it. Gowers says the heart disease preceded in half the cases. Endocarditis often follows chorea. No nervous theory can account for endocarditis, hence rheumatism, not chorea, causes these heart troubles. Some say both chorea and endocarditis are but manifestations of rheumatism. In chorea it is the same valve damaged, mitral as in rheumatism. It is generally in first attacks of chorea that endocarditis occurs. In chorea from pregnancy there has been either a previous attack of chorea or rheumatism. Senile chorea occurs without rheumatism. Dr. Howard has never seen chorea in a rheumatic person. Only in children can rheumatism develop chorea. Pregnancy is a rare cause of chorea. A common apparent cause then is fright, but they have had chorea or rheumatism before. This form is grave, fatal 12 to 30 per cent. The period in pregnancy is about third month, is most common in first pregnancies. Is often attended by delirium.

THEORIES—Embolic, that tiny emboli swept off from the valves lodged in brain in certain areas (corpus striatum, etc.), and so cause chorea. But when people have died, the postmortem does not shew this appearance often. Again, fright could not produce emboli from heart disease in so short a time. The essence of true chorea is an unstable condition of nerve centres, together with their imperfect nutrition. This may be brought about by causes already mentioned, disturbing the equilibrium between stimuli (volitional or sensory) and the motor response, so a sort of inco-ordination occurs, a delirium of motor centres.

TREATMENT—Try and find exciting cause, as worms or irregular bowels, nervous stimuli, etc. Improve nutrition and tone up nerve centres and improve constitution of patient. Tonics, good food, change of air and scene are good. At once take from school and send to country. Child may need rest at first, moderate exercise afterwards must then be taken, never exciting exercise. If there be marked debility, then give alcohol. Extra sleep is needed. Arsenic and Iron seem to be curative. The Carb. of Iron, Fer. Redact., Fer. Dialyz, Vin Ferri are all good. But Arsenic is better than Iron. Give in large doses. Give child of 6 years m. 3 T. I. D., increasing a drop per day till 12 to 15 drops are reached. If intolerance is reached, stop dose for a short time and give again. Give Arsenic in heroic doses. There is a marked tolerance of Arsenic in this disease. It is usually given by the mouth. In some obstinate cases give the Arsenic hypodermically, use Liq. Fowler (minus Tr. Lavender Co.), which is irritating. The Salts of Zinc are valuable as nervine tonics, giving in large doses, starting with gr. 1 and gradually increasing. Strychnia is sometimes useful, use Bromide of Arsenic or Hyoseyanus. Cod Liver Oil is needed for bodily nutrition, giving at same time as the drugs. If sleep is not obtained, give Chloral, not Morphia. Cures have been effected by Chloral, keeping asleep for two weeks. In acute cases keep patient in bed in a dark room. In chronic long standing cases, give systematic exercise, rythmical, as dancing, to overcome the irregular movements. Gymnastics and calisthenics are useful. Moral treatment—the children may be

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very emotional, indulging their passions. In extremely violent cases the limbs may need strapping up in cotton wool and splints applied to prevent injury.

XXXI. NEURALGIA.

Is defined as a functional disease of nervous system, not due to a primary lesion, organic, either of nerve trunks or their centres, declaring itself by pains in the course of sensory nerves, usually unilateral, intermittent, sometimes periodical. At first unaccompanied by inflammation at seat of pain or fever.

SYMPTOMS of general neuralgia:—Besides above the state of health at time of attack is impaired, patient is anæmic or has been fatigued, or recently been sick and debilitated. Or if general health be good, then there is a tendency to pains, numbness, etc., in the limbs, in parts which will afterwards become neuralgic. All depressing causes aggravate the pain when present. The pain is paroxysmal in all its stages, remissions occurring. The paroxysm may last seconds, hours, days, so may the intermissions. The pain is spontaneous, is apart from local stimulation. Is a darting, boring, burning, tearing pain, is excruciating in the paroxysm, duller between. The pain follows sensory nerve or a definite spot in its distribution. Hyperæsthetic spots may also be found: 1, as where nerves emerge from skull or vertebæ; or 2, where they pierce fascia; 3, or where they become cutaneous. These tender spots occur only in protracted cases. Neuralgic pain is aggravated by sudden movements, by pressure (pointed), by cold and heat. There is an absence of fever in neuralgia. If it is severe or protracted there may be

SECONDARY EFFECTS, due to disturbance, extending from primary nerve to others. Thus the special senses may be affected, amaurosis, amblyopia, dilatation of pupil, deafness, loss of taste or smell. Secretion may be increased on same side, as lachrymation, salivation, unilateral sweating, unilateral discharge from nose. Along with these secretions is a flushing of same side of face from disturbance of vaso motor nerves. Nutrition may also suffer, hence unilateral hypertrophy of skin, periosteum, etc., blanching or falling of hair unilaterally, or glaucoma iritis, herpes Zoster, patches of erythema. The motor functions may also be thus disturbed, so also sensation with hyperæsthesia or anæsthesia. These grave results only come from severe and prolonged cases.

CAUSATION.—1, Symptomatic; 2, idiopathic. 1. From local lesion of a nerve, either at central origin, in its trunk, or at its periphery, or it may be mere irritation, as when following bruise. The neuralgia is then symptomatic. Or by pressure of tumors, or action of new growths, local interference. Its clinical features differ somewhat from idiopathic form, for pain comes on gradually, remissions less marked. Serious derangements of tissue are apt to occur, pain is harder to treat. 2. When nerve is seat of irritation, the manifestation may be in some other nerve. This is seen best in eye, myopia, astigmatism, etc., leading to neuralgia; also catarrh of nose, especially if accompanied by hypertrophy of mucous membrane of inf. turbinated bone; also irritation of any sensory nerve, as by ovarian tumor, gallstones, calculi, etc., caries of teeth. But

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there must be a predisposition to neuralgia when slight causes so act. 3. Shocks to nervous system, especially powerful mental emotion, also overwork, depressing emotions, etc. When from shock, from concussion, an interval may elapse before neuralgia appears. 4. Neuralgia from malaria. 5. Neuralgia from poison, lead, rheumatism, alcohol, gout, etc. Lead, alcohol and gout may also produce neuritis,—a different thing. 6. From anæmia and malnutrition, thus hyperlactation, excessive child-bearing, leucorrhœa, etc., act. Neuralgia is the prayer of the nerve for more blood. 7. Age—is a disease of adult life, but some forms, migraine, may occur in children. There are 3 special periods:—1. In early adult life, 14 to 25 years, while sexual functions are being developed, affections, emotions being developed, and moral responsibilities first felt. 2. From 25 to 45, during the battle of life, and at end of this woman's climacteric occurs. 3. In old age we get the worst forms of neuralgia. It may be epileptiform neuralgia. This is characterized by sudden onset of pain, which is atrocious, formation of tender spots, spasmodic tic. You can only temporarily relieve. These patients frequently go insane, or they get despondent. The disease lasts for years, patient dies worn out. Cold is an exciting cause frequently. In many cases, no cause at all can be ascertained. Neuralgia is often inherited, not so often as migraine, still 25 per cent. is inherited. In the family are found equivalent neuroses. These persons are nervous, excitable. Neuralgia is divided into 2 varieties: external or superficial and visceral varieties.

EXTERNAL FORMS.—Migraine, special nerves, trifacial, cervico occipital, cervico brachial, intercostal sciatic, aurial, coccygodynia, or any nerve.

VISCERAL FORMS.—Gastric, enteralgic, hepatic, cardiac (angina pectoris), ovaro-uterine, renal, rectal, vesical, urethral, testicular, or any organ.

PATHOLOGY.—The seat of pain in idiopathic form is the nerve cells from which the nerves arise. It is not the ganglia of post fibres of cord, but of cells in post horns of cord or in sensory centres in brain. Call neuralgia a nerve storm discharging from the sensory centres. Not only is neuralgia hereditary, but is associated if not inherited directly with other neuroses. Hence an inherited defect in the construction of or conformation of the nerve centres, a feebleness or instability of the composition of the nerve cells, which render them unequal to the demands of everyday life, render them very susceptible.

TREATMENT.—Find out cause, if you can examine eye for defects nose for catarrh, teeth, etc., or ascertain any constitutional disease, as syphilis, anæmia, diabetes, and treat them. Their cure may cure the neuralgia, but not always. Therapeutics—improve nutrition of nervous system and general health. For nutritive remedies, fats are very good, especially Cod Liver Oil, butter, cream, etc. Let diet be of a nutritious character. Forced feeding after Wier Mitchell's plan may be needed. Prolonged rest of body and mind may be needed in some. Exercise may be needed; if too weak, massage may be substituted. Change of habits, of climate, etc., wearing of warm clothing is necessary, baths and friction to the skin.

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REMEDIES.—Nervine Tonics, as Iron, Quinine, Arsenic, Strychnine, or Nux Vom., Phosphorus and perhaps Salts of Copper and Zinc. Quinine is especially valuable if you suspect malaria, is especially valuable in neuralgia of the (5th). Arsenic is also useful, as above, or in advanced life with degenerated tissues. Zinc Salts, Oxide gr. 2 to 10, and Sulphate gr. 1 to 4, Valerianate gr. $\frac{1}{2}$ to 4, the last for hysteria with neuralgia. Phosphorus is often used, only sometimes gives good results. Give as a pill, dose gr. $\frac{1}{50}$ th to $\frac{1}{25}$ th. Iron is used in anemia, is a nervine also, combine with Strychnia and Arsenic.

ANODYNE REMEDIES, as narcotics and stimulants, Opium is best—Morphia, be careful lest the habit is acquired. Most cases of habit are formed from neuralgia. Belladonna, Hyoscyamine $\frac{1}{100}$ gr. Hemp good. Aconite, Ether, Alcohol, Am. Chloride, Cocaine. These remedies seem to act best hypodermically. Do not begin with over gr. $\frac{1}{5}$ th Morphia, B. I. D. It is well to inject into site of pain, or in course of the nerve. This is necessary in the gravest forms where some lesion must exist. Cocaine gr. $\frac{1}{2}$ to 1 is also a good substitute of Morphia, inject into part. Atropia gr. $\frac{1}{120}$ to $\frac{1}{160}$ th ($\frac{1}{120}$ to $\frac{1}{160}$ th) injected in part, or Ext. Bellad. gr. $\frac{1}{8}$ th, are also good. You may alternate Morphia and Atropia. Bellad. is especially useful in pelvic neuralgia. Indian Hemp gr. $\frac{1}{4}$ to $\frac{1}{2}$ is especially useful in Migraine, also suits other forms as well. Caffeine gr. 1 to 5 hourly. Guarana Powder dr. $\frac{1}{2}$ to 1 hourly. Gelsemium, in dental neuralgia, tie, etc., push till physiological effects are produced. If Fld. Ext. is used, begin with gtt. 5, increasing to gtt. 15 T. I. D., or Gelsemine hypodermically will do. Tonga Fld. Ext. dr. $\frac{1}{2}$ to 1, T. I. D. Aconite or Aconitia in gr. $\frac{1}{400}$ in granules, this last can be given every 5 hours, up to gr. 1 to 120 doses. When Migraine is accompanied by flushing of face, give Ergot; if pallid face, give Amyl. Nitrite. In some forms (hepatic) gr. 20 to 60 of Am. Chloride is good. Sulphur. Ether is good in visceral neuralgia, Angina Pectoris, Gastralgia and ovarian neuralgia. Alcohol may be good; beware of habit. Neurotics are more apt than all others to get a love of liquor, or Opium. Alcohol without doubt is a powerful agent to relieve neuralgia, but only resort to it in extremes, lest habit be induced, for the more highly nervous the patient be, the more apt to get the habit. Antipyrine is a prompt and powerful anodyne, is used especially in Migraine, gr. 15 may be repeated twice per day. Antifebrine has also a similar power. External means—blister over seat of pain or over spinous process of nerve affected will often benefit. More powerful counter-irritation is sometimes used, as actual cautery to region of origin of nerve from spinal column. Anodyne liniments—Aconite or Chloroform Lin., separate or combined, are good; Chloral and Camphor also are good; Aconitine Ointment is good; Menthol is good thus: R. Menthol three parts, Chlorof. four parts, Olive Oil nine parts (scintica). Cocaine is also good. Osmic Acid 1 per cent. sol. in water, or Glycerine 8 to 12 drops hypodermically, has cured obstinate cases, blackens skin at part. Electricity, galvanic, is also powerful for good, more useful than faradic. If you use faradic let current be weak and interruptions rapid. In epileptiform neuralgia you have to use large doses of anodynes, excision or stretching of nerve, etc.

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XXXII. DISEASES OF HEART.

TOPOGRAPHY—Heart lies diagonally, base to the right, apex to left. Extends from upper border of 3rd cart. to 6th, and transversely from $\frac{1}{2}$ in. from right border of sternum to within inch of nipple line. This is the "deep cardiac region." The superficial cardiac region is where heart is exposed by recession at 4th left cart. of lung to 5th rib, inside nipple line, dropping to 6th rib. The dimensions are 2 inches vertically, $2\frac{1}{2}$ transversely, *i. e.*, of this area. The two auricles lie under 3rd cartilages and spaces above and below these, the left auricle encroaching on 2nd space, the right on the 3rd space. The right ventricle lies nearly in front, the left ventricle with exception of ant border lies behind.

The right apex beat is half way between nipple line and sternum. From this point the right ventricle runs along till it meets the right 6th cart., then up $\frac{1}{2}$ inch from right edge of sternum. So right ventricle lies one inch to left and $\frac{1}{2}$ inch to right of sternum. The apex beat in man is in 5th space, about 1 inch inside nipple line and $1\frac{1}{2}$ to 3 (2) inches below nipple. This beat produces a visible pulse, visible over one inch square. The valves—The pulmonary valves are behind junction of 3rd cart. at left edge of sternum. The aortic are in lower down and a little toward middle of sternum. The tricuspid are in middle of sternum, running obliquely from 3rd interspace to 4th. The mitral lies in 3rd interspace. So a stethoscope would include all at once. Then look elsewhere for sounds. At aortic cartilage, second right; at pulmonary cartilage, second left; at apex for mitral, etc.

XXXIII. PERICARDITIS.

May be acute, sub-acute or chronic. Inflammation produces same changes in it as in pleura, for it is a serous membrane. So products may be:—1. Plastic, little effusion. 2. Serous. 3. Scrofulous. Slow of absorption, much solids. 4. Pus—pyopericarditis. 5. Hemorrhage, owing to the contractions of the heart, its constant movements. The heart becomes covered with nipple-like processes,—pineapple heart. The deposits greatest on the visceral pericardium. This affection surrounds the heart, hence the inflammation extends to the muscles of the heart, producing myocarditis, hence the brown color, flabby, easily torn muscle; hence the danger. Sometimes in chronic pericarditis the lymph acquires a villous appearance, owing to the effusion preventing contractions of the adhesions. When the disease becomes chronic, enormous thickening of both visceral and parietal pericardium occurs with or without adhesions.

SYMPTOMS OF ACUTE PERICARDITIS.—Invasion is usually insidious because it is generally a secondary disease, chiefly of rheumatism, of acute pleurisy and acute pneumonia, so characteristic symptoms are absent. You get pain in pericarditis, oppression there, an increase of the previous fever, etc. The pain is referred to region of the heart, is increased by pressure on the intercostal spaces there, on the epigastrium or on the ensiform cartilage. That is direct pressure. Sometimes the pain is referred higher up between insertion of the mastoids

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(phrenic nerve). Pain is increased by deep inspirations. This is often due to an accompanying pleuritis, palpitation is also a common symptom. Fever is more or less present, but the temperature is not increased much, 102 to 103; the pulse may become irregular, is generally accelerated, soft and compressible. When effusion is abundant it becomes irregular and very compressible, even "pulsus paradoxus" cessation during inspiration. The respiration is affected, oppression and dyspnoea. This dyspnoea may be due to effusion or to complications as pleurisy. If effusion has taken place, the lower part of the chest does not dilate, patient lies on the back, diagonally to the left. Sometimes they are obliged to sit up on account of dyspnoea. Lean forward to take the weight of effusion off the lungs. In severer cases you have cyanosis. The fluid prevents good action of the heart, impedes circulation. Signs of cyanosis,—lividity of the cheeks, lips and fingers, profuse sweating, dyspnoea, etc., a short, dry cough is not uncommon due to embarrassed circulation of the lungs. Towards the close there may be rheumatic delirium if the case be rheumatic. This delirium is more apt to occur if pericarditis is a complication. These symptoms sometimes conceal the pericarditis, and patient is treated for meningitis, for the pain will not be complained of. If pericarditis occurs in Bright's Disease, in aneurism, mitral disease, etc., the pericarditis is often latent, only discovered by examination.

PHYSICAL SIGNS.—A smooth membrane becomes rough, heart beats more frequently and more violently, hence visible impulse is more pronounced, area much greater. In very early stage no murmur is heard, but later you get friction sounds. The friction is often double, in systole and diastole. You need to diagnose from endocardial sounds. In exocardial sounds: 1. Is not actually synchronous with the sounds. 2. Is limited to region of the heart. 3. The site of the murmur extends from day to day with the extent of roughening. 4. You will often feel the vibrations. 5. You can increase the intensity of the murmur by pressing the stethoscope. 6. Murmur seems superficial and rubbing. In endocardial, sounds are widely heard, are permanent and cannot be increased by pressure with stethoscope, yet there is an endocardial murmur in 55 to 63 per cent. of the cases as from rheumatism. The pericardial friction is only heard when the fluid is scanty, surfaces in apposition, is best heard at the base. Another cause for the murmur is pressure of a large effusion on the great vessels.

SIGNS OF EFFUSION.—Dullness on percussion, 4 ozs. of fluid being needed. Pericardium enlarges even to the clavicle in extreme cases. Outline will be triangular, apex up, base down, reaching transversely, pushing lung back, increasing the area of dullness. Naturally the murmur becomes inaudible as the fluid increases, still we have sound of friction continuing for a long time at the base, also in some cases from 30 to 40 oz. of fluid; with patient on the back the friction is sometimes heard. Heart sounds are muffled, heart's impulse lessened, often displaced upwards. One view is heart is floated up. Another is you do not feel the effects, but the base beating with stethoscope on the chest. You find the heart sounds are not synchronous with the heart's impulse on the chest wall

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A lagging, due to acting through a layer of water. An occasional sign in children is a distinct bulging over the heart.

COURSE, ETC., OF THE DISEASE.—Recovery is the rule. If dry form, adhesions may form, or white spots. If effusion be moderate, say 10 oz, it will be absorbed in 10 to 30 days, for sometimes dullness will remain, also friction, as surfaces again approximate. Adhesions will form. In slight cases there may be absorptions without adhesions, as in dry form. In some cases death results, as from paralysis of the heart from pressure or from mild earditis, weakening the heart. Death is often sudden. Syncope, as when the patient gets up to urinate. More often death is gradual, lungs congested, in venous congestion shew signs of asphyxia, as dyspnoea, pallor or cyanosis. Death is rare in acute pericarditis, but if accompanied by pleuro-pneumonia it is very fatal. In cases where death occurs it is from 20 to 30 days. Another termination is in the chronic form, which is not uncommon, as from Bright's Disease, or when the products are purulent, or from heart disease. Patient suffers from dyspnoea, recovers and relapses. Congestion of the venous system, occurs, dropsy common, heart weakens. This chronic form rarely recovers.

CONSEQUENCES OF ACUTE PERICARDITIS.—1. Adhesions if complete are not diagnosable. 2. Dilatation of the chambers, with or without hypertrophy, is a common sequence. 3. Atrophy with fatty degeneration sometimes occurs.

CAUSES.—1. Is rarely idiopathic or due to exposure to cold. 2. Traumatism. 3. Local irritation of neighborhood, as from pleurisy, or from abscesses or diaphragmatic. Ulceration of the oesophagus or stomach. 4. Tubercle of the pericardium. 5. Cancerous growths in the neighborhood. 6. Heart disease, mitral, especially hypertrophy, but rheumatism is the great cause, all other causes are rare, yet all the eruptive fevers cause it. We divide causes into: 1, rheumatic; 2, non-rheumatic. The rheumatic form is seldom fatal, the non-rheumatic form is nearly always fatal.

DIFFERENTIAL DIAGNOSIS.—Pleurisy in the neighborhood of the pericardium. Let patient hold his breath and the pleuritic friction sounds disappear, yet it is possible for the heart's beating against a pleuritic surface to cause a friction—not stopped by ceasing breathing, yet this sound will be absent at the base. Present along the left ventricle, nor does it spread. Prognosis,—rheumatic 18 per cent. fatal, non-rheumatic 91 per cent. fatal.

TREATMENT OF RHEUMATIC PERICARDITIS.—The special form of disease causing it gives the treatment, for the pericarditis is but a symptom. Some say that pericarditis not causing the trouble need not be treated. Treat the primary trouble, as rheumatism. To treat the pain use leeches, hypodermic injection of Morphia, or hot fomentations over the heart. The fomentations may be medicated with Tr. Opii, Lin. Bellad., etc. Balfour uses Chloral, thinks it anti-phlogistic. Insist on rest, and continue the salicylates, especially combined with alkalies. Some stop salicylates on account of cardiac depression, rather give a

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cardiac stimulant, support the patient by strong broths, milk, a little alcohol. Absolute rest in a horizontal position. The majority of authors give *Digitalis m.* 5 to 10 T.I.D. In this stage of effusion *Pot. lod. gr.* 5 to 10, *Pot. Acet. gr.* 10 to 15, are also added for diuretic action. A fly blister not over the heart, but in the neighborhood, is favored by some, not by others. If signs of cardiac failure, stimulants are needed,—Alcohol and *Digitalis*. If effusion is giving serious trouble, then aspirate where the cartilage joins the 6th rib in the 5th interspace, half way between nipple and sternum. It is a safe operation. If you find pus, make an incision, and put in a drainage tube.

XXXIV. ENDOCARDITIS.

In adults it is almost always the left side, before birth the right side. The inflammation almost always attacks the valves. Sometimes extends to the *musculi papillares* and cardiac walls. The parts of the valves inflamed are the parts in contact, not the edge. Here there is most friction. In endocarditis we have congestion of the subendocardial vessels, exudation and migration of leucocytes under the membrane, thickening it. Sometimes the endothelial membrane proliferates or desquamates. These inflammatory products cause little bead-like swellings on the surface, increasing to form warty excrescences. On these vegetations the fibrine of the blood becomes precipitated, increasing the size of the excrescences by a deposition of thrombus. Additional changes are: ulceration may attack the valves, abscess may form on valves, aneurism in the valves may occur. Adhesions of the valves may happen, fatty and especially calcareous degeneration, puckering of the valves by cicatrization may occur. The *chordæ tendinæ* may unite or shorten, and prevent closure of the valves, or the weak valves may rupture, so orifices of the valves may be narrowed or dilated, and become blocked by fibrin. The debris of breaking down may, if not septic, lead to mechanical consequences, thus softening of the brain by emboli. If septic, then abscesses may be produced elsewhere.

SYMPTOMS.—If in the course of acute rheumatism, or in the course of any other febrile disease, there are no initial symptoms, sometimes palpitation, now and then there is slight precordial pain due to irritation of the cardiac ganglia or heart muscle. So long as the circulation is unobstructed, the only sign is a murmur. Now and then there is headache, frequent pulse, short, dry cough and with a slight fever. In rarer instances cardiac circulation becomes obstructed by a rupture of the valve or cord or formation of a clot. The symptoms then will indicate shock, pulse feeble, dyspnoea, coldness of the face and extremities and their lividity, fitful dozing. Severe myocarditis or pericarditis complicating will cause similar symptoms. Embolism from detachment of particles of thrombus from valve is rare in acute non-ulcerative cases. If embolus plugs the large vessel in the brain it causes softening, in the kidney, bloody urine, elsewhere perhaps gangrene. Small capillary emboli give but slight bloody symptoms. Acute endocarditis may be quite latent.

PHYSICAL SIGNS.—1. Increased cardiac action, apex area enlarged, cardiac impulse stronger. An endocardial systolic murmur will usually be heard over the

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mitral valve, sometimes the murmur is presystolic, as when there are vegetations on the auricular surface of the mitral valve, and the murmur may be double.

ENDOCARDIAL MURMURS.—A mere murmur does not mean inflammation. In strong emotions you may hear a murmur. In *anæmia hæmic* murmur is always heard, first at the base and better up pulmonary artery, or an inch to the left of the sternum. This murmur is always systolic, is accompanied by a musical murmur in the veins of the neck. There will be marked signs of *anæmia*. In advanced stages the heart is weakened, the orifice is enlarged, hence tricuspid and mitral murmurs. The heart muscle weakens from malnutrition, and cannot close the orifice fully during systole, hence regurgitation. A similar adynamic murmur is often heard after typhoid, etc. Awkwardness in the use of the stethoscope will cause a murmur, especially in children, by pressing too heavily on the yielding wall. This may often happen in thin, narrow-chested people. In almost any one you can produce a murmur in pulmonary artery just at the act of expiration. Stopping onward circulation of the lungs, preventing the valves opening evenly as they should, this murmur is confined only to the first part of expiration. Pressure of aneurisms, etc., also displacement of the heart, cause murmurs. Obstruction of the orifices may cause a murmur, so every murmur is not a sign of endocarditis. You need to find out if murmur is recent or old. A recent murmur is soft, low-pitched, systolic, perhaps double. If it is purely diastolic, it is old. This endocardial murmur will change its site, extending, hence proving it recent. At apex to-day, at apex and base to-morrow. In a recent murmur there will be no history of disease, as palpitation, dyspnoea, etc., nor would the heart be enlarged. An old murmur is generally rough and high-pitched. It may be diastolic, as in regurgitation of the aorta. There will be a history of previous heart trouble, on examination you will find enlarged heart.

COURSE, ETC.—(valvulitis)—Rarely effects may disappear, vegetations absorbed or washed off. If emboli are small, no harm is done. In some cases the inflammation is interstitial and the valve may regain its strength again, with perhaps only a slight thickening (rare). The rule is permanent damage to the valve, sometimes progressive, varying with the severity of the attack. It may pass thus into chronic stage. The patient's future depends now on the amount of compensation afforded by the heart. As a rule, acute endocarditis is hardly ever directly fatal. Death is usually long after from dilatation, absence of compensation, etc., but there are exceptions, as rapid death from embolism of the brain, or if a valve ruptures, or if endocarditis is complicated by severe pericarditis. A healthy valve rarely ruptures.

CAUSES OF ACUTE VALVULITIS.—The cause is rheumatism, also Bright's Disease and chorea, attacking the mitral valve mainly. Measles, scarlet fever may also cause it. Puerperal fever, pyæmia, acute gonorrhœa, even without articular affection, or it may be from local inflammation, extending from the pleurisy, disease of the aorta, as blows on the chest; violent efforts at rowing and jumping, running, etc., is a rare cause of acute form, is a common cause of chronic form. It is doubtful if the disease is ever idiopathic.

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PATHOLOGY.—Febrile diseases are most frequent causes, but think endocarditis always is produced by irritation of bacteria on the valves acting locally, either chemically or mechanically, but above is too wide. The causes are—bacteric and non-bacteric, for cases are frequent where no bacteria can be found. Moreover, several forms of bacteria will be found in the same case. Lathro says the overheated blood of fever acts by its heat as a local irritant by inoculating experiments, the bacteria produced endocarditis only when the valves were previously injured.

TREATMENT.—But little can be done directly to control endocarditis, prophylaxis. Do not allow high temperature, since it is a possible cause, hence use antipyretics in rheumatism to protect heart. When it has occurred continue salicylates and alkalies, and add supporting agents, as Ammonia and Quinine. We have nothing which will kill the bacteria, even Cor. Sub. has been inhaled and injected subcutaneously without result. Bleeding and Pot. Iod. are not now used. Treat the original disease. If there be severe pain apply 3 to 5 leeches over the heart, or hot stupes. When signs of pulmonary congestion arise from poor circulation, then bleed from the elbow 5 to 6 ozs. The great remedy is absolute rest all through, so as to give the heart the least amount of work. Rest should include quietness of mind. If signs of cardiac failure arise, give Digitalis m. 5 to 10, or Tr. Strophanthus m. 3 T. and Alcohol, and give abundant supply of nourishment. When the patient is recovering, your duty is harder, for you cannot keep him in bed long enough. He should stay in bed till the valves are healed again, so a long rest is needed after a valvular lesion, as after rheumatism. If heart excitement be very great at any time, Digitalis is called for then as well as when the heart is failing. Dr. Simpson found permanent injury of the valves followed acute rheumatism more than twice as often when rest was not insisted on as 8 to 3, and twice as many had pericarditis also. Non-rheumatic forms—treat the disease of which the endocarditis is a secondary symptom.

ULCERATIVE ENDOCARDITIS occurs clinically in two forms: 1. Acute endocarditis, primary carditis, ending in ulceration. 2. More commonly it is secondary to a previous valvular lesion, as a tearing of an old valvular adhesion.

SYMPTOMS.—Two chief types of symptoms: 1. Pyemic form. 2. Typhoid form. The pyemic form is characterized by sudden rigors with profuse sweating between them. Abrupt fever and fall of temperature, great constitutional depression. Later on after this fever the consequences of emboli in the brain lead to hemiplegia or softening, or aphasia, etc.; if in femoral, to gangrene of the leg; if in the spleen, to pain there, swelling and vomiting; if in the liver, jaundice; if in the kidney, albuminuria; if in the skin, petechia when fine emboli block up the cutaneous vessels; in the lungs, embolic pneumonia; around the joints, embolic or secondary abscesses; in the typhoid form you have symptoms like typhoid, a moderate high fever, diarrhoea, sometimes a large spleen, patient also somnolent. Between the above two forms are intermediate ones, as like rheumatic fever, especially if you have a suppurating joint, and in



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these cases the heart may have no murmur. In other cases you may have no fever. There is also sometimes suppurating meningitis when ulcerative endocarditis follows pneumonia.

PHYSICAL SIGNS are those of endocarditis, but the murmur will change its site and quality as the ulceration spreads over to valves or to other valves. As the valves get eaten away you get a diastolic murmur, yet sometimes in spite, of extensive ulceration you get no sound.

COURSE, ETC.—The severe forms always end fatally; minor forms do recover, but it is difficult to prove they are genuine. They may destroy life in 3 to 4 days, more commonly in 3 to 4 weeks, but in other cases they become more chronic.

CAUSES.—The acute primary form occurs in rheumatism, in pneumonia, in diphtheria sometimes, and in ordinary fevers, as smallpox, measles, pyæmia; all varieties is the great cause, traumatic, puerperal, uterine, etc., even from a gumboil, splinter festering, etc. All affections of bone and pyæmia especially are liable to cause, and especially osteomyelitis, periostitis, also dysentery in bowels.

PATHOLOGY.—It has been found by experiment that the two peculiar microbes *staphylococcus aureus* and *streptococcus pyogenes* of pyæmia injected into rabbits cause ulcerative endocarditis if valves are already damaged. The blood of this animal cultivated gives products, which injected into other animals caused under similar circumstances ulcerative endocarditis. Others have found the pneumococci of pneumonia would also cause ulcerative endocarditis. Hence pathologists think endocarditis is of bacterial origin. Above proves that micrococci will cause ulcerative endocarditis if valves are already injured. Doctor thinks it a pyæmic disease, is one of the many manifestations of pyæmia. There may be two forms,—one septic, malignant; the other non-septic, hence not as fatal, due to crumbling down of injured valves producing emboli, but not pyæmia emboli.

TREATMENT is unsuccessful, as disease is very fatal. Treat as pyæmia support by Iron, Quinine, Alcohol, fresh air, good diet, etc. A successful case in which Sulpho. Carb. of Soda was given is noted.

XXXV. ORGANIC DISEASES OF HEART

Are divided into those of valves and wall.

VALVULAR DISEASES.—Causes are: 1. Malformations, congenital, most common is obstruction of pulmonary artery, or of aorta, or of valves being united, or of deficiency of septum of ventricles or auricles, etc. 2. Injuries of valves, of arteries, or heart. An injury or strain may rupture, or may set up acute endocarditis, but more commonly chronic endocarditis. For this reason aortic disease is common in laboring class, straining at work, athletics, etc. This repeated straining sets up a low chronic valvulitis. Wherever a valve ruptures, it is diseased. A case in a child 2 and 9-12, by fright, tricuspid valves were ruptured. 3. Alterations in cavities of heart, as dilatation of ventricle leading to regurgitant mitral disease, so will shortening of the valves or their cord. 4.

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Acute inflammation of valves, by thickening, adhesions, etc. 5. Chronic inflammations strains are the great cause, also atheromatous degeneration, or may follow acute form. Bright's Disease acts as a strain to cause this by the high tension. The high tension found in profound anæmia is recognized as a cause of valvular disease. 6. Degenerative diseases, as calcareous degeneration, hyaline degeneration of valve in old age thickens it. Mucoid degeneration of valve in old age a sequence of hyaline degeneration, small spots appear and liquify—fatty degeneration of lining membrane of valves, amyloid degeneration also. 7. Deposits of fibrin will obstruct by preventing closure of valves.

DISEASES of valves are obstructive or regurgitant.

AORTIC STENOSIS.—Physical signs, direct signs: stethoscope at base finds a systolic murmur, louder yet at second right cart., and transmitted up into arteries of neck. Palpation over base might give systolic thrill, caused by eddying of blood. This murmur might mask first heart sound there, but not at apex, where it may be lost. Indirect signs: pulse would be regular, size varies with size of stenosis, might be weak. In time left ventricle becomes enlarged, and might in time dilate. Breathing is not embarrassed, no dropsy, for mitral valve is competent. Pure stenosis is a rare disease. A mere murmur of aorta does not prove aortic stenosis, may be hæmic, or from a shred of fibrin hanging from valve, or roughening of coat above the valve, or cardiac malformation.

GENERAL CONSEQUENCES of aortic stenosis—Disease may last many years provided left ventricle compensates, but at any time serious symptoms may appear, even suddenly, as from dilatation, or weakened by fatty degeneration, or lowered cardiac nutrition after a long fever, or the valve may be suddenly ruptured, or fibrin may accumulate, further obstructing the orifice, and this if detached forms a large embolus with its consequences.

AORTIC REGURGITATION or permanent patency, from insufficiency of valves. Signs,—a murmur at base of heart, would be diastolic. This murmur will be heard all way down sternum, sometimes louder at right apex than at base (this murmur is frequently accompanied by a systolic murmur). The second sound of heart may be completely obscured, usually it can be heard in vessels of neck; if distinct in carotids is invariably preceded by a systolic murmur in those arteries, indicates a very serious lesion.

INDIRECT EVIDENCES.—1. Pulse—water hammer, or a collapsing pulse receded from finger so quickly. The arteries can be seen to be visibly pulsating, look at brachial at elbow. 2. Dilatation of left ventricle specially marked at apex with accompanying thickening of walls. This disease gives the largest hearts. With this dilatation you will get mitral dilatation and regurgitation. Thus, 3, retarding pulmonary circulation, hence pulmonary congestion, cough, dyspnoea, hemorrhages. 4. The right heart is affected by the pulmonary congestion, gets dilated, hypertrophied, but in time tricuspid dilates with regurgitation. 5. Hence venous stagnation, dropsy. The other sources of diastolic murmur are not common. Aortic aneurism the most common. Pulmonary regurgitation very rare;

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patent ductus arteriosus. So only aortic aneurism is to be diagnosed from. Most sudden deaths are from fatty heart or aortic regurgitation. Left heart is over-distended always, if it miss a beat, *i. e.*, a systole has extra work which paralyzes its wall, hence instant death. If caused by valvular rupture lives 3 to 4 years, if from rheumatism man may last many years, provided compensation occurs. Mode of death is usually from a systole. Acute congestion of lungs is also another mode of death. Occasionally death is from dropsy or asthenia. The powerful beat of heart may rupture a cerebral artery, hence hemorrhage.

SYMPTOMS OF FAILURE OF COMPENSATION.—Great pallor of face. Tendency to feel faint. Attacks of angina pectoris, pain in sternum, shoulders, and down area. Dyspnea, deficient circulation.

MITRAL STENOSIS.—1, Valves may be like a diaphragm, small button hole opening; 2, or may be funnel-shaped, this last congenital, is generally in early life and in women. The first may be from rheumatism. So oncoming blood is obstructed.

PHYSICAL SIGNS.—Murmur heard in mitral area, at left apex, or more frequently over body of ventricle over fourth cartilage, sometimes in the auricular area, between 3rd and 4th cartilages. The rhythm is pre-systolic. Characters,—is usually loud and harsh, the last part especially terminating in first sound of heart. It may be so long as to fill up diastolic space. It is accompanied by a pre-systolic thrill. It is not propagated to left, is localized. Indirect symptoms: pulse irregular if compensation be not good, pulse is apt to be small. When compensation is failing it is irregular in volume and rhythm. Stethoscope over pulmonary cartilage you will find accentuation of second sound, for pulmonary valves have higher tension from pulmonary tension, for there is obstruction at end of pulmonary circulation, *i. e.*, mitral valve. Sometimes there is a double sound, right heart empties itself slower than left heart, for it is obstructed. From mitral obstruction the left auricle will be dilated. Right ventricle will dilate, giving tricuspid regurgitation, venous stagnation and dropsy. The left ventricle rarely suffers. It may later on hypertrophy to overcome venous stasis. Mitral stenosis may exist without murmur, so may any cardiac lesion. The murmur is louder on left side if he stand up, or after exertion; sometimes only heard after standing up, or after exertion. Heart is often irregular in rhythm. So long as compensation is good patient does not suffer. If congenital the compensation is so good the child will be able to play like others, and will never notice it. As long as second sound can be heard at its left apex and to its left it is a good sign, compensation is maintained, but disappearance of that sound at apex indicates lessened supply of blood to aorta from loss of compensation. With this pre-systolic murmur there is generally a systolic murmur from regurgitation, even sometimes masking the real murmur. Death may be sudden from mitral stenosis, fibrin accumulated (lesions).

MITRAL REGURGITATION is very common from insufficiency of valves—is mainly of rheumatic origin.

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PHYSICAL SIGNS.—A murmur, systolic, heard loudest at apex, transmitted backwards, even to lower angle of scapula. May be heard all over heart. A thrill, systolic, at apex is sometimes present.

CONSEQUENCES are pulmonary engorgement, accentuation of pulmonary valves, reduplication of second sounds. Pulse regular and small if compensation is good, but irregular in volume, rhythm and force if there be less of compensation. Dilatation of left auricle. Dilatation somewhat of left ventricle, for it has to hold enough blood for systemic circulation and regurgitation. Pulmonary congestion. Dilatation of heart, regurgitation, venous stagnation, dropsy.

EFFECTS.—As long as compensation of left ventricle and right heart are good there are no evils, but on loss of compensation symptoms develop. Loss of compensation may be from dilatation, fatty degeneration, etc. Dyspnoea is a symptom. This form of disease kills generally by dropsy, slowly, or by pulmonary congestion, active or gradual, or hemorrhage from lungs (aortic disease kills suddenly). A murmur at left apex may not be due to mitral regurgitation, may be from roughening of ventricular surface of mitral valves, or vegetations on edges of valves not hindering closure. Perhaps also choreic disturbance of papillary muscles. These mitral murmurs are often high and musical, are heard loudest over ventricle itself, are not transmitted around chest, are not attended by alterations in heart, there is no incompetence. Another murmur from curable mitral regurgitation, caused by adanæmia, heart's muscle weakened, so base does not contract to narrow valves orifice. Is met with in anæmia in all febrile diseases, from this impaired nutrition. These murmurs disappear with returning strength. Is often heard about 3rd rib at base of heart.

TRICUSPID REGURGITATION is fairly common, murmur systolic, is usually soft, low-pitched, heard in lower sternal region, especially along the border. It will be feeble over the base, will be transmitted a little to the right. Is too feeble for a thrill, is in many cases marked by mitral regurgitation as primary cause. If the right ventricle be strong you will have accentuation of second sound, not otherwise. Indirect signs,—fullness of jugular veins, and after a time visible pulsation. A double pulsation from auricular and vent. contractions, pulsation of liver may be also noticed even before the jugulars pulsate, pulmonary oedema, right heart auricle and vent. dilated. Pulse not affected if the left heart is all right, venous stagnation with its consequences, general dropsy. In marked dropsy you have tricuspid regurgitation.

CAUSES.—Not usually inflammation; acute endocarditis does not attack these valves, but chronic endocarditis is set up if the right heart is habitually strained. Habitual strain so affects the valves, walls, arteries, etc. Exceptionally is attacked by rheumatism. Obstruction in the left ventricle is the 2nd great cause. 3rd, obstruction of pulmonary circulation, asthma, emphysema, cirrhosis, acute bronchitis; 4th, adanæmia also, weakness of the heart's muscle. Tricuspid regurgitation is often curable when disease causing it is removable, not so if from disease of the left heart.

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TRICUSPID STENOSIS.—Narrowing of this orifice never occurs alone without mitral disease, and in 50 per cent. of disease of the aortic valves. So it cannot be diagnosed from mitral stenosis unless by great skill. Its clinical history is part of mitral valve disease.

CONSEQUENCE OF MITRAL VALVE DISEASE.—Reduced pulmonary circulation, whose signs are breathlessness on slight exertion, liability to bronchitis or pneumonia from slight causes, infarctions of lung, hence hemorrhage or pneumonia. Splenization of lung, local gangrene from infarcts rare, pulmonary emboli from the right heart to lungs, or there may be profuse hæmoptysis from extreme congestion. In long standing cases brown induration of the lung and cirrhosis—by and by the right heart is affected—venous congestion, hence the brain is affected—flashes of light, faint spells, noises in the ears, sleep disturbed by dreams, sense of falling, pseudo-apoplexy, syncope, etc. Enlargement, cirrhosis, and likely hypertrophy of the liver, and jaundice. Stomach—flatulency, weak digestion, vomiting of blood from liver or stomach, catarrh of mucous membrane of the stomach. Intestines—catarrh, diarrhoea, alternating with constipation. Kidneys—urine diminished, one of the first symptoms of failure of compensation, scanty and high colored, kidney becomes cyanotic and indurated. Vascular system—liability to hemorrhages or dropsy, last beginning in feet, symmetrical; passive congestion is also alternative with dropsy or hemorrhage.

HYPERTROPHY means increase in muscle of the heart, overgrowth; average weight of the heart 9 oz., heavier with age, female 1 oz. lighter. Cause of hypertrophy is overwork. It may be general, all parts of the heart affected, dilated; or may be partial, as of one cavity.

CAUSES OF OVERWORK.—1. May be heart itself, functional excitement in nervous persons, tea drinkers, tobacco and alcohol users, also prolonged muscular efforts. A chronic pericarditis by its irritating stimulation, dilatation of the heart, causing more work, hence compensative, Grave's disease, also palpitation of anæmia. 2. Disease may be from valves, as already treated by causing the work to be done at a disadvantage. 3. It may originate in the arteries, as chronic endoarteritis, aneurisms, congenital contraction of the aorta. 4. In capillaries as in disease of the lungs for the right heart. Chronic Bright's Disease, pregnancy, muscular efforts, arterio-capillary fibrosis.

PHYSICAL SIGNS OF HYPERTROPHY.—On inspection of the chest, prominence of precordial region is often seen. The pulsatile area is increased, increased force of the beat, which feels to the hand as though it had weight, apex beat displaced downwards and outwards if left ventricle, is in the epigastrium if right heart. Percussion finds increased area of dullness, auscultation finds heart sounds increased, there may be no dilatation, there may be accentuation of 2nd sound, even reduplication if right heart is not hypertrophied.

CONSTITUTIONAL SYMPTOMS.—Hypertrophy is nature's cure of obstruction. In simple hypertrophy the walls are thickened, the cavity not enlarged, but in eccentric hypertrophy there is enlargement of the cavity. In the simple form

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there may be no inconvenience unless palpitation during exertion, in eccentric form you may get no inconvenience, patient may have sense of fullness, headache, perhaps painful attacks of palpitation during exertion. So long as the heart empties itself, symptoms are nil, but when the heart is not emptied then you get grave symptoms; as long as compensation keeps up, of course arterial tension is high, hence flushing, as when stooping, hence rupture of artery, apoplexy, etc. An artery must be diseased to rupture, pulse of course strong. In old vessels carotids will be throbbing, shortness of the breath sometimes, for a large heart encroaches on the lungs. A murmur up and down the sternum is aortic, *i. e.*, if heard loudest there. A murmur loudest at the apex of mitral—if with systole it is regurgitant, if pre-systolic it is obstructive, if loudest in the tricuspid area it is tricuspid.

DILATATION means increased capacity of the cavities of the heart—whatever tends to obstruct tends to dilate. If the heart be well nourished hypertrophy predominates, otherwise dilatation predominates. In order that the heart may dilate it must be degenerating or nutrition impaired. Granular or fibroid degeneration are those chiefly concerned. When heart dilates rapidly in fever the change in the cells is not well understood. Mechanism of dilatation is over-distention, as from regurgitation, or heart receiving too much blood from too vigorous an auricle, or its own weakness, or inability to completely empty itself, or stenosis, etc. Dilatation may be from malnutrition of the heart's muscle, in anæmia, different specific fevers, wasting disease, etc.

PHYSICAL SIGNS.—There is no prominence of the precordium unless hypertrophied. 1. Pulsation diffuse and feeble, no true apex beat, or no pulsation may be found at all. 2. Palpation finds the heart's impulse weak, and the finger cannot find the apex beat, heart is rounded, apex diffused. 3. Percussion finds increased cardiac dullness, vertically and transversely. 4. Auscultation finds weak sounds, but if there be accompanying hypertrophy, sounds may be loud; usually you will find a murmur, for general valvular disease caused the dilatation, or the dilatation widens the orifices.

SYMPTOMS OF DILATATION.—Dilatation is equivalent to obstruction, thus a dilated right ventricle must lead to pulmonary congestion. If the left ventricle be dilated you get a weak arterial circulation, so dilatation brings about congestion of all the organs, the very same symptoms as mitral regurgitation. If the left ventricle is dilated, pulse is soft and regular, but in extreme cases it is irregular in rhythm and force. Heart will palpitate on slight exertion, and distress will be felt in the heart up to angina. Such persons are weak all over, mentally and bodily, are apt to be irritable, melancholy, have bad dreams, awake from a sleep in alarm. In sleep the blood is less oxygenated, and they feel suffocating.

TREATMENT OF VALVULAR DISEASE.—As long as compensation is complete patient suffers none, physician lays down rules only for mode of life, diet, exercise, etc. The detection of a murmur does not always demand medicine. You must first have signs of loss of compensation. Do not alarm your patient by

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telling him of heart disease, do not blurt out to a patient on discovering any serious disease.

CAUSES OF CARDIAC FAILURE.—1. Any serious intercurrent disease, especially acute rheumatism or bronchitis, asthma, pneumonia or acute fever. This failure may be only temporary, and judicious treatment may save patient. Use of stimulants, rest during convalescence. 2. Over-exertion from daily fatiguing labor or more sudden strains at athletic exercise, or blowing in wind instruments. The poor especially suffer from this cause. 3. The nutrition of muscular tissue of heart may be impaired from poor blood, as in anæmia, hemorrhages, leucorrhœa, chronic diarrhœa, want of proper food, or dyspepsia, causing gradual cardiac failure. If a dyspeptic has a murmur, etc., first cure the trouble, and the heart will often cure itself. 4. Mental worry, grief, exhaustive study, emotions are common causes. Give up your work for 6 months. 5. The gradual shortening of the valves of muscular tendonous attachments, from cicatricial contractions of former inflammatory exudation; hence gradually increasing incompetence which is permanent and not recoverable from. 6. Tea, coffee, tobacco, alcohol may act as poisons to some, causing palpitation, etc. With alcohol you have to combat the habit very hard. Alcohol sometimes causes acute palpitation, curable by stopping the habit, and nourishing food. 7. Pregnancy is also a cause, exhaustion from confinement. 8. Rupture of a valve will produce cardiac failure. Once compensation ceases you have cardiac failure. 9. Disease of the coronary artery is also cause of heart failure. Syphilis causes this, and the degeneration is either fatty or fibroid, and leads to cardiac failure. It is amenable to treatment. If from atheroma it is not. 10. Gout is a common cause from atheromatous arteries and fatty heart. 11. Indolence, sedentary habits, rich food, wines, etc., induce fatty degeneration of the heart, etc. You can prevent disease from advancing by living on one shilling a day, and earning it. 12. Constant valvular tension from valvular disease brings about a low valvulitis, hence fibroid degeneration of valves, cicatricial contraction, incompetence, not remediable.

CONCERNING DIET.—Food should be easily digested, plain and well cooked. Avoid soups, for the blood should be concentrated, animal food in excess, tea, coffee and tobacco prohibited. Alcohol as a rule should not be in the diet. If digestion be bad, vital powers low, no appetite, dilatation great, alcohol may be given; vegetable bitters, mineral acids, pancreatize, etc., are useful for weak digestion.

EXERCISE regulated according to the nature of lesion and the extent of failure of compensation, for example, in mitral valve disease if dyspnoea be present much exercise is bad. In aortic disease, stenosis, exercise is generally well borne even in regurgitation till compensation fails. Mountain climbing has been recommended for some forms of cardiac disease. It promotes the respiratory functions and excites the cardiac muscle. But "Urtel" does not prescribe mountain climbing in severe valvular disease. Pulse irregular and feet oedematous.

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He does send gouty, fatty hearts to climb mountains, also cases of corpulent people, fatty accumulation about the heart. Before sending he reduces the fluid in the blood by diaphoretics, and gives an almost animal diet and little drink. Foregoing treatment is not yet fully tested. Rule is if compensation is failing give that heart rest; if only beginning, and arising from want of exercise, give exercise.

MEDICINAL TREATMENT OF PALPITATION.—Cardiac sedatives, Prussic Acid, Bromides, Belladonna, Digitalis, Stropanthus, Spartein, Caffeine, Convallaria, also Arsenic, Iron and Quinine occasionally, indirectly. For cardiac pain and nervousness give Arsenic, Amyl Nitrite (m. 5 inhaled), or a solution of Nitro-Glycerine m. 1, 2 to 3, four times daily, increasing to 28 m. per day for Angina. Chloral with some is favored, feared by others. Fowler's Solution m. 5 T. I. D. for cardiac pain and nervousness.

CARDIAC DROPSY.—Begins as a rule in the feet, extending up, sometimes does begin in abdomen, sooner or later involves all the serous sacs.

TREATMENT OF DROPSY.—Patient generally keeps to bed, diuretics are used. Digitalis is best, is a vascular diuretic. To get full effect give full doses. Give from $\frac{1}{2}$ to 1 oz. of the infusion, or m. 10, 20 to 30 of the Tinct. every 4 hours, or even every 2 hours. Give it a good trial. You do not get the effects for 2 to 3 days. Do not over-use the drug. If pulse slowed, urine lessened, vomiting, headache, suspend its use. The Tincture is the most certain preparation. Digitalis is seldom given alone, give with Pot. Acet. and sweet Spts. of Ether. If a little Squills be added often you get effects, when not from Digitalis alone. Or give Digitalis and Quinine equal parts, Squills 2 parts in pill if heart be weak. If Digitalis fails give Stropanthus; old Tr. is 1 in 8, new Tr. 1 in 20. Give m. 5 to 10. It acts quicker than Digitalis, does not cause arteriole contraction. Spartein is another drug, begin with gr. $\frac{1}{2}$ T. I. D., pushing up to 3 to 4 grs. per day. Calomel given alone gr. 2 T. I. D., watching gums, will sometimes succeed when other agents will not. Do not give in albuminuria. Hydragogues 2 to 3 per week, as Pulv. Jalap Co. or Resin of Scammony and Cream Tartar, or Elaterium gr. $\frac{1}{4}$ th every 4 hours. If dropsy does not yield aspirate abdomen and then sometimes Digitalis will act. Instead of tapping the abdomen puncture of legs and scrotum with 3 connected needles is done, wash skin with an antiseptic. Make 2 to 3 punctures on the inner side of the leg and apply an antiseptic bandage over these points. Bandage prevents occurrence of local inflammation. Patient may become weak from loss of water.

AORTIC REGURGITATION.—When compensation is failing, treatment is needed. Put to bed for a few days to lessen the weight of the blood on the valves. Give Digitalis judiciously. There is fear that slow diastole will allow of large filling of the ventricle, hence begin with m. 5 T. I. D., pushing if effects are needed; watch that the heart is not too much slowed, vomiting, etc., intermit its use, give 3 days, stop for 2 days the treatment, etc. It is accumulative medicine (not so Stewart). Convallaria (Lily of the valley) is also a good agent, but

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not equal to Digitalis. Senega and Hyoscyamus and Sweet Spirits Nitre T. I. D. is thought good in England. Iron is also indicated to sustain nutrition of the heart. Quinine, mineral acids. Diet should be generous, do not overload, though. Give Arsenic for accompanying angina. In some cases of large hearts with great palpitation, Aconite has been used with advantage.

MITRAL DISEASE.—Rest of heart is not so needed, but circulation may demand it, so as not to overload the lungs too much. Treat with Digitalis. It can be here used for month after month, but intermit every 7 to 8 days, so as not to get the system accustomed to drug, taking a substitute. Pulmonary congestion may call for dry cupping on back. Give an occasional purgative. Treat accompanying bronchitis on general principles.

XXXVI. DISEASES OF THE LIVER.

ASCITES is frequently part of a general dropsy, but often is separate and depends on obstruction of the portal circulation, or Bright's Disease, or cardiac obstruction, or more early pulmonary obstruction. Ascites—a skin full of wine.

SYMPTOMS OF ASCITES.—1. Gradual uniform enlargement of abdomen, and is general; 2. Fluctuation, wave transmitted through the cavity. No pain. Dyspnoea. 2. Percussion, patient on the back finds a clear note, in front, for intestines are floated, mark with clinical pencil, turn patient and clear sound changes, dullness where the fluid is. The weight of fluid on renal veins lessens the urine; on vena cava causes oedema of the legs, a late symptom. This passive congestion seldom leads to albuminuria. This ascites may be confounded in women with cystic disease of the ovaries. In early stage there is no difficulty, for the pain in tumor will be unilateral, menses may be deranged, but when the whole belly is distended by a large cyst it gives difficulty. In ascites the enlargement is perfectly symmetrical, in ovarian disease is rarely so. Skin glazed. Percussion in ovarian dropsy gives dullness in front, clear notes laterally from behind—change of posture does not alter a dullness with ovarian tumor. Palpation will find generally points of irregularity, resistances, hardness, etc. In ovarian tumor from smaller cysts, percussion also is not uniform. Breathing thoracic. Measurements from umbilicus to anter superior spina of ilium gives equal results in ascites but unequal results in tumor. Under an anæsthetic you can feel the fluctuations spherical. An arterial murmur can often be heard in ovarian tumor if it press on aorta. Occasionally a vaginal examination will clear it up. If you are in doubt, tap. Fluid of ascites is transparent, alkaline, thin, citron color, no flocculi. Fluid of cyst is viscid, glutinous, usually discolored. Its viscidness is due to par albumen which does not coagulate with acetic acid and heat. Microscope detects large granular bodies—Dr. Esadle's bodies (not fat). Other conditions may be confounded with ascites, as hydatid cysts, or an enormous cystic kidney. Pregnancy (?). Retention of urine, a flabby belly in a very fat woman, colloid disease of omentum (rare). Tumor, enlarged viscera.

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ASCITES is a symptom, not a disease ; is divided into : 1. Symptomatic when due to some other disease. 2. Idiopathic, no cause known. Cause exists though.

CAUSES—SYMPTOMATIC.—1. The one great cause is cirrhosis of liver, either hypertrophic or atrophic form. 2. Amyloid disease of liver. 3. Cancer of liver. Tumors, conerctions in bile duct. 4. Cancer affecting various parts, omentum, pancreas, general peritoneum. Colloid disease of same parts. 5. Enlarged ovary, above are common.

RARE CAUSES are (1) Perihepatitis, inflammation of capsule. (2) Thrombosis or cancerous obstruction of or adhesive inflammation obliterating the portal vein. (3) Obstruction of inf. vena cava just above hepatic vein's entrance. (4) Enlargement of kidney or spleen interfering with portal circulation. (5) Disease of mesenteric glands, as waxy, amyloid, cancerous or serofulvous.

XXXVII. CIRRHOSIS OF LIVER.

MORBID ANATOMY OF CIRRHOSIS OF LIVER, called chronic interstitial hepatitis, chiefly of larger sheaths of Glisson's capsule which surround portal vein and branches. An exudation of leucocytes gradually becomes converted into connective tissue (after going through process of fibroblasts, embryonic tissue into fibrous tissue). This fibrous tissue presses on hepatic cells leading to their atrophy, some undergo fatty degeneration. Liver is rendered firmer, less vascular, for fibrous tissue obliterates vessels. General constipation. Bile ducts are seldom affected, hence no jaundice, sometimes wasting of hepatic cells expose new bile ducts. This formation of fibrous tissue sometimes forms in vessels, walls also, narrowing them, thickening the walls. Capsule is thickened and often adherent to adjacent parts. These bands of adhesion may be so vascularized as to afford collateral circulation, and hence absence of dropsy. The liver is reduced in size in atrophied form, firm to touch, rough and granular (hob-nailed). Color varies—yellow, purple, light blue. Organ feels tough, dense, weighs less, edges may be puckered. On incision it resists the knife, and discovers fibrous bands, etc. Usually the hypertrophic form produces a smooth surface, the process being uniform. When process is induced from heart disease, then the pressure from veins leads to atrophy of centre of each lobule (nutmeg liver). At same time the fibrous tissue proliferates. When syphilis is the cause it often changes outside of organ, great irregularity, fissured, lobulated. Often in congenital syphilis you have atrophy with cirrhosis. If produced by perihepatitis the organ is fissured, strangled, fibrous bands extending inwards as septa, capsule greatly thickened. A rare form is from adhesive inflammation of inf. vena cava, hepatic vein obliterated. There is also a rare form, red atrophy or chronic atrophy, met with after malaria, etc. It is not granular, is of a uniform red brown color, cirrhotic, fibrous. Is deeply pigmented after malaria.

CLINICAL SYMPTOMS.—Set in usually insidiously, rarely actively and openly. Dull pain in right hypochondrium. In insidious form, indigestion, furred tongue, morning vomiting (drink), flatulency, constipation, and also a feeling about liver. In some cases actual pain about liver, and perhaps slight enlargement and slight fever. Gradually complexion becomes sallow and dry, loses appetite and loses

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flesh. These symptoms may last for a longer or shorter time. Then symptoms (second stage) of portal obstruction follow, as dilatation of veins on epigastrium and abdomen, especially on right side. Hæmorrhoids, bleeding, or vomiting of blood, slight to profuse, also ascites. These symptoms may alternate, hemorrhage relieving. In this stage blood is altered, bleeding more easy. Urine is scanty, high colored, and deposits a pink sediment. Severe indigestion, eructations, vomiting, diarrhoea, and death from exhaustion. Another mode of death is poisoning by biliary matter, "acolia." Its symptoms are slight jaundice, purpuric spots, delirium, convulsions, coma. Jaundice not often present though. Liver is greatly enlarged, but in atrophic form its dullness may almost disappear. There is corresponding enlargement of spleen when portal circulation is obstructed, and may even be indurated. Jaundice ensues only occasionally, comes on slowly, is seldom complete, nearly always bile in stools. It is a bad symptom. The association of jaundice with ascites means either cirrhosis or cancer of liver. Although fever is not constant, yet occasionally it is prominent even for weeks, principally in the hypertrophic form. Hypertrophic is a more active form than the atrophic, more fatty too. A symptom is a stellate group of veins on face near the eyelids. Occasionally cirrhosis is advanced, and no dropsy of the belly. In these latent cases the liver is usually large. Cirrhosis once begun usually proceeds to a fatal issue with no hindrance or arrest. Occasionally there is an arrest, as when only part of organ was affected. 1, There are cases in which the arrest is insidious, this class comprises the great majority of cases; 2, those cases with more or less rapid arrest.

CAUSES.—1, Great cause is use of raw spirits in excess or on empty stomach, even seen in children; 2, syphilis is also a cause. It may produce well-marked hypertrophic cirrhosis, (2) or atrophic cirrhosis, (3) more frequently a lobulated liver, (4) and may deposit gummata with local spots of atrophy; 3, products of faulty digestion entering the blood, and also the use of stimulating food, highly spiced, especially if too little exercise be taken. Soptomaines act, even peptones at times acquire irritating properties; 4, due to venous obstruction, cardiac disease; 5, some think ague may cause it; 6, biliary cirrhosis from obstruction of bile ducts, the proliferation beginning in the fibrous tissue, thence extending as an interstitial hepatitis, etc.; 7, specific poisons, as of typhoid, cholera, typhus, measles and scarlet fever; 8, it is not infrequently associated with tuberculous disease; 9, a chronic peritonitis starting a perihepatitis may so start a cirrhosis; 10, obstruction of portal vein,—rare. Prognosis bad. Fatal in one year from positive diagnosis in most cases. Rarely it is arrested.

TREATMENT.—1. If you suspect it, and patient is a drinker, make him a teetotaler,—imperative. 2. Alter his diet, plain unstimulating, farinaceous food in excess. 3. Insist on daily exercise. 4. If there be tenderness or fullness of liver, or pain, leech over liver, or at anus, and drain portal system, and also give saline purgatives, or give a mercurial, and follow by a saline next morning. If you give mineral waters give in a.m., fasting, instead of saline. Mercurial treatment is

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again becoming prominent. Give small doses Calomel gr. 1 to 2 T. I. D. Arrest may ensue, keep up for 5 to 6 weeks, avoiding pytalism—some prefer the Hg. Cl₂ in small doses, gr. 1 to 16 T. 1. (4th). Give Mercury in early stages. R. Hyd. Bichlor. gr. 1/4th, Am. Mur. gr. 15, Tr. Cinchon. m. 10 T. I. D. If you are afraid of Mercury give Pot. Iod. and Am. Chlor., giving in Taraxicum and Gelatine. Some give m. 10 Ac. Nitro Mur. T. I. D., give with a bitter, Taraxicum and Gelatine. Martineau continues alteratives for several months. When disease has advanced, dropsy present, then cure is out of the question, and as a rule all these remedies fail. Yet try a mercurial, if it fail then watch stomach, some give a milk diet, some give ox gall in place of proper bile. Some (Loomis) give 10 Morrhu as an alterative. Bowels kept regular by mild laxatives, sulphur or gall, aloes, etc. Give bitter tonics with Rhubarb, as Quassia, etc. Nux. om. is especially good.

RE DROPSY.—Diuretics generally fail, try Blue Pill, Squills and Digitalis, do not salivate. The resin of Copaiba sometimes acts, give gr. 15 T. I. D., or Caffeine gr. 5 to 10. Diaphoretics, Pilocarpine, hot baths sometimes act. Tapping is only sure way, use aspirator rather than trocar. Draw off slowly, gradually. Southey's tubes are also used. In advanced cases, patient losing strength, etc. avoid severe depletive treatment, but rather tap to relieve dropsy. Comparatively early and frequent tapping gives greatest relief, prolongs life and gives best chances for recovery.

XXXVIII.—BILIARY CIRRHOSIS OR HEPATITIS.

Is more or less acute, bile ducts are permanently obstructed. The pent up bile causes irritation, hence chronic interstitial hepatitis may be caused by tumor or cancer, stone in duct. 1. There is early and persistent jaundice, gradually increasing. 2. Enlargement of liver, hypertrophic. 3. Liver sometimes remains normal in size, or atrophies, and sometimes is very atrophic. 4. There is usually absence of ascites, etc., for there is no portal obstruction. 5. Usually fever and pain (hepatitis). 6. Epistaxis may occur from damaged blood, but there are no severe hemorrhages as in ordinary cirrhosis. 7. It usually lasts 2 to 3 years till liver is unable to perform its functions, ending in delirium, convulsions, coma, icterus gravis. Hepatitis may be divided into deep-seated suppurative form and the superficial adhesive form.

TREATMENT.—Is of jaundice from obstruction. (See folio 161.) In idiopathic form, treat like ordinary cirrhosis. Circumscribed deep-seated disease of liver is either traumatic or pyæmic. If traumatic (a rare cause) symptoms are chill, local symptoms as pain and weight over liver, a sensation of fullness in hepatic region on inspiration. If inflammation be general you get some hepatic enlargement, but not much. Defective movement of hypochondrium on breathing with no lung disease to account for it. There is mild inflammation, fever with its symptoms. Occasionally there is vomiting, especially if lower surface of left lobe of liver be involved. There may be slight jaundice, sometimes urine has a trace of bile. Patient lies on back, and if he lies on left complains of pain

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of heavy liver. If peritonæum be involved there is pain on breathing. Such symptoms following blow on right side, and no pneumonia or pleurisy gives you diagnosis of hepatitis (deep-seated). You infer that suppuration has occurred when foregoing local symptoms abate, the pyrexia abates and rigors occur following fever and profuse sweating and intermission of fever. In these intervals there is pain in right shoulder, pain over liver, rigidity of right rectus muscle, a short dry cough, jaundice occasionally, enlargement of liver either up or down. If it be secondary to pyæmia, is from operations, dysentery, etc. General symptoms are not reliable, you infer hepatitis by pain in right hypochondrium and fullness there and increase in dullness, perhaps slight jaundice. But three principal symptoms of hepatitis may be absent—as pain, for parenchyma of organ is not very sensitive; jaundice, for only a part of organ may be involved, the rest doing the hepatic work; enlargement of liver. Even the general symptoms may have been absent. Yet if symptoms of hectic occur in fallow individual who has had bilious attacks, etc., you may suspect hepatitis. If abscess open into peritonæum there will be death from general peritonitis, unless circumscribed. It may burst into stomach, and be vomited, or into thorax and pus discharged into diaphragm, inciting local pleurisy, later perforating lung and being expectorated, give physical signs of abscess of lung, etc., or it may perforate externally. Discharge of abscess lessens hepatic tumor, and in rare cases spontaneous recovery has occurred. Differences between pyæmic and tropical abscess of liver—pyæmic form occurs in temperate as well as in tropical climates, the other is always tropical. In pyæmic you have source of pyæmia, as in injuries, ulcerations, surgical operations, etc. The causes of tropical are cold, malaria, irritating congestion, etc. In pyæmic form there will be more than one abscess formed, only one in tropical form. There is not much enlargement of liver in pyæmic form, there is in tropical form, and especially in one direction, and such projection is fluctuating. In pyæmic, pain and tenderness are early and acute, are also present in tropical, but not as acute, dull, only becoming severe when surface of organ is reached. In pyæmic, jaundice is present from blood causes, not obstructive, and spleen is enlarged; in tropical form there is no jaundice usually, or, if so, is not obstructive, and spleen is not enlarged. In pyæmic, course is 3 to 8 weeks, in tropical form may last six months, may become quiescent. In pyæmic form prognosis is bad, fatal, while in tropical form is much better.

TREATMENT of circumscribed hepatitis (tropical form). In early stages before exudation and loss of strength, patient robust and symptoms acute, resort to venesection, but local bleeding is more suitable in majority of cases, as bleeding right hypochondrium; some leech the anus. Follow by hot fomentations and poultices, and give a mercurial purge, as Calomel gr. 10. Tarax, and Sod. Bicarb. is also recommended. Absolute rest in bed and restricted diet are to be insisted on, persevering for several days after subsidence of symptoms; later, blisters over liver are useful, in many cases are thus arrested before stage of abscess, but if stage of suppuration occurs, as in pyæmia and abscess stage of tropical form, then

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give stimulating treatment, broths, wine and tonics, as *Ae. Nit. Mur.*, etc. If abscess points externally, it must be opened. Amyloid disease is painless, spleen enlarged, albuminuria and history of bone disease, suppuration or syphilis. Cirrhosis—liver may be large, nodular and tender. There may be jaundice and ascites, but alcoholic history, alcoholic dyspepsia and physiognomy, emaciation is not so rapid or great. Syphilis produces interstitial hepatitis, or nodular waxy liver, with jaundice, tenderness, ascites; history and age may lead to diagnosis. Catarrhal jaundice if chronic has only little enlargement. Gall stones, paroxysmal pain, no ascites, little hydatid enlargement—may be impossible to diagnose from cancer.

XXXIX. LARDACEOUS DISEASE.

Or waxy, bacony liver (or scrofulous). Gross view of amyloid liver is, liver is slowly and uniformly enlarged, heavy and dense, anæmic, of a pale grey color. Making slices they are translucent, bacony, but this varies, will weigh 7 to 11 lbs. The disease begins in intra-lobular arteries, these become thickened, hyaline, lumen narrowed. Hepatic cells resist, but finally atrophy from pressure, or become fatty or amyloid. *Tr. Iodine* gives mahogany brown. *Methyl violet* a rose red. This material is albuminoid, not starchy, no fluid in blood gives this reaction, so there must be something in tissues, which acting with serous blood produces this deposit.

CLINICAL SYMPTOMS.—Disease is painless, insidious. There may be a sense of fullness when liver gets large. No pain unless in syphilitic form, perihepatitis. Jaundice does not occur unless glands in tissue of liver become amyloid, and press on bile ducts. Of course a concurrent jaundice from a biliary catarrh, etc., may be present. Ascites is not abundant, comes on slowly and late, sometimes not at all; but if enlarged glands under liver press on portal vein you may get ascites. A low form of peritonitis may also cause it. Obstinate vomiting with a clean tongue owing to amyloid disease of m. membrane of stomach, also from amyloid deg. of villi of intestines causes obstinate diarrhoea. Sugar has been found in peritoneal effusion. Complexion pale, for blood is impoverished, white cells in excess, deficiency of red cells, liver slowly and uniformly enlarges, and with it of en the spleen and also often the kidney, hence albuminuria and amyloid casts. Enlarged liver and spleen and albuminuria would prove amyloid deg. Cervical glands may also be enlarged. There is a marked tendency to phlebitis, thrombosis forming. It may occur at any age, and its causes are two—chronic suppuration and constitutional syphilis. For suppuration, caries of bones, as hip, vertebrae, scrofulous diseases as phthisis, suppurating cervical glands, abscesses, empyema, etc. Rare causes, as chronic albuminuria, chronic dysentery, large growths, malignant leucemia. In some cases no cause can be found. As a rule, once developed, this disease progresses; occasionally there is an arrest, especially if of syphilitic origin, rare if from suppuration.

TREATMENT.—Try and prevent by curing abscesses, excising joints, tap empyema. If disease be far advanced in knee, etc., perhaps amputate. Try *Pot. Iod.* or *Tr. Iod.* or *Am. Mur.* gr. 10 to 15 *T. I. D.* for a long time seems good.

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DIRECT TREATMENT.—If syphilitic, treat it—as Pot. Iod. gr. 5 to 10 for months. A course of Nitric Acid has cured. Iron is called for in all cases. Generous diet, baths, especially the sulphur bath. In all forms you can try potash to supply potash lost to system by suppuration.

XI. CANCER OF LIVER.

MALIGNANT DISEASE.—The several forms of cancer occur—encephaloid usually, sometimes scirrhus. Of all the organs liver oftenest has melanotic cancer. Primary cancer of liver is rare ; is secondary to cancer in neighborhood. Colloid disease (cancer) is never a primary disease of liver, rarely secondary invasion.

CLINICAL FACTS.—In many cases an early symptom is an emaciation without cause, usually attended by loss of strength, disordered digestion, nausea, vomiting, loss of appetite, diarrhoea. More frequently slowly—the wan sallow look of malignant disease is seen on face, anemic, an expression of melancholy. 1, Enlargement of liver usually, either upward or downward, may be rapid, signifying cancer ; and 2, is apt to be nodular, except in rare infiltrated variety. This enlarged organ is painful to touch, and examination makes it more painful. **Diagnosis** :—Nodules have extended gall bladder, lumps of feces in colon, deep fissure from tight lacing, etc. There is more or less constant pain. Pain increases with rapidity of growth and occurrence of localized perihepatitis, often secondary to other cancer, hence look for cancer elsewhere. Jaundice is not necessary but is common, as when a cancerous nodule presses bile duct, or when glands in fissure are cancerous and press on bile duct. When jaundice occurs it is persistent. Ascites is not necessary, but is common, late, caused by a low form of peritonitis from cancer, or from pressure of cancerous nodule on portal vein. No enlargement of spleen as in cirrhosis or amyloid. Wherever you have ascites and jaundice look for cancer and cirrhosis. Age helps. Cancer usually sets in after 35 to 40 ; exclude syphilis, malaria, cirrhosis. A valuable fact is, spleen does not enlarge as it does in cirrhosis. Urine is rich in uric acid, poor in urea. In melanotic cancer urine after 12 hours' standing gets dark. In last stage blood altered—you often get hemorrhages, by vomiting, stool, etc. Duration is short, 2 years for hard form, 1 year for soft kind. Constitutional symptoms are emaciation and digestive derangement, diagnose from cirrhosis, syphilitic and amyloid, biliary cirrhosis, etc.

TREATMENT, merely palliative—for pain, Opium and rest ; for ascites, tap.

XII. JAUNDICE.

2 forms : 1, obstructive ; 2, non-obstructive or icterus. Is a symptom of many diseases, and in other cases is a disease of itself. It is a yellowness of the skin and conjunctive and of the secretions, due to circulation in body of bile pigment. It arises sometimes from passage of bile into blood by reabsorption, and the great cause here is (A) obstruction of bile ducts (mechanical jaundice), anything which interferes with (B) full play of diaphragm may do it, as right pleurisy, pneumonia, etc. It may also arise from (C) diminished tension in portal system favoring absorption, as in yellow fever, or by coagula in large portal

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branches; (D) the presence of excess of pigment in the portal veins favors it; (E) polycholia, excessive secretion of bile also favors it. 2. Deficient oxidation of bile in the blood, (chemical jaundice), but we have no proof that bile gets into the blood in health, is not accepted. 3. That the bile pigment is really formed in the blood, or that the coloring matter of the blood is convertible into bile pigment. So this would be hemorrhagenous jaundice. 4. The suppression of the functions of liver, and so the accumulation in blood of bile, etc. This theory is false, for liver only makes the bile, not the blood. Jaundice is met—1st group obstructive. 1. In obstruction to outflow of bile, mechanical form. Conditions for above— 2, obstruction may be (A) in the tubes, as catarrh of tubes or a duodenitis, affecting orifice; 3, also gall stones, cancer pressing on duct; 4, spasm of ducts if continued. Hydatids, flukes, round worms from duodenum, rarely a cherry stone, suppurating of hydatid cyst ulcerating into and obstructing a duct. (B) Outside causes acting on duct, as pregnancy, anaemia, loaded colon, biliary cirrhosis, abdominal tumors, especially if malignant in neighborhood, as of duodenum, pylorus, pancreas, etc., scrofulous hydatids and amyloid enlargement of glands, even ovarian or renal tumors. Even an abscess of liver, as of head of pancreas. Bridles from adjacent organs. Perihepatitis by thickening capsule, also of pylophlebitis, or peri-pylophlebitis. Sometimes fatty infiltration of liver, congenital deficiency of bile ducts. In 2nd group, jaundice is non-obstructive. Some call it haematogenous, due to destruction of coloring matter of blood. 1. Fevers, especially yellow fever, malaria, relapsing, sometimes eruptive fevers (typhus, typhoid, scarlatina), sometimes jaundice is epidemic. 2. Acute yellow atrophy of liver, pernicious anaemia, paroxysmal haemoglobinuria, internal hemorrhages (haemic causes). 3. Toxic causes, as Phosphorus, Arsenic, Lead, Copper, Mercury, Opium, Chloroform, Ether, K. Clo., certain mushrooms, bites of certain snakes and fish. 4. Disease following innervation, as after fright, powerful emotions, perhaps this excites spasm of duct or produces polycholia, icterus, neonatorum.

SYMPTOMS from obstruction. When flow of bile is prevented, liver is the first to be colored, then the blood, serum is tinged yellow, third is the urine in 2 days, then other secretions (perspiration), and lastly skin, mucous membranes and conjunctiva in 2 to 3 days. All these may occur in 24 hours, but 2 to 3 days is ordinary. Secretions of mucous surfaces are not stained by bile, unless albuminous material be present, as in sputum of pneumonia, or secretion of mammae, milk. Much bile escapes by sweat glands. Other symptoms arise from lack of bile in bowels and presence in blood. The bile neutralizes acid chyme, pp's the albuminoids, etc. It is an antiseptic hindering fermentation. It is a natural purgative, also emulsifies fat. So patient loses flesh, and stools shew 58 to 75 per cent. of fat. Stools slate color, putty like. On account of want of antiseptics you get flatulence and fetor of stools. Starches not affected. In rare cases there is diarrhoea from acidity of bowels, wanting alkaline bile, hence irritating. The presence of bile in the blood causes next group symptoms. Pulse is slowed 50 to 60, ditto respiration. Fagge thought that slowing of pulse always indicated catarrhal jaundice. Temperature often lowered, often unaffected. The

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bile acids and bilirubin are poisons; gr. $\frac{5}{7}$ bilirubin will destroy 35 ozs. of any animal—ten times stronger than the bile acids. Hence also as well as slowing of pulse and respiration and lowering of temperature, languor, headache, peevishness, sadness, giddiness and in some cases toxic symptoms, delirium, lethargy, convulsions, coma and hemorrhages. Itchiness of skin is in 20 per cent. of all cases, due to elimination of bile by skin, but the itchiness is not proportionate to depth of jaundice. The mode in which patient is preserved from toxic influences is that the pigment is *ppd* in tissues or eliminated by the kidneys. But overworked kidneys may be inflamed or stuffed with pigment, hence suppression of urine and uræmia. Death may be from uræmia, but excess of bile may kill from cholaemia. The bile acids in blood produce atrophy of hepatic cells, fatty degeneration of heart muscle, renal cells, even blood cells, all poisoned fatty degeneration. Therapeutics—when hepatic cells are destroyed no more bile is formed, but its ingredients are retained in the blood, and poison. This is alcoholia. And since liver forms urea we have its ingredients retained. These conditions form *icterus gravis*. The liver also manufactures glycogen, this function is lost, hence balance of nutrition is disturbed. In jaundice there is intense itchiness of the skin, is a good sign of obstructive form. Its four symptoms are: Slowing of pulse and respiration, lowering of temperature and itchiness. Sometimes there is yellow vision, urticaria may also be noticed (boils), sometimes little growths are found at inner or outer canthus of eyes. A chronic systolic murmur at apex is often heard, *adynamic*.

VARIETIES.—Catarrhal jaundice—*icterus simple* of duodenum or bile ducts, or both. It is common. Causes are: 1. It is preceded by catarrh of stomach or duodenitis, but there may be a primary biliary catarrh, *i. e.*, of bile ducts. Whatever causes gastric or duodenal catarrh causes catarrh of bile ducts. In children rich food (Xmas time) often causes gastric catarrh. 2. The catarrh may arise in liver itself, as is pyæmia and phosphorus poisoning, also in gout. A French author says change or increase in ptomaines in bowel absorbed affect liver by irritating, causing catarrh, but in these cases you would get graver constitutional symptoms, as fever, swollen spleen, albuminuria, etc. It is probable emotional causes thus act by producing alkaloidal poisons in intestines.

EPIDEMIC FORM.—Catarrhal jaundice sometimes prevails epidemically,—perhaps from cold and damp, perhaps from some infectious principle inhaled. Again, it is often found in connection with specific fevers: 1. The specific germ may act directly on coloring matter of blood; 2, or on bile ducts themselves; 3, or by causing production of intestinal peptones, poisonous,—above may be called infectious causes. Gall stones in ducts will also cause catarrh, ditto secondary syphilis, ditto obstruction of hepatic veins.

SYMPTOMS may be latent, only yellow skin and urine and white stools. Rarely at outset you have symptoms of duodenal catarrh (nausea, vomiting, loss of appetite, pain in epigastrium), some fever. Usually the *icterus* is preceded by symptoms of gastric disturbance, hence anorexia, furred tongue, etc. As a

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rule biliary catarrh does not give much pain in epigastrium or over liver, unless case is advanced, then pain along margin of ribs over liver, then liver may even be enlarged. If the inflammation involves lower end of the duct, as from duodenitis, etc., then escape of bile is prevented, hence enlargement of the gall bladder. Pain would be referred to duodenum. If obstruction be from cancer or gall stone then great distention of gall bladder.

RE INFECTIOUS VARIETIES.—This form is accompanied by fever, also by soreness and muscular pains, by sleeplessness, eruptions of herpes, swollen spleen, occasionally nephritis, hence albuminuria, these preceding jaundice 4 to 5 days. This icterus may be slight and even transient, may be severe. After a time in all cases involvement of other organs follows, as spleen, kidneys and sometimes lungs. In jaundice from obstruction, when bile flow is restored, there is a sudden increase in urine and urea.

DURATION OF CATARRHAL JAUNDICE.—Usually runs favorable course in 3 to 6 weeks. Those from fevers are affected by them. Rarely ends in icterus gravis and death.

COMPLICATIONS (catarrhal jaundice).—1. Occlusion by adhesion of lacerated m. memb. of cystic duct, hence dropsy of gall bladder or its obliteration. 2. Occlusion of individual ducts in liver, no symptoms. 3. Occlusion of common duct, very rare, hence biliary cirrhosis, atrophy of hepatic cells, etc., and terminate in year as icterus gravis. 4. Now and then gall stones form from arrested secretions, sometimes the, 5, catarrhal ducts suppurate, ulcerate.

JAUNDICE FROM GALL STONES.—Col. Lithiasis may arise as above, or from thick, gravelly material inspissated in the ducts.

CLINICAL HISTORY.—May occur in persons of inactive habits, corpulent, consumers of rich food, starch, sugar, etc., in malarial districts, in subjects of biliary catarrh (hence stones from arrested secretions). Is much more common in women as 3 to 2, in age generally 35 to 45, rare under 30. These stones are attended by intervals and attacks of jaundice, preceded by symptoms of biliary colic. These symptoms are, agonizing pain in epigastrium and right hypochondrium after a meal, urgent and persistent vomiting, sometimes severe rigors, reflexes, no febrile symptoms, as disease is mechanical. When stone reaches duodenum or slips back into gall bladder there is instantaneous relief. If during this attack jaundice appears in 24 to 72 hours it is proof of gall stones being cause. Occasionally stone causes hemorrhage. In spite of there usually being agony, often there is no pain, no symptoms. If effusion continues from obstruction of common duct, or if stone causes complete obstruction, liver gradually enlarges uniformly, and the gall bladder will be distended with $\frac{1}{2}$ to 7 pints of dropsical fluid, hence a tumor, oval, in site of gall bladder—perhaps handling will give a pseudo-crepitus from friction of contained calculi. Jaundice continues, there may be intermittent fever, sometimes periodical, oftener not, like ague attacks, rigors, fever, etc. These attacks of hepatic intermittent fever (of Chareot) may precede or accompany hepatic colic, or the last colic may be absent

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In latter case the obstruction is in ducts, in the liver itself, hence not removable, and no icterus in latter case. This hepatic ague runs irregular course, lasts 3 to 3 months with intervals between attacks of 1, 3 to 8 days, sometimes jumping with each case. Charcot believes it due to absorption of septic material. One refers the rigors to nervous reflexes. Ultimate course of gall stones depends on situation, as in ducts, gall bladder, ducts in liver, etc. In common duct produces biliary cirrhosis, etc. Icterus gravus, death. Yet in majority of cases patient gets well, stones pass. These stones may ulcerate into the liver and produce abscess of liver, or diffuse suppurative inflammation of portal vein, or abscess may open into peritonemum. In some cases gall bladder adheres to colon, stones ulcerate through and escape by stool. This may happen painlessly. In some manner stone may escape by parietes. In many cases of repeated attacks cancer of gall bladder is found, stones may cause cancer, or cancer the stones. If stones be in gall bladder, they may fill it completely, and then become encysted, or these stones may excite inflammation, suppurative or gangrenous, or abscess discharging spontaneously into peritonemum a hollow viscus, externally, etc. Gall stones are often latent, no symptoms, but are then in ducts of liver, sometimes in gall bladder.

PATHOLOGY OF GALL STONES.—Attributed to decomposition of bile acids which keep bile pigment and cholesterin in suspension. Then these are precipitated. When there is retention in bladder decomposition occurs, and pp. of cholesterin, etc. Gall stones contain 75 per cent. of cholesterin, also bile pigment, chalk and magnesia. Stones composed of pure cholesterin or pigment are rare—are found in ducts in liver; stones in liver itself have little cholesterin.

TREATMENT.—Obstructive cases—Time will remove jaundice of frequent pregnancy, purgatives, the constipation, etc., ovarian tumor by operation, etc. Nature gets rid of bile pigment by kidneys, hence these now need protection, skin also eliminates pigment, promote function of both. So give often a warm bath with lots of soap, wear flannel and avoid cold. Do not give diuretics as a rule, lest kidneys be over-stimulated, hence damage; occasionally give Digitalis. Do not give alkali or mineral acids as they are chologogues. Since bile is absent from digestive canal, give gr. 5 to 10 of inspissated bile in capsules about 4 hours after meal, that is, after gastric digestion has ceased, also exclude fat and alcohol. Liq. Pancreatici or extracts of Pancreas are also good; has three functions, give 2 to 2½ hours after meal. Avoid fats, use lean meats, starchy food, etc.

JAUNDICE CATARRHAL.—There is seldom pain enough to require leeches if you do apply to anus. Fomentations, stipes also relieve pain. Internal remedies are emetics and purgatives. Emetics, as when some retained food causes the trouble. After emesis a saline is usually given. Some give Calomel gr. 2 to 5, and follow by Mag. Sulph. dr. 2 or a Seidlitz, all these tend to relieve liver. Alkalies, Sod. Carb. or Pot. Carb. gr. 10 to 15, alone or with a little rhubarb, is also good. Taraxacum, Rhubarb, Gentian and Sod. Carb. is a favorite combination. A course of mineral waters for 5 to 6 weeks is good, or Carlsbad Salts

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oz. $\frac{1}{4}$ to $\frac{1}{2}$ in pint of water every morning before breakfast, a good imitation. If patient be gouty add Colchicum and Pot. lod., if syphilis accompanying add Pot. lodid. If jaundice becomes chronic, Am. Chlor. is the great remedy. Diet should be spare, not at all rich, but milk, gruel, light broths, cooked fruit, lean meats. Recommended by Dr. Ross—a mechanical method of curing is the injection of 2 pints to 2 $\frac{1}{2}$ gallons of cold water, 60 deg., slowly into bowel, and letting it remain for 5 minutes, will cure by a reflex. Repeat daily, good for mild cases, cures by 4th day.

TREATMENT OF GALL STONES.—In all cases suspected to be gall stones, take care to watch stools to find stones to prove diagnosis, and shew that cause is removed, and hence jaundice will abate. During attack give Morphia, or if it be not sufficient give Chloroform; promote relaxation of spasm by hot bath, drink liberally of water; to test formation of stones is not satisfactory. First matter is diet, abstain from starch, sugar, fat and alcohol (peas especially). Second, give exercise outdoors. Remedies, all unreliable. In Europe send to an alkaline spring to drink these waters, Carlsbad, Vichy, etc. You can imitate these. Another remedy is Durand's, 3 parts Ether to 2 parts Turps, give m. 20 to 30 T.I.D. It is a solvent of cholesterin. Sod. Salic. gr. 10 to 20 T.I.D. is also so used. Chloroform is also given as a solvent (?). Harley's combination is Carb. Sod. and Sulph. Sod. every day. Sod. Sulph. dr. 1 to 2, Sod. Carb. gr. 20 to 30, given in a bitter infusion in a. m. before breakfast. He also gives during the day a little Sod. Carb. in Taraxacum B.I.D. An old-fashioned remedy is large doses of Olive Oil, half pint taken in 2 parts. It produces copious evacuations containing masses resembling calculi, but are not; still, great relief is often afforded.

SURGICAL TREATMENT has been very successful. Cut down in bladder and remove gall stones; in other cases gall bladder is stitched down to colon and opened there, bile escapes by stool (cholecystotomy). In other cases gall bladder is extirpated (cholecystectomy). 1. Lawson Tait says surgical aid is needed when there are repeated paroxysmal pains in region of gall bladder if proved to be from gall stones, yet many get well without surgical aid. 2. Operate in all cases where obstruction has occurred, especially if in hepatic duct or common duct as soon as it has produced jaundice. 3. If gall bladder is ruptured you must operate to save from peritonitis. Tait has operated in malignant cholæmia, and saved life for several months.

NON OBSTRUCTIVE JAUNDICE.—Diagnosis is hæmatogenous jaundice, exclude all causes of obstruction, and look for others, as the fevers or poisons; enquire into mental emotion; or do you suspect yellow atrophy, look for pyæmia, malaria and other causes. Additional facts,—if stools are not clay colored, are natural or dark, if skin is only lemon color, if urine be not the deep orange of the (5) obstructive form. It is usually red, sometimes is dark like porter. The coloring matter is not bile pigment, is altered hæmoglobin (methæmoglobin), recognized by spectroscope. Boil such urine, separate hæmoglobin into albumen and hæmatin. No green color with Nitric Acid. If treated with Chloroform will give a red

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color instead of yellow. Iodine gives no reaction while it turns bile pigment green. 6. If at time of occurrence of jaundice pulse becomes irregular and weak, ditto heart, perhaps intermittent, pulse usually not slow. 7. The urine contains albumen. 8. The absence of itchiness of skin, absence of lowered temperature favor it being non-obstructive form. If the nervous symptoms of icterus gravis set in, as drowsiness, coma, hemorrhages, it is non-obstructive.

TESTS FOR BILE.—There are really no reliable tests for bile acids at bedside. For pigment, Nitric Acid (fuming) added turns urine green, purple and yellow. But the pigment may be already oxidated, hence Nitric Acid does not act. 2. A solution of Iodine in Pot. Iod. gives a green color. 3. Chloroform agitated with biliary urine separates pigment, yellow, if haematin red. Pettenkofer's test is: concentrate the urine, put in test tube, put in crystal of white sugar, and drop by drop add H_2SO_4 , and a purple ring forms around the sugar. Test is not reliable, for bile acids may be present and no disease, and this reaction may occur and no bile acids be present. In some cases test for bile does not work till urine has stood some time.

ACUTE YELLOW ATROPHY is very rare, death may be in 24 to 48 hours. Liver becomes rapidly reduced in size and very soft, hence in percussion day by day there is diminished resonance. The softening is due to acute fatty degeneration of hepatic cells. Spleen will also be fatty and destroyed, ditto kidneys, heart's muscle. Blood is affected, hence hemorrhages in all cavities. Symptoms of icterus gravis are noted. Thus disease may be preceded by catarrh of stomach and bowels, thirst, coated tongue, anorexia, vomiting, constipation or diarrhoea, usually some fever. But in 1, 3 to 5 days symptoms of icterus gravis set in, as jaundice, not intense, surface cool and dry, later on may be hot, pulse is less frequent, pains felt in region of liver, sometimes tenderness on pressure, rapid diminution of hepatic dullness. Sometimes this rapid wasting does not occur. There is generally repeated vomiting, becoming later on black (blood). The icterus at first is due to obstruction in smaller ducts of liver from the catarrh, hence cool skin and slow pulse, but afterwards it is a case of destruction of liver. The hemorrhages may be from all the mucous surfaces. Stools may contain bile at first, but soon become clay color. After death bile passages are unstained, for no bile is secreted there. Finally, patient becomes drowsy, muscular tremors, delirious, convulsions, coma. In this final stage there may be an elevation of temperature 101 to 102, but occasionally it remains normal. Examination of urine,—that secreted at first is normal in amount, contains little bile pigment, later on contains none. Such urine in bulk is not black. Nitric Acid may give an imperfect reaction. The urine is found to gradually lose its urea, phosphates, sulphates, chlorides, for functions of both liver and kidney are destroyed, double poisoning. A drop of this urine will contain tyrosin and leucin, abnormal. Evaporate, and spheres bristling equals tyrosin, or flat oily plates are leucin.

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CAUSATION.—Mental emotion, rare. Commoner in women than men. More common in pregnant women half, but is rare.

AGE.—Common under 30, rare in children. Is thought to be an acute specific febrile poison introduced from without. Phosphorus poisoning produces like symptoms. It has occasionally followed typhus and syphilis (coincidence). It is possible the ptomaines may be the toxic agent.

TREATMENT OF NON-OBSTRUCTIVE JAUNDICE.—Same treatment applies to acute yellow atrophy. 1. If it occurs in course of a disease then treat that disease particularly. 2. Sometimes it is idiopathic, then eliminate by kidneys, skin and bowels,—the toxic agents. Give an active purge, some give a mercurial purge followed by a saline. A good one is Mag Sul. dr. 1, Mag. Carb. gr. 15, Spts. Am. Arom. dr. $\frac{1}{2}$. Skin is acted on by warm baths and Pilocarpin every 2nd or 3rd night. Antifebrine also may do good. For delirium give ice applications. For coma, cold head douche. If pyæmia or malaria is suspected, Quinine is good. Plenty of cold water to drink acts as diuretic. If from phosphorus poisoning you should give Old Turpentine (ozonized), if the phosphorus be yet in stomach. Acid French Turpentine is better. To restore the blood inject blood by transfusion.

HEPATITIS, inflammation of liver, is almost unknown here, so is not lectured on.

XLII. DISEASE OF PERITONEUM.

Is almost always secondary, often from extension of inflammation from some adjacent organ, frequently due to ulceration, as of simple gastric or malignant or tubercular typhoid, of bowel. Often due to rupture, as of gall bladder, stomach, bladder, etc. It may extend from chest or parietes. Embolism of mesenteric artery, hence hemorrhage. It is occasionally met with in Bright's, or acute rheumatism, or in all the exanthems—pyæmia frequently ditto—puerperal. It is often found with tubercle and cancer, and some cases seem idiopathic. Some deny this, but it may happen from exposure just as pleurisy may be induced. This would be primary peritonitis. It has been found that air, bile, fæces in rabbits, in peritoneal cavity, if small in amount, may not cause peritonitis, for this may, be absorbed or localized. But if material be large in amount, or peritoneum denuded, or open wound exist, then it will cause peritonitis.

SYMPTOMS OF ACUTE PERITONITIS.—When it occurs idiopathically or from infection is preceded by a distinct rigor; if from extension, rigor may be absent. Pain is first symptom, intense, aggravated by pressure. Patient lies on back or side, knees flexed. Respiration is thoracic, countenance anxious. Tongue a little coated at first, usually thirst, sometimes nausea, especially if upper part be inflamed, obstinate constipation generally. Temperature often raised, often not. Will be low if a blow or rupture initiated the peritonitis. Pulse wiry, narrowed, often though may be soft and compressible. Parietes of abdomen from outset

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are tense, to protect, is a valuable sign. If you touch parts it is apt to occur. Abdomen becomes tympanitic. In second stage, serous effusion occurs, fluctuation often noted, even friction.

PROGRESS AND COURSE is rapid, 24 to 48 hours may bring it up to this stage. As disease progresses, pulse becomes rapid and thready, vomiting incessant, countenance pale, thin, vomit dark green or blackish, bowels may now relax, bilious or bloody stools, surface becomes cold, covered by clammy sweat, hiccoughs, startings in sleep, and death in coma and convulsions. In bad cases it may be fatal in 24 to 48 hours (perforation). General cases last a week or longer. Pain ceases in last stage. Cause of constipation is paralysis of muscular coat of bowel from contiguous inflammation. Recovery may be perfect, complete, prompt, but in other cases if effusion were sero-purulent may take months. In rare cases it becomes chronic.

LOCAL PERITONITIS.—Pelvic—below brim of pelvis common. Symptoms—pain low down, extending into thighs along branches of "sacral plexus," vomiting not early, tumors of inflammatory products to be felt in examining per vaginam. Not so fatal as general form. Peritonitis in right iliac fossa.

CAUSES.—Inflammation of appendix, from tubercular ulcers, etc., apple pits, grape seeds, faecal concretions in appendix. If from inflammation of caecum, habitual constipation and impaction of faeces in caecum initiates inflammation. In both cases inflammation extends to peritoneum. Caecitis or typhlitis and appendicitis are not always distinguishable; sometimes are, if appendix lies behind.

SYMPTOMS are: caecum you cannot tell from typhlitis. If in pelvis, you may not detect tumefaction. The great group of symptoms are similar. 1. Pain referred to site, increased by pressure; sometimes you can make out deep-seated fullness, gradually becoming more prominent, and dullness appears. Finally, a palpable tumor appears. This will be below level of crest of ilium, two finger breadths above Poupart's. If from typhlitis you would get earlier evidence of tumor than with appendicitis, and at first you can move superficial parts over it. Leg will be drawn up, especially in typhlitis, also pains along ant. of thigh, in testicle, scrotum, penis,—neuralgic. If it be typhlitis, patient will admit constipation. Marked constipation, vomiting and fever are also noticed. In cases from perforation, symptoms begin suddenly with pain at site. There will early be deep-seated resistance, sometimes a tumor in right iliac fossa. In appendicitis you seldom get a distinct tumor, never early. In both, the inflammation may be behind caecum, and inflammation products may be large and yet no tumor found. In some cases of appendicitis or posterior caecitis, a peritonitis may not be set up, but a phlebitis of large veins and pyæmia.

COURSE.—Typhlitis generally gets well, fever abates, pain leaves, bowels move, induration leaves. This sometimes happens in appendicitis. In other cases cure is not complete, parts bound down by adhesions. In appendicitis unfavorable issue is common, for sloughing of organ occurs. A localized peritoneal abscess. So long as this abscess does not discharge into peritoneum there

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is hope. It may open cæcum and point like a psoas abscess, sometimes into the uterus, etc. The disease may begin in the cæcum and extend to the appendix, and vice versa. Inflammation from appendicitis may extend to the peritoneum, through it leaving an abscess in the iliac fossa, hence pointing below Poupart's lig., or along pyriformis, and pointing back or into the hip joint, sometimes points above Poupart's lig. It may pass up behind the cæcum, and point in the back like a lumbar abscess. It may even perforate the diaphragm and get into the pleura. It may open into any hollow viscus, into the peritoneum; if suddenly, you get acute peritonitis; if slowly, will give local peritonitis subsiding by adhesions, followed by second attack, diffuse and fatal. Sometimes the inflammation meets the ilio cæcal vein, sets up phlebitis, hence hepatic abscess. The original peritonitis may be primarily diffused, not localized.

PERITONITIS FROM PERFORATION.—A simple ulcer of the stomach or duodenum, perforates or full bladder bursts, etc., with escape of contents. The invasion is sudden, and is accompanied by shock, hence cold, pale, pulseless extremities, cyanotic, little reaction, incessant vomiting, pain rapidly spreads. If he rally, reaction is poor, death rapidly follows in 1 to 3 days. In some cases there is no pain complained of, as in typhoid, but there is always tenderness at that spot abdomen distends.

MORBID ANATOMY is similar to pleurisy, which see. Products may be serous, fibrous, purulent, hemorrhagic, etc.

DIFFERENTIAL DIAGNOSIS.—Colic sets in suddenly, not accompanied by chill or followed by fever, is spasmodic, relieved by pressure, rarely vomiting, no tenderness on pressure, pulse not greatly affected.

CATARRHAL STATE OF INTESTINES, as mucæ or sero enteritis. The pain is griping, not pungent or burning, is not as easily increased on pressure, for inflammation is within the bowel. Not the same difference in breathing; pulse is soft, not wiry; there is apt to be diarrhoea, not constipation; vomiting if the affection is in the duodenum, not otherwise perhaps.

HYSTERICAL ABDOMINAL PAIN is not preceded by rigor or followed by fever, tenderness is exquisite on the slightest pressure, but get her interested in something; leaving the hand there, you can press deeply without pain sometimes. Abdominal distention or constipation, nausea and vomiting generally absent, patient is suggestive of hysteria, emotional. The history may show hysterical attacks. The symptoms are incongruous, do not point to inflammation. If in doubt, treat for peritonitis, for it does no harm any way.

TREATMENT OF PERITONITIS of secondary form, as from inflamed ovary, etc., or of idiopathic cases.—If symptoms are active put on 12 to 18 leeches over the most painful spot, and follow by hot water fomentations, cover by batting and oil silk. Put the patient under Opium, inject Morphia $\frac{1}{2}$ gr., and keep under the influence, but do not reduce the respiration below 12, or too drowsy to answer rightly, and watch the pupils. Opium relieves pain which may kill; it prevents

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peristalsis, and has a direct antiphlogistic effect, reducing the nervous influence and inflammation. You may apply 2 to 3 turpentine stupes per day and hot water stupes in intervals. In some forms use Mercury with Opium, not if from perforation, as it destroys the plasticity of the lymph. Do not use in pyæmic or Bright's, peritonitis or cancerous, or if the cause comes from internal strangulation. Give Mercury in small doses, watching gums; avoid purgatives, do not move the bowels, for if you remove the inflammation the spasm of the bowels relaxes and the bowels move spontaneously. You might coax bowels by 1 or 1½ pint injection if they are torpid after. Blisters over the abdomen are no good in early stages, but are good later to promote absorption; for tympanitis enema ½ oz. of Asafetida in a pint of gruel, or use turpentine, or leave a long rectal tube in the rectum. Turpentine by the mouth is often good, give in capsules m. 10 to 15 every 24 hours, or give it in milk. In some obstinate cases bowel is perforated by a fine trocar; be careful. The hicough may yield to Morphia or Ether by the mouth, or inhalation of Chloroform.

DIETETIC TREATMENT.—Allow as little food as possible by the mouth, never more than a tablespoonful at a time; relieve the thirst by a teaspoonful of water, or give it warm, slacks the thirst better than cold water. Ice is better for vomiting, or inject 2 oz. B. I. D., of peptonized food by the rectum. As strength fails give stimulants, watch death tendency, and combat. In excreta from constipation at the beginning if early give a purgative, not when inflammation is actually set up.

TREATMENT OF PERFORATION.—Give Opium at once to give rest to the bowel, and try to so get the opening sealed up. If in the stomach or duodenum give nothing by the mouth, but by the rectum and skin; you can feed the patient well under the skin,—milk and Braid's essence of beef. If perforation is low down, as in typhoid, you can give a little by the mouth.

SURGICAL TREATMENT (peritonitis).—If from perforated appendicitis its diagnosis is comparatively easy. Its eventual treatment by laparotomy is frequently indispensable, urgent symptoms demand immediate exposure of appendix after recovery from shock, provided the symptoms are of general peritonitis. If delay is warranted, the resulting abscess should be opened as soon as it is evident,—that is, about the 3rd day. Removal of the appendix is not often curable. In cases confined to the cæcum with paratyphilitis in which symptoms are local, immediate surgical treatment is not demanded, for cases are not so active; explore by aspirating needle a resisting tumor. Wait 6 to 7 days to allow of peritoneal adhesions, shutting off from peritoneal cavity, and then you can open safely. In perforation from typhoid operate at once to prevent general peritonitis and rupture of the gall bladder. In acute peritonitis ending in suppuration, open early; if abscess is found, open and drain. Disorders involving peritoneum not relieved by general treatment warrant exploratory incisions; even tuberculous peritonitis is operated on, and if primary prevents death.

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XLIII. INTESTINAL OBSTRUCTION (MECHANICAL).

In ileum, symptoms are vomiting fecal matter, constipation, pain may be due to colic, etc. Classification of the obstructions: 1. Faecal, common in those troubled with constipation, therefore more in women of advanced life, accumulation found oftenest in cæcum and rectum. 2. From concretions and foreign bodies. The concretion may be dense and heavy from Phosphate of Lime or Magnesia along with debris of food called "entroliths." These vary from chestnuts to orange to 4 lbs. in size. In others, the stone is as light as a compressed sponge, contains also earthy salts, but not in excess; are also found oftenest in the cæcum and rectum, but also in small intestines, especially if they have diverticuli. They are mostly seen in young adults. There are also mineral concretions as of Magnesia seen in chlorotic girls from eating slate pencils, sometimes Sulphate of Iron from pills, sometimes chalk, sometimes a gall stone may be large enough, stopping up the ileo-cæcal valve. Foreign bodies, cherry stones, fruit stones, etc. 3. Internal strangulation, as twisting of bowel, or a knuckle of intestine may slip into foramen of Winslow, or an artificial foramen from adhesions, or sometimes slips under the appendix, if adherent. Meckel's diverticulum may give a cause from bowel winding round it. Plugging from gall stone. 4. Invagination and intussusception. All parts may be affected thus. 5. Permanent stricture of the bowel may cause it from chronic inflammation, but the cancerous form is the commonest, and found oftenest in the sigmoid and rectum, sometimes in the colon. False membrane is formed across cavity of intestine. Torsion and sigmoid flexion. 6. Pressure on the bowel from without, as ovarian tumor, retroverted uterus, pelvic exudations. 7. Congenital malformations, imperforate anus, etc.

SYMPTOMS.—Two groups—acute and chronic. To the first belong all cases of internal strangulation and most cases of invagination composing $\frac{2}{3}$ of all the cases. To the chronic belong impacted feces, concretions and foreign bodies, stricture, tumors, accumulation of fat in the intestinal walls acting as tumors (rare).

SYMPTOMS OF ACUTE FORM.—Generally suddenly seized with uneasiness in the abdomen, desires to evacuate the bowels but cannot, or a little blood and mucus, or a small stool of what is below obstruction passes, none after; abdomen contracts, and violent peristaltic efforts occur accompanied by pain, trying to overcome the obstruction. Vomiting now occurs, first the contents of the stomach, then green matter, bile, finally yellow stinking fecal matter. Often this persists, inflammation sets in at the point of obstruction, definite pain, and tenderness there, enteritis, fever general and finally peritonitis, collapse and death from exhaustion. Another mode,—patient may have first a colicky pain with vomiting etc., and you only find out after that he is constipated. Sometimes patient feels as though something had gone wrong in the belly, as a twist.

SYMPTOMS OF CHRONIC FORM slowly developed, subject to constipation, which passing off is followed by a copious discharge indicating accumulations. There will be afterwards the other symptoms, as vomiting of fecal matter, patients

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have passed no stools for 7 months, others have been troubled for years, passing 3 to 4 stools per year, relieving themselves by vomiting. The inflammation will cause collapse, peritonitis; over-distention of bowel will cause collapse, or bowel may rupture, hence peritonitis, collapse or strangulation will kill. Collapse sometimes beginning at onset is due to shock, as in cases from twisting of the bowel in a weakling.

INVAGINATION—common in children. Varieties: first, ileo-cæcal—ileum and cæcum are invaginated into colon 56 per cent., 2nd ileæ 28 per cent., jejunic 4 per cent., chronic 12 per cent. It is a disease especially of childhood, may also occur in adults; often in death struggle, if there be convulsions, lower bowel paralyzed, commoner in male.

SYMPTOMS OF INVAGINATION.—Sudden and violent pain, sudden obstruction, usually a call to stool and straining at stool, passing scanty fecal matter at first, then mucus and blood with tenesmus. If an aperture does exist, a little fecal matter may come through; do not confound it with dysentery. Then comes abdominal distension, vomiting becoming fecal in 3 to 4 days. Often an oblong tumor can be felt, feel at first visit before abdomen becomes distended. Local enteritis ensues.

PROGNOSIS.—Case may terminate fatally in 4 to 5 days from gangrene of the intestine, involved strangulation of it, peritonitis or shock. It is interesting to note that the bowel enclosed may slough away, and patient recover; more apt to occur in small intestine. Continuity of the bowel is maintained by apposition of serous surfaces. This sloughing in small intestine takes 10 days, in large 20 days, and in last may save life in a third of the cases. Sometimes adhesion is formed, gives way, and contents of the bowel escape, hence death. Sometimes the case is chronic with recovering attacks, all the time there is a piece of bowel invaginated, tumor found.

SYMPTOMS OF INTERNAL STRANGULATION.—1. Sudden and definite onset of disease in acute strangulation. 2. Collapse at commencement. 3. The comparatively early age. 4. Severity of pain referred to in umbilical region. 5. Absence of hernia, umbilical, obturator, etc. 6. The absence of precursory symptoms or visible peristalsis, as in stricture. 7. Absence of tumor as in invagination, hemorrhage or dysenteric symptoms. 8. Absence of extreme intensity and rapidity of progress as in twist. Thus the twisting; same symptoms are noted but 3 points different. 1. Symptoms more rapid and violent. 2. Occurs in older people over 54. 3. In half the cases twist is in the sigmoid section.

STRICTURE FROM CANCER.—Cancer is the cause generally in slow obstruction, early symptoms of disorder in the bowels, pain recurring at given site, symptomatic and gradual obstruction. Age—rare under 50, tumor or cancer elsewhere. Site—4 times as often in left side as right, especially in colon and rectum; 75 per cent. of the cases occurs in the sigmoid section in rectum. Of remaining fourth but two occur above ilio-cæcal valve, symptoms last longer, 2 to 3 days after a complete obstruction is duration of length.

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Faecal matter is often streaked with blood and pus, bowel often reduced in size, like pipe stems, attended with pain. You can feel the cancer if above the pelvis, or by your finger, or a bougie if in the pelvis per rectum. Often in sigmoid cancer you have free hemorrhage of the bowel, mistaken for piles, sometimes dysentery is simulated, so in rectal troubles insert your finger.

GENERAL DIAGNOSIS.—In every case of abdominal trouble examine the surgical sites for external hernia, remember obturator hernia. Let first examination be exhaustive before the abdomen distends, mark tumor or tender spot, percussion on the tender spot, dullness may be noted from accumulated feces above obstruction. This dullness will increase from day to day; if there is early and incessant vomiting obstruction is generally high up, if low down you especially get faecal vomiting in a few days. Insert finger into rectum. If it cannot reach far enough insert bougie or stomach pump; often by injecting water you can get tube up farther. Often the tube is arrested by folds of sigmoid or by Nelaton's superior sphincter. 5 inches from anus or by sacral prominence, practice will pass it 12 or 18 inches into the descending colon. Some recommend passing the hand up the rectum. If the hand is large, divide the sphincter. This is not often done, however. May discover stricture, impacted feces, etc.

TREATMENT OF INTESTINAL OBSTRUCTION depends on the cause. If you cannot find a cause, adapt remedies for curable cases. These are, relieve the pain and check excessive peristalsis, using Opium gr. $\frac{1}{2}$, or Morphia gr. $\frac{1}{4}$ by the skin, repeating Bellad. also checks spasm and does not cause constipation. Give in large doses Ext. $\frac{1}{2}$ gr. every two hours, even 2 grs. hourly for 12 hours has been given. Opium for severe pain, Bellad. for the less severe pain. Prevent over-distention of the bowel, hence collapse. Therefore attend to diet, so starve patient as much as possible. As little fluids as possible, give ice to suck, tablespoonful of water as seldom as possible; feed by rectum of peptonized milk 4 oz. every 8 hours, for supporting treatment is needed. Stimulants may be needed, brandy or wine. Modern practice is to wash out the stomach by siphon tube and tepid water. It palliates symptoms, relieves vomiting and thirst, empties bowel above obstruction, and promotes normal peristalsis. Repeat washing 2 to 3 times every 24 hours. Puncturing the distended bowel to let off the flatus is sometimes done with precautions. These precautions are previous dose of Opium to lessen movement of bowel, pierce the most convex part of distention, avoid that part of the bowel where there is gurgling, as fluid may escape. Flatus alone may keep a bowel locked under an adhesion.

TREATMENT OF FAECAL ACCUMULATION.—Give large enemata of warm water 101 to 104 deg., from 2 to 4 pints, repeating often at one sitting. Warm olive oil will often work when hot water will not. You may break down the mass with the finger or a spoon if the rectum and sigmoid be filled.

TREATMENT OF INVAGINATION.—Reduced often (?) by large enemata of warm water after putting patient under Ether, throw in a gallon if you can. It may squirt all over the room, but keep on. Let an assistant hold a wet cloth around

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the tube in anus to keep the water from squirting out. Only a small percentage of cases successfully treated thus. Old method was filling the bowels with air. Another was to give Mercury or small shot by the mouth, but they did it by the wrong end. Put it in by the anus and hold the child's head down, it then catches in the folds of the invagination. This is a dangerous method, however. When spasm is a complication, give an enema of tobacco infusion, it produces deadly faintness, spasm ceases. If gaseous tension is keeping up the obstruction you may puncture. Give big dose of Opium 4 hours before, no food for one hour, and then perforate bowel distended with air. Another method is abdominal taxis. Inject a gallon of warm water, patient being under an anæsthetic, then by side pressing of abdomen try to undo the damage. If it fail, invert patient after letting water out, and knead the bowels. If all these methods fail, then comes

OPERATION.—If you have good reasons for believing in your diagnosis, then perform laparotomy and find the trouble. You should take 24 hours to make your diagnosis sure. To wait 3 to 4 days is fatal. Vital depression is hardly recoverable from. Some surgeons make large incisions. Tait lays open abdomen early, and seizes first part of distended bowel presenting and makes artificial anus. He says it is dangerous to wait to make an accurate diagnosis, hence relieves symptoms by artificial anus, and operates for obstruction later. In cases of stricture they are nearly all cancerous, and in rectum and sigmoid, so make artificial anus in left loin—sometimes rectum can be excised. If disease is higher up, anus may be made in right loin. In invagination operation has little success. In colic cancer excision of affected portion is done and bowel reunited—is desperate, 40 per cent. die and disease recurs. In cancer of rectum and sigmoid do not wait too long else secondary ulceration is apt to occur in cæcum, hence fatal peritonitis. If obstruction is from tumor it may be removed by laparotomy; sometimes aspirating bowel will do temporarily.

XLIV. DYSENTERY.

Is an inflammatory affection of colon; is 1, simple, or 2, specific infectious form. This last is due to specific germ entering system, sets up specific fever with local lesions in colon (as in typhoid). Simple form is merely inflammatory. The specific poison is situated in stools which will propagate the disease. It has not yet been isolated, etc. Dysentery may be a secondary or primary affection. The former, when it succeeds another disease, as typhus, measles, scarlet fever, pyæmia, scurvy, typhoid. When secondary, it is not necessarily specific; may be a simple colitis, but may be specific. There are no differences between simple and specific forms, both may be mild, catarrhal, or croupous, diphtheritic. Dysentery may be acute or chronic, mild or severe.

ACUTE DYSENTERY.—Symptoms, mild form: Premonitory symptoms may occur like a cold lassitude, or perhaps dyspeptic symptoms or diarrhœa. The immediate attack is with chilliness, diarrhœa, at first fæcal changing to mucoid. There is apt to be soreness in colon and rectum. Each stool is accompanied by griping. Tongue gets furred, patient exhausted. Fever is seldom high, coun-

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tenance gets haggard, skin cold, clammy, pulse weak. Abdomen is now retracted, colic precedes each stool, which is now watery, perhaps bloody with scybala. If lower end of colon or rectum is involved, we have tenesmus. Bladder sympathizes, hence painful and frequent micturition, stools now apt to be free from faecal matter, all mucoid. If affection is in caecum there is no tenesmus. Strength rapidly fails, tongue typhoid. Evacuations are now thin, beef washings, and stink horribly, sometimes brown, green, and contain minute sloughs or flakes of desquamation. Abdomen is now tympanitic, tender. In bilious form, met especially in malarial districts, stools at first are covered with bile. Malignant or typhoid form—tropical—is dysentery with typhoid symptoms. In this usually treatment is of no avail. Opium can be given in large doses. Try mineral acids or per Salts of Iron, try Ac. Carb. If scorbutic symptoms exist, treat it—use Lime Juice especially. There is marked prostration, surface muddy, dry, or damp and cool. Petechiae common, pulse feeble. If rectum be involved there is tenesmus. Towards close there are marked typhoid symptoms, dry dirty tongue, sordes on teeth, low muttering delirium. Scurvy may complicate. Sometimes there is suppression of urine. Sometimes sloughing occurs. Pyæmic symptoms sometimes. Ordinary mild form recovers in a few days to a week, no lesions left, but malignant specific form may last weeks and months. Ulcers form in walls of gut, pyæmia and hepatic abscess often form, sometimes joints are affected as in rheumatism, peritonitis often ensues. Prophylaxis against epidemic dysentery:—

1. Guard against the predisposing causes.
2. Remove filth, clean privies, drains, etc.
3. Avoid overcrowding.
4. Take good food, not likely to cause diarrhoea, indigestion, etc.

CAUSES OF DYSENTERY.—Cold to abdomen or feet, etc. Food—deficiency, as in starvation, famine, or bad quality of food, or on salt food, hence both scurvy and dysentery; or decomposing albuminous food frequent in infants from unclean bottle. Accumulation of faeces is occasionally followed by dysentery, absorption of faecal products. Impure water, bad from sewerage, etc. River water with excess of mineral matter causes it in strangers, hence boil and pp. the lime. Impure air, especially if contaminated by sewage or faecal matter, as in filthy camps. Malaria seems to have some effect (marshy). The severe form (specific), which occurs both epidemically and endemically, has its favorite habitat in the tropics, 30 to 40 degrees on either side of the equator. It is thought these germs require certain temperature—moisture and quality of soil favorable to propagation—these conditions found in tropics. Causes of simple dysentery will predispose to specific form.

MORBID ANATOMY.—Dysenteric inflammation may be catarrhal or diphtheritic—both forms treated before. It is an affection of colon, especially lower end, and may extend all the way up, seldom into small intestine. Examine sigmoid and hepatic flexures. Its inflammation leads to ulcerations, these healing from cicatricial tissue contracting lumen of bowel. Coloring matter of blood stains ulcers blue. In profound cases atrophy of intestinal canal from mouth to

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anus. Dysentery leads to hepatic abscess in tropics, not in temperate climates. Diff. Diag.—ulcer, polypus and cancer of rectum give blood, pus, etc. Examine by speculum. In these cases the blood, etc., may escape without stool at irregular intervals, note the pus. Diff. Diagnosis—diarrhœa. More or less fecal matter, blood not often present, mucus not much, tenesmus and dysuria rare. Dysentery—little fecal matter, blood present, great deal of mucus, tenesmus common.

TREATMENT (mild form).—1. If you see at beginning give warm bath. 2. Put patient to bed, important to rest. 3. Give dose Castor Oil $\frac{1}{2}$ to 1 oz., Laudanum m. 10 to 15, or add Spts. Chloroform $\frac{1}{2}$ dr. To some you will have to give Pulv. Rhei Co. instead of oil, or Calomel or Blue Pill; add Opium sinapis, or Turps fomentations to abdomen are grateful. It is necessary to keep in bed. 4. Place patient on mild diet, milk or broths (mutton), no solids. Above will often check. In severe forms begin with above. 5. Large doses of Ipecac are especially good, gr. 20 to 30 of Pulv. Ipecac. Take no food for 1 to 2 hours before, 2 to 3 hours after. You may give it in a capsule, or in a little ice water or in pills, or in 1 dr. Syr. Aurantii, aqua $\frac{1}{2}$ oz., or in bitters. If dysentery is malarious add Quinine. Some give $\frac{1}{4}$ gr. Ipecac every $\frac{1}{2}$ hour instead of big doses. In dysentery never begin Opium treatment till bowels are cleared out. Do not give drink, let him rinse mouth with water. You are afraid of drink, it will cause vomiting—you want Ipecac kept down one hour—if emesis now occurs only gastric juice is ejected. Ipecac will cause vomiting, thus unloads portal system. Then allow light food. In 24 hours repeat Ipecac, or even in 12 hours in severe cases, giving nourishment some hours between. It relieves the tenesmus, etc. Hot cloth to anus or ice in other cases, or injection of warm oil, or hot hip bath, all relieve the tenesmus, or enema Ac. Carb. gtt. 2, to 1 oz. starch sol. An injection of Laudanum in starch gives comfort, relieves the tenesmus, use a small enema. As disease subsides reduce Ipecac gr. 10, or if case is doing good give Dover's Powder gr. 8 at night, and return to Ipecac in a. m. During case keep warm cloths on abdomen. Treat tenesmus with lump of ice in anus, or inject pint of warm gruel, and keep cloth on anus hot, or inject Laudanum in starch. Even in acute dysentery in children Ipecac is good, gr. $\frac{1}{2}$ for child 6 months old, gr. 1 for one year, and 1 gr. for each year after up to 18 years. Salines have been used. 1 oz. Mag. Sulph. in pint of beef tea, or alternate salines with Pulv. Ipecac. Co. Drink wineglass every two hours of saline, gives free evacuation; repeat when stools become mucoid, scybalous, etc. Is used by French instead of Ipecac. Another method is injection of pints 3 to 4 of cold water up bowel. This water may be medicated, alum 1 dr. to pint, or Salic. Ac. or Nit. Silver gr. 40 to pint water—use fountain syringe with tips well raised. If colic occurs wait, it subsides in few minutes, then let more run in—use long tube and pass up to sigmoid—repeat 2 to 3 times per day. R. Ol. Ricini $\frac{1}{2}$ oz., Turps m. 10 to 15, Chlorodyne m. 10 to 15, makes a good emulsion to clean out bowels. As symptoms yield, diet is improved—avoid vegetables for a little time.

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XLV. GASTRITIS.

ACUTE, SUBACUTE, CHRONIC.—Acute form rare, is rarely idiopathic, due generally to some poison by irritants, sometimes follows drinking of large quantities of alcohol, or, if heated, large quantities of cold water. Then fevers often give acute gastritis, as gastric fever (typhoid), scarlet fever, yellow fever, etc., also gout, etc. A bilious attack means an acute gastritis.

CAUSES of subacute gastritis common.—Eating irritating, indigestible food, excess in eating, abuse of alcohol, decomposing food, anything which reduces gastric juice will operate. Causes of this deficiency are numerous, as any obstruction in portal circulation, as lung, heart and liver diseases, fever, nervous exhaustion, previous excesses, prolonged fasting, ardent spirits; atmospheric conditions which give bronchial catarrh may give catarrh of stomach, moist, cold and sudden chills, and then even ordinary food is an irritant. Uterine troubles, also passive congestion of stomach from cardiac, pulmonary or hepatic diseases Uterine disease, deficient menses, etc., will diminish gastric juice.

SYMPTOMS bilious attack.—Patient out of sorts for a couple of days, pains in back and limbs, low-spirited, sense of fatigue, then gets bad-tempered. Then stomach feels too full, tongue generally coated white, or thick and foul dirty fur, saliva viscid, thirst, nausea. Sometimes pain, even severe, cramp like, may be felt in pit of stomach extending to between shoulders, and aggravated by hot drinks. Vomit of tenacious mucus frequent, increased by food, appetite gone, mouth sticky, urine high colored, scanty; vomiting is followed by relief. If food passes into intestines we get colic, irritative diarrhoea, but sometimes constipation. Nervous system sympathizes, hence sick headache, greatly resembling sometimes migraine, sense of giddiness, dyspnoea, asthma, palpitation, attack of epilepsy, neuralgia, if predisposed, in children even convulsions. Acute indigestion is a common cause of convulsions in children. In the aged it may cause apoplectic attacks.

TREATMENT subacute gastritis (bilious attack).—If irritating food be retained give emetic if meal be recent, and follow by a cathartic, Castor Oil, add a little Tr. Opii; let patient abstain from food and as far as possible from drinks to give stomach rest. Take milk and lime water or thin gruel. If vomiting, give Bicarb. Sod. and Tart. Ac. and H. C. N. Dil. m. 2 and Morphia, or apply sinapis to epigastrium. Peptonized food may be needed. In severe cases put to bed. If pain, uneasiness continues in stomach, give Bis. Sub. Nit. large doses gr. 10 to 30 T. I. D., and Sod. Bicarb. or Liq. Potass. m. 10 to 15 and Tr. Hyoscy. If flatulent, give Sod. Salic. An attack often is cut short by a blue pill and a Colocynt pill at night followed by Seidlitz in a. m., so also will an emetic. Epigastric uneasiness is sometimes relieved by small pieces of ice, or small drinks of soda water. If there be much mucus vomited, and signs of fermentation, give alkalies, as Liq. Potass. m. 10 to 15, Sulphurous Acid or Sol. Sulphate gr. 5 to

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10, are rarely used to stop fermentation. Tendency to recurrence of bilious attacks in elderly people can be lessened by regulating diet and giving a nightly dose of aloes, or allow latter in pilule.

DILATATION OF STOMACH.—1. Results from bad hygiene, as too much food drinking too often, etc. 2. Morbid conditions, involving habitual delay of food in stomach, as dyspepsia, chronic gastric catarrh, obstruction of pylorus. 3. Debility of muscular coat, as in weak neurasthenic people, hysterical. At first dilatation, is transient. This dilatation is seen in course of or after many diseases, or in those suffering from *ennui*, grief, exophthalmic goitre, and the recurring distention becomes permanent. It is thought fatty degeneration of muscle occurs as in convalescence from typhoid, or in alcoholism, or lesions of gastric nerves.

SYMPTOMS are grouped variously, it may be latent and no symptoms. It often assumes a dyspeptic form, patient has aching in the stomach, slow digestion, foul or acid eructations, constipation, slight emaciation, often no vomiting. If due to obstruction of pylorus, muscle hypertrophies, hence visible outline of stomach, evident dilatation by percussion, vomiting of sour smelling matter, vomit less in frequency as stomach dilates, but larger in quantity, is yeasty (*sarcina ventriculi*). There is an intestinal form in 4 to 5 hours after meals, there are gastralgic pains set up by acid fermentation in stomach and bowel, the liver may be enlarged and feel heavy, sometimes there is jaundice from catarrh. There is a nervous form, person is fatigued and weary on waking. In the forenoon is subject to vertigo, migraine, cramps in extremities, flushing of the face, hypochondriasis, pseudo-angina. In 17 per cent of the cases the urine is albuminous, is often alkaline or neutral, acene is common, nasal or bronchial catarrh often attend. A recent writer says he finds the enlargement of middle joints of the fingers in cases of dilatation of the stomach—not always confined to these joints—due to absorption of Acetic Acid. Prove the dilatation by examination, as its symptoms are like gastritis. Percuss the stomach, when empty of fluid it naturally reaches only within one inch of umbilicus down and up as high as the lower border of 4th rib. If there be a quantity of fluid in the stomach you may be mistaken, for the upper part is clear, the lower part dull; alterations of posture will vary the dullness, or shake the person and listen for the splashing. In some cases distend the stomach with CO_2 by giving 1 dr. of Carb. Sod., and after 1 dr. of Ac. Tart., or a tube may be passed down to the bottom of the stomach. Natural distance from the teeth is $\frac{1}{3}$ rd of a man's stature, in cases of stenosis or great enlargement you will see and feel it, or by striking it with the fingers you can imitate peristalsis in it. In a dilated stomach only drink $\frac{1}{2}$ tumbler of water after fasting in the forenoon, and you will hear it in the stomach.

TREATMENT.—Regulate the diet, give meals at long intervals apart. This is good if patient can digest; if not, feed little and often. Food must be nutritious, not bulky, easily digested, no fats except Cod Liver Oil. Give but little farinaceous food. If bread, only toasted or crusts, unfermented bread is better than the other. Liquids taken sparingly—no soups, no tea—patient must not drink while

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eating, for he will masticate better. Let meal last long, take time. If he cannot digest well, give peptonized milk—give 1 to 2 tablespoonfuls every two hours to begin—1 pint milk equals chop. After, add the yolk of egg, then allow a little stale bread. Be careful of porridge, for it is not mixed with saliva. In certain cases you will need to give the food per rectum. When stomach contains fermenting food wash out with stomach pump. Medicines, chiefly antiseptics,—Creasote, Carbolic Acid, Sal. Soda, Iodoform, a chologogue, Chloroform water, oxygenated water. Dil. Mur. Ac. is best of all, is antiseptic and aids digestion. Add pepsin if in old people or those with degenerated mucous membrane of stomach.

XLVI. CANCER OF STOMACH.

All forms may occur, commonest is medullary forming nodules, especially found in pylorus. Scirrhus would cause induration, adenoid form made up of glandular tissue, tubular tubes lined by cylindrical epithelium colloid form infiltrates, induces large growths, squamous form affects cardiac end. Simple ulcer of stomach produces similar symptoms.

DIFFERENTIAL DIAGNOSIS.

CANCER.

Age—rare under 30.

Common in aged.

Site—Especially attacks pylorus, also found in lesser curve cardiac end, or it may involve entire stomach.

Anorexia—common and early; if early, attended by cachexia, is suspicious.

Pain may be very late, not especially aggravated by food, not relieved, as by vomiting, nor dies away after digestion, is abiding.

Character of pain—lanceolating, may be burning, may only be a tightness.

Vomiting—even when the stomach is empty, copious blood rare, of coffee grounds usual in later, much mucus vomited.

Tumor—often discovered generally at pylorus, a pyloric tumor is to the right of the median line, and 1 to 3 inches below the ensiform cartilage.

ULCER.

Common, under 30 more common.

Though with advanced age.

Found oftenest on posterior surface towards lesser curve, may be at pylorus, cannot involve whole organ.

Hungry, but afraid to eat for the pain; no early cachexia.

Comes on after eating, relieved on vomiting or on completion of digestion, is intermittent.

Is intense burning.

Vomits when food is in, profuse hemorrhage occurs in 32 per cent., recover, not so much mucus.

Tumor absent, but very rarely occurs, is from adhesion, is not movable.

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Complexion—peculiar, earthy and pale, or greenish.

Early signs of cachexia.

Emaciation very rapid.

Microscope sometimes shews cancerous cells; in vomitus, rare.

In cancer there is permanent absence of H. Cl. from gastric juice, is also absent in atrophy of the stomach and chronic dyspepsia, even absent sometimes in healthy men. H. Cl. is deficient in chronic catarrh.

Absent, but chlorotic symptoms.

Signs of cachexia absent for a long time.

Never.

There is an excess of H. Cl. If symptoms last 18 months cancer may be excluded, and also if previous attacks of pain, vomiting, or hæmatemesis.

Test for Hydrochloric Acid—in the first 45 minutes of digesting there is nominally no Hydrochloric Acid, wait $1\frac{1}{2}$ hours and then use the stomach pump; use litmus paper; filter the mixture. Add weak sol. of Meth. Violet—gives a beautiful blue if Hydroch. Acid be present; or take 20 c. c. of water, 3 drops of Ferri Perch., 3 gtt. of a strong sol. of Carb. Acid—this gives a steel grey color to the mixture if H. C. L. be present, yellow if Lactic Acid is present. To test the strength of the gastric juice, take some of the filtrate, put it in two test tubes, put a little fibrin in one and fibrin of Hydroch. Acid 1 per cent. sol. in the other, and keep in incubator 6 to 12 hours. If that tube without acid has no digestion but the other has, then H. Cl. is absent; if no digestion in both, it means absence of pepsine.

DIAGNOSIS—Continued.

CANCER.

Perforation rare.

Duration, disease is progressive.

Destroys life in 1 to 2 years, rarely more than 3 years. Colloid; is very slow, quick progress means soft cancer.

Secondary formations appear, liver enlarged, or additional tumor found.

If secondary tumor be in the omentum it will be colloid, cancer generally has coma before death.

ULCER.

Perforation 3 times commoner.

Disease may last for years; may be arrested by proper treatment.

Not so.

PECULIARITIES RE SITE.—Cardiac cancer, pain on swallowing, and frequently regurgitation after swallowing, though part of the food lodges above the tumor. No tumor can be felt generally, epigastrium not enlarged. Pyloric cancer leads

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to dilatation of the stomach, muscular coat hypertrophies from stenosis. Vomiting at first frequent, but less frequent and more copious as stomach dilates, sour smelling, yeasty. Infiltrated cancer—organs reduced in size, with either frequent or no vomiting, belly flat, and tumor is rarely made out, perhaps more resistance to palpation in gastric region.

TREATMENT (simple ulcer).—Rest first, in bad case put to bed. To give rest to stomach give no solid food, milk is best, no oatmeal, bran bread, etc. If milk will not agree add Lime Water, which prevents curdling of milk into a mass which irritates, or mix milk with arrowroot or bread or flour for same purpose. If milk disagrees, give meat digested in a strong acid solution of pepsine, this is Valentine's beef tea, or peptonize any beef tea or milk, etc. Sometimes buttermilk will agree when other will not. Kermis (fermented mare's milk) will often agree. As stomach improves, add yolk of egg, or give unfermented bread or biscuit, then fish, then meat.

RECTAL ALIMENTATION.—Be content with 2 injections per day of temperature of 98, throw it in slowly. Hold napkin to anus for a couple of minutes after, or use a fountain syringe; let patient lie on left side, hips raised; attach elastic catheter, and shove up to sigmoid flexure; have reservoir not very high, so stream is slow and gentle. Give but little first day, and gradually increase. If you can keep patient on rectal alimentation for 4 to 5 weeks cicatrization of ulcer will have begun. One author gives dr. 4 Carlsbad Salt every morning in pint of water in 4 drinks before breakfast, it is to lower acidity of stomach, which irritates ulcer. Some use siphon tube to wash out stomach. Sometimes Morphia is given for pain, give with Bismuth. Chloral is also good, stimulates ulcer, is an antiseptic. Leeching may be needed over epigastrium, followed by ice bag and then Belladon. plaster. For hemorrhage no food by mouth, ice bag over stomach, small piece of ice in mouth. Give gr. 5 Ergotin every 4 hours hypodermically, or Gallic Acid, Pulv. Alum or Perch. Iron by mouth, or Turpentine. For stricture of ejuner orifice by cicatrization stomach has been opened and orifice dilated.

XLVII. DISEASES OF PANCREAS.

Hemorrhages may occur into pancreas in persons fat, perhaps in good health. Violent pain in epigastrium, syncope and death in $\frac{1}{2}$ hour to 36 hours. Looks like poisoning. After death you find copious extravasation of blood, pancreas may be otherwise healthy. Cannot be diagnosed. Inflammation of pancreas comparatively rare. Symptoms set in suddenly violent colic in epigastrium, which is distended and tender; vomiting, constipation, early collapse. Post-mortem shews enlargement of pancreas, either containing blood in excess, abscesses or in condition of gangrene. In hemorrhagic form death occurs in 2 to 4 days, and you find disseminated necrosis of fat; little masses from pin's head to hen's egg, looks like tubercle, are found in pancreas, subperitoneal tissues, etc. This fat is soft. In suppurative form often opens into duodenum or stomach, sometimes abscess extends to omentum—here there may be inflammation of portal veins. These cases may be subacute or chronic.

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may take weeks to kill. In gangrene pancreas sloughs, and this abscess may open into hollow viscus and escape. Only known cause of pancreatitis is from duodenitis. Hemorrhagic form not accounted for.

DIAGNOSIS.—No rules, but has been diagnosed. It is one of modes of sudden death. Treatment, palliative as with peritonitis.

XLVIII. VARIOLA, OR SMALL-POX

Is a contagious disease produced by a morbid poison, running a definite course, exhausting the system of the material required to sustain the specific virus. It is characterized by various stages, or can be so divided. There are two varieties, the discrete and the confluent, according as the eruption or vesicles in it keep distinct or run together. In rare cases "*Variola sine exanthem*" there is no eruption. There is also "*Variola Maligna*," a malignant form, and "*Variola Hemorrhagic*."

VARIOLA DISCRETA.—Symptoms of its 4 stages : 1. Incubation—the poison is latent while it is multiplying, till at last the disease is declared in the invasion or initial fever. The incubation stage varies according to entrance of virus by inhalation or by incubation,—if inhaled, 10 to 16 days ; if inoculated, 7 to 9 days. Extreme duration in all forms is 5 to 23 days. 2. Invasion or initial fever—terminates with the full eruption. 3. Eruption stage—begins with the appearance of the eruption and lasts till the beginning of second day fever ; generally begins on 3rd or 4th day, and then generally 4th stage begins with secondary fever, and comprises all the rest.

THE INVASION.—The symptoms resemble those of typhus, begin abruptly, chills are prominent early, patient is shivery, but a definite rigor is not as common as in erysipelas or pneumonia—more shivering than a rigor commonly. Pains are also complained of, the characteristic backache in lumbar region due to disturbance of the cord. Is very severe, and in majority of cases is the great complaint and in the groins. Headache accompanies, may be quite violent. There may also be pains in the extremities. Nausea and vomiting also now appear till vomit may become biliary. Nervous symptoms may also be marked, as drowsiness, stupor, sometimes delirium in bad cases, even insensibility. In children the vomiting is more marked, and there is more likelihood of brain affection, as drowsiness, stupor or convulsions. Indeed convulsions may be the first symptoms noted in invasions. Temperature rises rapidly the first day, 104 to 105 and except during slight morning remissions it remains high till 3rd or 4th day, when eruption appears. Eruption generally appears on 3rd day, as a few tiny red pimples, devoid of fluid, of size of pin's head—raised, forming papules like grains of shot—hard. Then little crops of these papules appear, separated by several hours. First crop is on wrists, face and neck, second on body, third on extremities. They continue to appear till end of 5th day. The eruption is then general. The fever is now abated, and patient feels convalescent. Look for the eruption where

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it should first appear. Thus first place on face is along *ala nasi* and sides of the nose, and on eyebrows. Bring patient into a good light, for first beginnings are small, and it is important to diagnose this disease early. Then look on fronts of wrists over the flexor tendons. When papules have been forming 2 to 3 days the congestion about each papule fades away. A minute vesicle is seen on apex of each papule on 3rd day of eruption. The vesicle enlarges, but being bound down by a bridle in centre becomes umbilicated. This takes place when vesicle is 2 days old. When vesicle is 4 days old it matures, and the serum becomes pus and the vesicle a pustule. An inflammatory ring at same time appears around each pustule. At this time the bridle ruptures, allowing the umbilication to become spherical. At 8th day of eruption a dark spot appears on apex of each pustule, skin here gives way, contents escape and scab forms. Between 11th to 14th day of eruption desquamation occurs, leaving cuticle a reddish brown, which color persists for some weeks. Often skin is penetrated by the pustule, causing loss of substance, hence pitting. 4th stage is that of secondary or suppurative fever, due to absorption of purulent material of pustule. Begins 8th day of disease and 6th of eruption. Face, head, neck, eyelids, etc., swell greatly, spaces between pustules inflame, get dark red, the deeper the color the milder the attack. In average cases this 4th stage of fever is proportionate to eruption. May have chills, fever smart, high, pulse frequent and delirium slight. In favorable cases this fever subsides in 2 to 6 days, also swelling subsides.

SYMPTOMS of 4th stage,—itchiness and tenderness of skin. Eruption appears on mucous membrane, on conjunctiva, mouth, fauces, throat, prepuce, labia; are firm, hard, whitish spots, no pus or serum. Fauces get much swollen on 7th to 8th day, there is salivation and deglutition difficult, voice hoarse. When pustules are maturing there is a faint, sickly, characteristic odor. If case be advanced and take unfavorable course face does not swell on 8th day (so swelling is favorable), space between pustules remains whitish or pale, pustules look red, and continue elevated. Perspiration, hitherto free, suddenly ceases; and secondly fever presents 1 of 2 forms,—either (1), like 2nd or 3rd stage of typhus, a typhoid state, brown tongue, pulse frequent and delirium; (2) in other case patient is overwhelmed by poison, sinks, pulse and temperature are not great. The patient becomes extremely restless, coughs, has frequent micturition.

CONFLUENT SMALL-POX is more serious, 50 per cent. fatal. Initial rigor and fever are more severe and shorter. Eruptions appear early, the earlier the more confluent—delayed eruption is favorable. Instead of slow and regular development of eruption, vesication or pustulation may be found on 2nd day. The eruption is often preceded by erythematous or petechial rash, a prodromial rash like scarlatina, measles, etc. The papules appear irregularly—like measles, in patches—are less marked as papules than in discrete form. The eruption stage having occurred, the fever does not remit so completely; pulse 110 temperature yet high, 106. The eruption is peculiar, papules flat and irregular; vesicles form rapidly, coalesce and form bullæ. Salivation is excessive. At 8th day this

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saliva grows viscid, and is expectorated with difficulty. In children diarrhoea may replace pytalism. The mucous membrane may inflame down to large bronchi, producing cough, aphonia—are dangerous symptoms. In 4th stage, patient is first endangered in 11th day by high fever, destructive, unless remedied by medicine. Then 14th to 17th day especially—are dangerous. In advanced stages, pneumonia, cardiac inflammation, meningitis, oedema glottidis, may be fatal. Unfavorable symptoms are paleness between pustules, face not swollen, no pytalism, cough, etc., a black spot in each pustule.

MALIGNANT OR BLACK SMALL-POX.—Hemorrhagic. Blood is altered, and extravasations occur into body with hemorrhages from all m. memb. Purpuric symptoms may be present from the first (is very fatal), or may occur during the eruptive stage. This form usually sets in without delirium. In 18 to 36 hours a prodromal rash—deep purple or scarlet—appears, sometimes macular or mealy, disappearing on pressure, coming out on lower part of abdomen or inner sides of thighs, or all over body except face. Rapidly petechiæ and large ecchymoses shew themselves, may get large. Conjunctivæ become suffused with blood, hideous black-eyes produced. Hemorrhages occur internally. Pulse may run high or not, ditto temperature, in fact temperature not usually high, but in bad cases temperature is very high just before death. Vomiting (bloody) is frequent. Urine is albuminous, followed by blood. Breath may be fetid from sloughing m. memb. Death may be on 3rd day or earlier, but 5th day is most frequent. By this time papules are few, shew themselves best on knuckles and toes, do not run to vesicles, but abort into firm, flat tubercles. This form is never met with in vaccinated subjects under 15, or in those re-vaccinated above that age. Hemorrhagic symptoms may not develop until after eruption, appearing between papules. Is more protracted, but just as fatal as other form. If patients get up, the legs get hemorrhagic, so do not confound with true hemorrhagic cases.

COMPLICATIONS OF SMALL-POX.—Ulceration of cornea, extending rapidly, leading to perforation, may occur as late as 30th day. Watch for it, as it must be actively treated. Oedema glottidis, serious, leads to asphyxia. If he escape this, cartilage of epiglottis may necrose. Bronchitis, pneumonia (catarrhal), pleurisy, 11th day, setting in very suddenly, and effusion becomes pustular. In severe cases we get albuminuria, in $\frac{1}{3}$ rd of all cases, with hæmaturia in hemorrhagic form. Orchitis, inflammation of ovaries, renal abscess and central hemorrhage are rare. A pregnant woman in severe cases is almost certain to abort; is very dangerous.

RECOVERY.—Course of disease being run may be retarded by boils appearing in all parts of body, or abscesses, or erysipelas, chiefly facial, hydrarthrosis, even pyarthrosis, bedsores. Otitis, caries of temporal bone may occur. Severe pitting in face, the cicatrices may become keloid, producing deformity. Anasarca general, not as common as after scarlatina. Developments of scrofula, phthisis, etc., are apt to occur. Suppuration in eyeball may occur. This is really

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pyramic, like the boils, abscesses, pyarthrosis, etc. Gangrene of extremities is rare—toes, fingers. Paraplegia due to circumscribed dissemination of myelitis or encephalitis are observed.

P. M. CHANGES differ in the different forms. Skin lesions, etc., are of course found, specific pustules, purulent, infiltrations. Catarrhal or membranous inflammations on m. memb., especially those exposed to the air. Pustules are not found in serous memb. or stomach, intestines, bladder, urethra, but do occur in vagina and rectum. Liver may be granular, heart fatty, spleen swollen and soft early in disease. If patient dies early by purpuric form few changes found.

IMMUNITY FROM SECOND ATTACK.—Germs consumed all the pabulum suited to their growth. It is probable the acquired resistance is transmitted to offspring, hence reason Indians and Negroes so suffer, not being so protected. In time resistance wears out, pabulum accumulates.

EXCEPTIONS.—Like other exanthems—immunity is conferred by first attack, but one man had it three times, a lady seven times, a certain surgeon took it every time he attended a case. Some persons seem insusceptible.

ETIOLOGY.—Is ancient disease, probably originated in animals and spread to man. It is propagated by its own virus, through air by inoculation, as through fomites, etc. The infection is given off by lungs, skin, secretions or excretions. The perspiration is especially infectious, blood also. Time of infection dates from as soon as the fever is developed, some think even during incubation (doubtful). It is most virulent when vesicles are becoming pustular, others say when odor is strongest. The dead body is also infectious. The infectious distance is many yards, greater than in any other disease; it may spread from one house to another through several feet of air, and may be floated further by wind.

PREDISPOSING CAUSES.—Early age, but any age may take it. Non-immunity from a previous attack or vaccination. Idiosyncrasy, fear, epidemic influence.

TEMPERATURE OF SMALL-POX.—Initial fever on 1st to 2nd day, 104 max., but it may increase in 3rd to 4th day. Remissions are slight. On eruption temperature falls from 4th to 6th day, but not to normal, keeps moderate for several days. At maturation temperature again rises 102 in moderate cases, higher in severe. There may be now low remissions.

DIAGNOSIS.—Measles and chicken pox. Measles—at outset you get catarrhal state nose and eyes, and temperature never runs up so high at first. On 2nd day a marked remission of temperature occurs, two days slight fever, then a rise, different from small-pox. In small-pox temperature abates after eruption, increases in measles, nor are spots so large. In measles eruption comes out at same time on face and back, different from small-pox. Eruption in measles appears in 4th day, small-pox in 3rd day.

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CHICKEN POX.—Eruption appears on 1st day of invasion on back and afterwards on face, is not so shot like, becomes vesicular earlier, does not become umbilicated, is not surrounded by red areola, but does have a distended erythematous blush. Vesicles dry before pustulation, scab, do not pit. There will be several stages of eruption at same time, shewing it comes in crops, which last 4 days.

TYPHUS FEVER.—Resembles strongly at outset, impossible in first 3 to 4 days to diagnose sometimes. Temperature gives no help, but eruption of typhus is mulberry blush, disappearing on pressure. Subsequent course of disease is plain.

PROGNOSIS.—Experience gives good indications. Danger is increased in early and advanced age. Under 5 and over 50 there is a mortality of 50 per cent., between 10 and 15, 25 per cent. die. Confluent cases 50 per cent. die, all malignant cases die, children under 1 year die. The greater the eruption the greater the danger, purpuric conditions are unfavorable. Delirium especially if early is unfavorable. Laryngeal and tracheal involvement are bad, pregnancy is unfavorable. Unsanitary conditions, as non-ventilation, are bad. High temperature is bad. During secondary fever if temperature is over 104 for several days is bad. If primary fever lasts over 4 days case is severe, poorly marked remission ditto.

VARIOLOID (modified small-pox).—A slight continuous fever lasting 2 days with slight eruption, sometimes only one pock. Initial symptoms may be just like small-pox for 48 hours, and then succeeds the trilling eruption, hence difference. The eruption may appear on 2nd day, earlier than small-pox, is preceded rarely by erythema, etc. It is rare for pocks to be close enough to be confluent. In varioloid all stages of eruptions may be present together. Few pocks are regularly formed. Not umbilicated, no order, no secondary fever.

TREATMENT.—No specific treatment, disease will run its course. Moderate the pustulation, obviate inflammations, keep up strength, relieve special symptoms. In mild discrete cases, leave case to nature, will issue favorable. At outset give mild purge, then give cooling drinks, acidulated lemonade, etc. Cold water, ice, etc., is allowable, also fruit in moderation. But see patient has large, airy room, keep him cool, not cold, so do not heap on clothes, have room ventilated by open window, temperature of 60. Diet is fever diet, sago, milk, broths (light). In severe cases nursing is important, must be good, especially if there be delirium, do not leave patient delirious. During primary fever give purge, as Pil. Coloc. or Mag. Sulph., and afterwards keep bowels free by mild laxative as Pulv. Grey. Delirium in first stage calls for cold to the head or hot foot bath. Give full doses of Pot. Brom. till this state is reduced. Shrunken features with delirium calls for supporting treatment, high fever calls for Antipyrine or Antifebrine. Sod. Salic. is also used, frequent sponging is very good. If case is confluent cut hair short at once. If primary fever does not subside, Sod. Salic. or Am. Carb. or black draught is called for. Sleeplessness at 10th day needs Opium, etc. If there

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be much salivation do not use Opium. Restlessness may be allayed by keeping patient in hot bath or hot packs. Occasional application of vaseline to surface is very good. Mania may appear, needs Chloral.

ANTISEPTIC TREATMENT.—Ac. Sulph. Dil. m. 5 to 30. The Hyposulphites, Sulphites and Ac. Carb. have also been used. But experience proves that bacilli are not easily destroyed by any means. In advanced stages of secondary fever stimulants are called for. Mineral acids are also very useful. A dirty tongue and dry, a weak pulse, and cold extremities call for stimulants of all kinds.

PLANS TO PREVENT PITTING.—Black recommends exclusion of light and giving of Arsenic—should only be employed in modified forms, so is not of much use. In hemorrhagic cases cold water is only of transient value. Styptics are no use. Quinine also failed.

TREATMENT OF ERUPTION.—Keep off irritation as much as possible, keep purulent matter as pure as may be. Cod and Olive Oil are used on surface. Glycerine and Rose water are used after pustules have broken. Hebra recommends cold water compresses, but they do not modify the eruption. Ac. Carb. 1 part, Glycerine 20 parts, may be used twice daily till desquamation. Watch urine lest the Ac. Carb. poison. Do not discharge patient till scabs have gone from surface and he has had 6 baths with 2 days between each.

VACCINATION, VACCINIA, COW POX.—At site of introduction on 3rd day a papule forms, which on 6th becomes a vesicle and on 8th is perfect and umbilicated. An areola then forms, and lasts 2 days. This areola is important, shewing vaccination has acted constitutionally. Hot skin, restlessness, swelling of axillary glands, papular eruption, or vesicular, appears on extremities, and lasts a few days. On adults the areola is more diffused and the effects take longer, and the local effects are more severe. Irregular course of vaccination—vesicle may be delayed for several days. The papule or vesicle may be on 5th or 6th day and leave a yellow scale or scab. More frequently the vesicle becomes conoidal and contains a yellow fluid, and may burst on 8th day. You may get what is called a raspberry excrescence raised above skin and slow in appearing. There will be no areola, it resembles a naevus. It becomes hard, black, and withers away. There may be absence of constitutional effects, but you cannot then affirm there is protection against small-pox, for you must have both local and constitutional effects. The vaccine lymph should be collected on 7th to 8th day from normal poeks. Take it from a healthy child of 7 to 8 months, whose parents you know. Vaccinate early if child is healthy. To prevent spread of small-pox, which is easily controlled disease, revaccinate the healthy and isolate the sick. Infected linen must be steeped in Ac. Carb., then washed, boiled and dried at a high temperature.

XLIX. VARICELLA (CHICKEN POX).

Its chief importance is in diagnosis from modified small-pox. Its name is from chick pea, hence corruption. Disease was recognized in 1730 as differing from small-pox. Proofs varicella is not variola: 1. It occurs in vac-

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inated persons. 2. In those who have had small-pox. 3. Those who have had chicken pox are not protected against variola. 4. Inoculate fluid from pock of variola and you get small-pox, but if from vesicle of varicella you get no success from inoculation, or if successful it gives varicella.

THE ERUPTION appears as a number of small pointed red spots, not papules, with no general disturbance of system. The spots look like typhoid spots. These points in a few hours develop into vesicles, are size of split peas. They either have a red (blush) base, or else vesicle is on natural skin. These vesicles look like large drops of water, are clear, scattered over body, occasionally clustered like patch of herpes, are very superficial, and have no thickened floor or base like in variola. They are round, hemispherical and not umbilicated. Puncture and vesicle collapses. After a while the serum becomes opaque, but does not form pus. 12 to 24 hours vesicle becomes dry and flaccid. The majority of vesicles are ruptured from scratching, hence little brownish yellow scabs, which, dropping off, leave red spots. In some cases little pocks are left. Eruption appears rare on face first, but rather on chest and between shoulders first. Is present on scalp, and after on arms and legs. Comes out in crops during 3 to 7 days. Spots may be few, perhaps 10 to 200 on whole body. They appear on muc. membs. as on palate. On lips they burst early, and leave what look like little ulcers. Rarely vesicles run together, hence bullæ like in pemphigus. Constitutional symptoms are almost nil. Temperature about normal. Incubation is doubtful, 4 to 27 days, a week perhaps is its time. Disease occurs in children rarely after 10 years, exceedingly rare in adults. It is possible, but rare, to have second attack.

TREATMENT—Light diet, no medicine, protect spots from scratching, especially on face.

ISOLATION.—Disease is so mild that it is not necessary to practice strict isolation. Ill effects are exceedingly rare.

L. SCARLATINA.

FORMS.—S. Simplex, S. Anginosa or Ulcerosa, S. Maligna and S. Latens.

SCARLATINA SIMPLEX, without sore throat, is mild, even not taking to bed, incubation varies from a few (3) hours up to 7 days, the average is less than 3 days.

PRODROMATA, chilliness, shivering, and in young children often convulsions. Languor, pain in limbs, then reaction, fever, high temperature and high pulse, frequent vomiting and purging. The rapidity of invasion is diagnostic. On first or second day, *i. e.*, at end of 24 hours there is a rash.

THE RASH is a bright red efflorescence, consisting of numerous small bright red spots on white skin, then skin between spots soon gets red, and redness is general and skin is like boiled lobster. It, as eruption is on decline, gets darker. Eruption may be smooth or rough. The redness appears deeper at night, disap-

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pers on pressure. Scrape nail along skin and you get a persistent (1 to 2 min.) white line from excessive contractility of capillaries. Rash is most prominent in flexures of the joints and on covered parts. Appears first on face and neck, upper extremities, and in 12 hours covers trunk and legs. Occasionally it comes out over whole body simultaneously, no eruption of any other disease appears so rapidly. Occasionally vesicles are seen, eruption remains at height for 24 hours, and on fourth day declines face, neck, and arms, on fifth from trunk, and on seventh day disappears. The fever is unaffected by appearance of rash, and ceases by lysis by its disappearance. In this form there is slight redness of throat and fauces. Some trace of sore throat will be found, even a day before the seizure. Eyelids, lips and edges of tongue and nares are redder than natural, diagnostic. The papillæ of tongue project, so tongue looks like unripe strawberry, but in some cases whole tongue is red like a ripe strawberry. Cuticle peels off as rash ceases, separates in scarf form from face, but in layers from palms and soles. Desquamation may begin at fourth day and takes about 6 weeks to be complete. The newly formed cuticle may desquamate again, and the next too, and even then be infectious, so as late as ninth week may be fraught with danger. About sixth day albumen appears in urine, with renal epithelium. In some cases there is redness of fauces and suspicious tongue, but no disturbance of general health till fifth day, when eruption occurs. Is rare and a mild form, a variation. Pulse will be frequent and very compressive. A common form is for rash to appear same time as invasion.

SCARLATINA ANGINOSA.—Throat especially attacked, and rash one day late often less copious and less diffuse than simplex. May be patchy or confined to, one part, as arm. The fever is more violent than in simplex, and severe vomiting, restlessness and delirium may set in on 2nd day and perhaps from outset. Temperature is higher, 105. Pulse frequent, 140 to 150, weak and fluttering. The throat symptoms may precede the primary fever, but commonly accompanies the eruption—may occur at a later day. The tonsils become enlarged and ulcerated, the uvula and pillars of fauces are red and swollen. In severe cases fauces become closed by the swelling, hence dysphagia. Glands at bifurcation of carotids and the submaxillary glands enlarge. Larynx may be involved, hence hoarseness. Degeneration. Fever is in proportion to throat affection, does not go down till throat is healed. As sloughs separate fever reduces, but does not cease till throat heals. Hematuria, erythema, etc., may occur.

PROGNOSIS.—Bad cases die in 18 hours, may die in 3rd week.

SCARLATINA MALIGNA has 2 chief forms—ataxic and adynamic. Ataxic form,—disturbances of nervous system predominate, agitation, restlessness, delirium. The rash comes out well, throat very sore, fever very high. Delirium persists and is of active form, looks like an acute meningitis. In a couple of hours typhoid symptoms appear, tympanitis and death. Adynamic form,—vomiting and purging incessant, child may turn pale and faint, may be slightly delirious. In very few hours extreme depression occurs, pulse 170, external temperature

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feels cold. Faint rash may appear, but weakness is the great symptom. It may be fatal in 12 hours, convulsions. There are cases intermediate between these two types. The rash in malignant form is late, so you like to see rash early; is livid, and so you like to see a bright rash—disappears and appears again in a few days. In worst cases no rash appears, kills too soon.

SCARLATINA LATENS may have no sore throat or rash, but dropsy appears. This dropsy is more fatal than after ordinary cases. Albuminuria and hematuria without dropsy may be only evidence of scarlatina, but when either appear and scarlatina be present, then suspect it.

TEMPERATURE OF SCARLATINA.—In mild cases no elevation is seen before eruption; in other cases in few hours 103 to 104 is quickly reached, rising slowly afterwards to 104 to 105–108, or may just remain high. In either case remains till rash is at its maximum, then it declines slowly by lysis, requiring from 3 to 8 days for completion of fall.

SORE THROAT is present in every form, so is marked symptom. The throat is first part attacked, and often is last part to recover. Simple sore throat is rare in children, that is inflammation of fauces, although tonsillitis is commoner. If sore throat is accompanied by enlargement of neighboring glands suspect diphtheria or scarlatina, and isolate; regarded as infections. Urine in S. is scanty and remarkably febrile, loaded with lithates, with perhaps albumen till 6th to 7th to 7th to 14th day, after that it increases in quantity, more uric acid, etc. About 14th to 15th day, urine gets abundant, neutral, pale. Sometimes in early stages no albumen, a mucons cloud appears in urine of epithelium degenerated from a renal catarrh. This catarrh is usually mild, declining with eruption, but may continue and pass into more serious disease of 3rd week. This renal catarrh is found in measles, etc., but more frequently in scarlatina than in any other disease.

COMPLICATIONS.—Coryza, nasal tone of speech, nasal discharge, is frequently found, especially in cases with pharyngitis. Otitis media common especially with coryza, or severe sore throat, beginning in early stage and tends to formation of pus in middle ear, perforation and escape of the ossicles. In severer cases the tympanic membrane may be destroyed, mastoiditis, caries of temporal bone, etc. Otorrhea is rare, occasionally due to inflammation of external meatus, occurs later in disease. Eye rarely suffers. Keratitis with perforation may occur, amblyopia and retinitis are rare. Scarlatinal bubo of cervical lymphatics, and axillary glands too grow tender and enlarge, but subside on decline of the angina. In other cases, at end of 2nd week glands enlarge rapidly, fever returns, and inflammation may invade the surrounding cellular tissue, hence brawny induration ending in deep and extensive suppuration from ear to ear, killing by exhaustion, asphyxia, œdema glottidis, hemorrhage—all very dangerous. Cellulitis, post pharyngeal, leading to post pharyngeal abscess, is also met with. Sore throat which sets in with eruption attains height at 6th day. Although severe it usually gets well. But later on, at 8th to 10th day to end of second week, a second sore throat may appear, is a real diphtheria, concurrent, very fatal. The ulceration

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extends wide and deep, foetid discharge, glands enlarge, etc. Is often called *angina maligna*. Pulse in these cases is exceedingly small, death by syncope.

AFFECTIONS OF JOINTS.—Scarlatinal rheumatism. At disappearance of eruption, joints of fingers, wrists, knees, etc., may become swollen. Pyrexia returns and illness is prolonged. A single joint only may be affected, not common—synovitis with effusion is marked. Destruction of joints by suppuration may occur, probably a pyæmia, fatal generally. May have endocarditis, pericarditis.

INFLAMMATION OF SEROUS MEMBRANES.—Probably produced by two conditions: 1, as in *S. rheumatism*; 2, or as in *albuminuria*. Pleuritis is most frequently of renal origin. Peritonitis may occur. Products of such effusions speedily become pustular. Endocardial murmurs (from valvular lesion) may result, scarlatina being a cause in early life.

DROPSY occurs in 5 per cent. of cases. Circumstances may make an epidemic go 70 per cent. Is most common after mild attacks. Likely to occur as late as 22 days in convalescence, and even several months have intervened. This dropsy is preceded by *albuminuria* 1 to 2 days, but occasionally this is reversed. In rare cases, dropsy remains after *albuminuria*. Some cases resemble tubular nephritis, with fever, anasarca, urine of high color, high specific gravity, abundant albumen, deficient of urea, chlorides and often blood. Mild cases have no fever generally comes on at end of 3rd week, due perhaps to constipation or fever, may be very mild. Anæmia is rapidly developed. Scarlatinal dropsy occasionally proves fatal, even in a few hours, as by effusion (rapid) into both pleuræ, or by convulsions or by coma. (Edema glottidis, bronchitis, laryngitis, pneumonia, periostitis, muscular abscesses, caries of cervical vertebræ, paralysis of single nerves, aente dilatation of left ventricle, are all rarer, and disorders of the nerves.

ÆTIOLOGY.—Is due to specific contagion, propagated by contact, by air, by fomites. It surpasses all other contagia by tenacity to articles, by its transportability, viability, as held in clothes, transmission by letters, etc., hence care needed in disinfection. It is not infectious before throat is sore. As long as throat is congested (long after desquamation) it may be infectious. The desquamating skin, evacuations, etc., are contagious. All through desquamation it is contagious. Previous attack protects, but if greatly exposed you may get a specific sore throat capable of transmitting the disease. Dr. Mahomet says all persons are contagious till end of 8 weeks or 6, hence length of quarantine—6 weeks is a good average. It is infectious as soon as primary fever occurs. S. F. is inoculable, but is just as severe. Disease occurs at all seasons and ages, mostly at 3rd or 4th year; it may be inoculated, but disease is no milder. Pregnant woman may infect fetus, or not. The poison may be conveyed by milk: a convalescent woman milking cow may infect the milk. The cow itself is subject to a disease which produces scarlatina in man, probably the same disease. The pure milk is innocuous, but during milking it gets the contagion from the ulcers on the teats.

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MORBID APPEARANCES.—Inflammatory alterations found in kidneys, liver, spleen and lymphatics, tonsils, lymph follicles about fauces and throughout intestines. Skin also affected. Alterations are hyaline degeneration of elastic tissue of arteries. Germination of muscular coat of arteries. Parenchymatous degeneration. Interstitial inflammation. Hyaline and adenoid degeneration of lymphatic tissue. In kidney there is also interstitial change, glomerular nephritis, capsule filled with cells. Scarlatina cannot be aborted.

TREATMENT.—Aim is to secure moderation of symptoms. In every case moderate febrile symptoms by tepid 77 to 76 degrees sponging, covered less as temperature declines. Anointment of body by vaseline, olive oil and butter, etc., over whole body night and morning allays itching, restlessness. Mild febrifuges dr. $\frac{1}{2}$ Liq. Am. Acet. 4 q. h. and Citrate of Potash. Plenty of liquids may be allowed. Am. Carb. is given in anginosed form, useful when prostration is appearing.

TEMPERATURE is high, needs antipyretics. For 103 to 104 do not use unless there are nervous evidences of poisoning, then use Antifebrine grs. 3 to 5, and same of Quinine, or Antipyrine, gr. 15 adult. Quinine is not much used now. Digitalis is also useful in some cases, and carry on the sponging, or the wet pack may be used. In such cases anoint after drying surfaces and then cover the body lightly. Keep room well aired and cool. Ice bag to head is good in malignant cases, child in bath at 88, and give stimulants. Nourishment in these cases must be abundant, also stimulants.

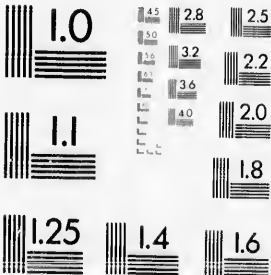
LOCAL COMPLICATIONS TREATMENT.—Sore throat, suck ice, gargle with coll water and Na Cl. or Pot. Chlor. Inhalation of steam is soothing. If about 4th to 5th day ulcers are not healing, spray throat with Tr. Fe Cl $\frac{1}{2}$ oz., aqua ad 8 ozs. or Ac. Carb. m. 4 to 1 oz., or Pot. Chl. 2 dr., Ac. Carb. dr. $\frac{1}{2}$, Glycerine 1 oz., is good spray; and add Lime Water 8 ozs. If breath is fetid use local disinfectants as gargles of sol. Carb. Ac. 1 per cent., or Condy's Fluid dr. 2 ad 1 pint, and Permanganate of Pot. 10 gr. to 1 oz. In children who cannot gargle, spray. Nostrils need some attention, sol. Boracic Ac. to prevent septic absorption. In diphtheritic throat, will treat it under D. For neck swellings apply hot fomentations, or in early stages use cold applications. Once swelling gets brawny medical treatment does it no good, sustain patient by iron, wine, etc., and incise. Otitis media, always watch for it with speculum daily. *Treat,* as Dr. Buller says.

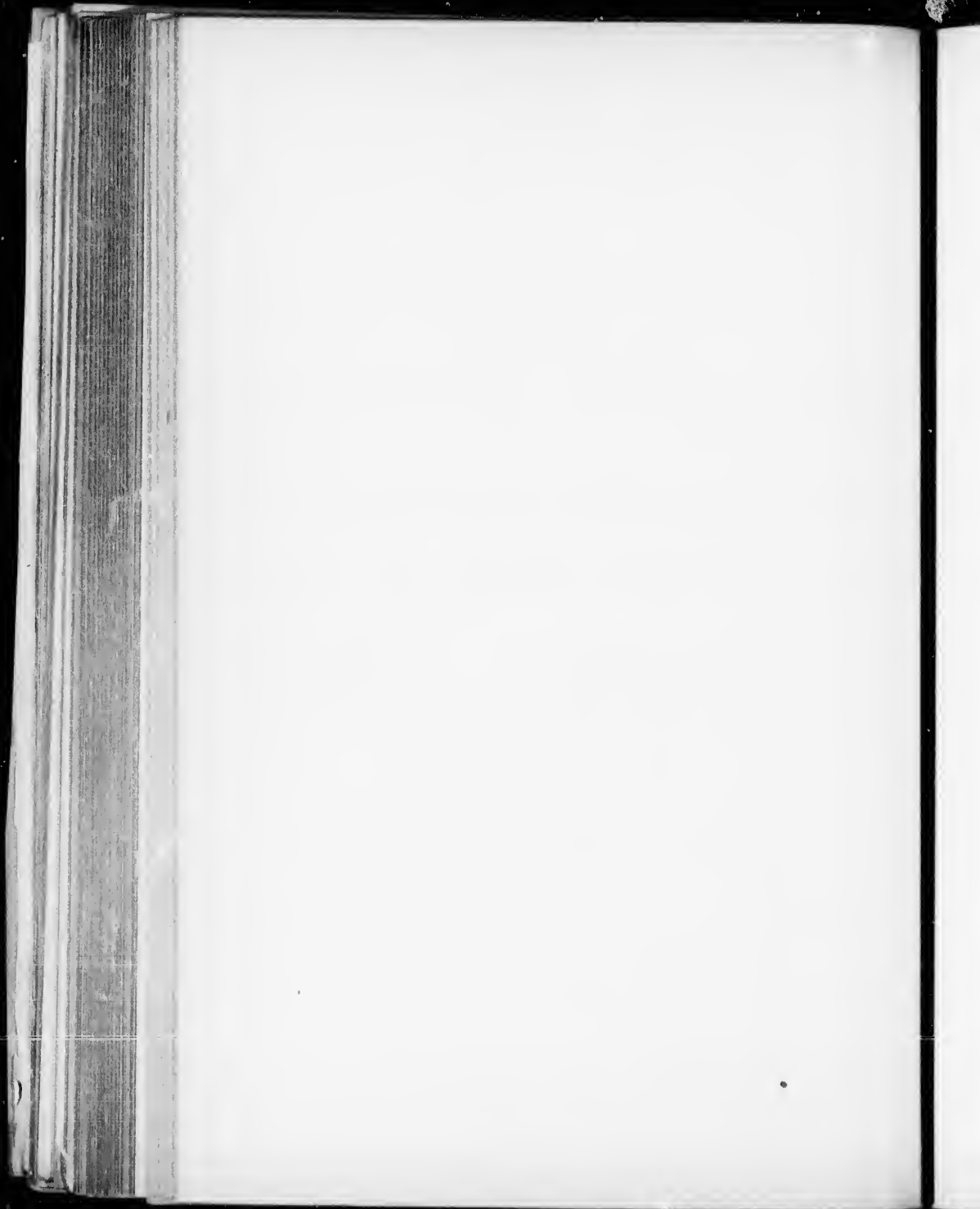
DROPSY if severe will yield to low diet of milk, hot baths, diaphoretics, as Ant. Tart. gr. $\frac{1}{2}$ th to $\frac{1}{4}$ th, or Pilocarpine and purgatives as Pulv. Jalap Co., or Scammony, or Jaborandi, also locally large hot poultices over loins. Keep body in flannel to keep skin active. Cupping, dry or wet, over loins may be needed. Mild cases if discovered early will often yield to a hot bath or brisk purgative. Some give Digitalis, and lots of H₂O to drink. In children, Inf. Dig. may be given in almost as large doses as to adults. Urine has been, in bad cases, suppressed for 9 days with recovery. Convalescent dropsy—use iron for



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)





anemia, as Fe. Am. Cit. or Fer. Red. Use Pilocarpine carefully with children, or dr. $\frac{1}{2}$ Ext. Fld. Jaborandi for a child. To lessen infection wash patient daily with carbolized water. Let all in the house wash themselves daily with carbolized water, so use carbolic soap. Hang Chloride of Lime towels in the room, hang ditto sheet over door. Isolate patient from family for 6 weeks. Disinfect urine and feces in sol. Chloride Lime or Ac. Carb., ditto all bed clothes, bed linen, etc., before leaving room. Real scarlatina often occurs after surgical operations—a surgical scarlatina. It commences more suddenly than ordinary scarlatina, appears within six days generally after operation or parturition. Throat is but little affected. Cicatrization of wound may be delayed; as general rule patients recover. Some think this bright rash is due to septicaemia not to scarlatina. This is often seen in puerperal septicaemia, so all cases are not scarlatina. Condition of surgical patient in inflammatory fever is favorable to attack of scarlatina, hence keep scarlatina away from surgical wards.

II. MEASLES, (MORBILLI RUBEOLA).

Morbilli means a little plague. Rubeola is little used as a name. Measles shews various forms, as morbilli mitior, or gravior, or sine catarrho or sine exanthemata, etc.

INCUBATION.—Poison latent, but occasionally has languor, etc. Incubation is 6 to 16 days, average 14 days. When inoculation, incubation is 7 days.

INVASION may set in suddenly, but more commonly is preceded by symptoms of common cold. Febrile symptoms are never very severe, no overwhelming by the poison. There is shivering, flashes of heat, ss. constipation or diarrhoea rarely, sometimes nausea or vomiting, in children convulsions rarely. At end of few hours pyrexia becomes continuous, and remissions and acute catarrh is noted, running of nose, conjunctivæ suffused, no smell, inflamed throat, etc.

COUGH is dry, hard, and paroxysmal. Voice is roughened from larynx being implicated. Symptoms are more marked at night, continue 2 to 3 days, ss. dyspnoea. Now rash appears with increase in temperature. Primary fever lasts 3 to 4 days, rarer 5 to 6 to 9 to 10 days, till rash disappears, but eruptions have appeared at end of one day.

ERUPTION.—On 4th day rash appears as minute red points like flea bites, enlarging to size of hemp seed, disappearing on pressure. Papillæ are most marked on face. Soon the papillæ run together, forming clusters more or less concentric. Between those patches skin looks healthy. These patches are rough to touch, of deep rose red color—brighter the higher the fever. Often eruption is papular in young children, and in them even vesicles may be found. These vesicles are found on arms, breasts and neck—are not common. Eruption is most abundant in face, producing tumidity of face, swelling. Eruption follows order of small-pox in appearing, face, neck and upper extremities, fauces and throat, then on trunk, legs, and last of all on back. Crops may appear for three days,



take 24 hours to begin to decline, disappearing on order of appearance, only not 3 to 4 days, leaving a coppery mottling. In some cases eruption is partial only on face and limbs, etc. Eruption over cuticle desquamates at 8th to 9th day in small flakes, taking 4 to 5 days. By this time catarrh has ceased to attack, and the disease is over. Desquamation may last longer, and in slight cases does not occur at all. Is very rare in fingers and feet, differing from scarlatina. The eruption appears in mouth, affecting hard and soft palate, fauces, uvula, which present a red punctuate appearance, speedily becoming confluent and not disappearing till skin eruption fails; even appearing twenty-four hours before skin eruption, hence valuable in early diagnosis, also valuable in Negroes. On appearance of eruption fever and catarrh increase. Fever is at maximum on 5th day generally. Nausea, etc., often cease when rash appears. About 6th day (in mild) or 8th day (in severe), fever and catarrh abate and convalescence sets in 9th to 10th or 11th day.

TEMPERATURE.—Maximum is 5th day, rarely exceeds 103, but may in severe cases. Maximum is at once followed by a falling of temperature, even 2 degrees in one night, decreasing during following day, and in 2nd day from beginning of defervescence normal temperature is reached even in 24 hours.

SEVERE FORM malignant, is rarely seen at present day. Was called black measles, very fatal, also called hemorrhagic or malignant. Greater weakness is noticed early, nervous symptoms, stupor, delirium, etc. Eruption is apt to be delayed, may seem to disappear, perhaps not in regular course of appearance, and it suddenly may become dark purple or black, interspersed with petechia. There may be vibices or internal hemorrhages. Abdominal and catarrhal symptoms are like malignant typhus, are characterized by intense congestion; death occurs early.

COMPLICATIONS OF MEASLES vary with type of epidemic. Catarrhal laryngitis not uncommon during eruption it occurs, and may even occur during primary stage. Capillary bronchitis, pneumonia lobar or lobular gravest complications. These are very formidable. They appear during or just after eruption, and are to be most dreaded in the scrofulous, ill-nourished or very young infants. They always prolong and aggravate the fever. Acute military tuberculosis occurs in decline of eruption, affects lung or brain, is fatal, attacking lungs and meninges. Is oftentime a sequel rather than complication.

EYE.—Keratitis, iritis, phlyctenulae, etc.

EAR.—Catarrh of tympanum, often not painful. Intestinal catarrh, producing diarrhoea, is common at outset, may in some epidemics be serious. This diarrhoea is sometimes a dysentery. Diphtheria is rare in measles, but does occur. It appears at height of eruption, or soon after. Noma occasionally attacks mouth or vulva, is severe and formidable, very rare. The ill-nourished children are liable to it.

SEQUELÆ.—Complications may persist or may arise after measles also. Bronchitis may become chronic. Laryngitis, diarrhoea and eye and ear affections

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ditto. Asthma and emphysema affections, sequelæ. Cronpous pneumonia recurring, tuberculosis, enlargement of tonsils and other glands, otorrhœa, serofula. Dropsy is rare. Bone disease in the serofulous.

ÆTIOLOGY.—All seasons, but winter most; both sexes are equally liable. All ages, children, adults have severer attack. Is due to contagion propagated by inoculation, fomites, milk, tea, air. Exhalations from lungs, skin, etc., contain virus. It is virulent at all stages. Immunity is given by one attack. Three weeks from time of eruption ends quarantine. Differential diagnosis, scarlatina, rothela, roseola.

MEASLES.

Inubation 6 to 16 days.
Eruption 3rd to 4th day.
Character of eruption, crescent-color.
Desquamation fine.
Throat, rash early.

Catarrhal symptom—fever at max.
on 5th day. Redness with eruption.

Desquamation, brownish scales not on
hands and feet.

Sequelæ differ—bronchitis, pneumonia.

SCARLATINA.

3 hours to 7 days.
2^d day.
Boiled lobster color. Skin colored.
Treat points of color.

Anginoid symptoms,—max. at 3rd to
4th day, and may last days and weeks
after eruption.

Is in large sheets off hands and feet.

Otorrhœa, dropsy, rheumatism, gland
enlargements and gangrene.

TREATMENT.—Guard against exposure, and treat chest symptoms—no drafts, but yet good ventilation—keep the room dark for the sake of the eyes.

DIET.—Liquid. For cough give mucilaginous drinks, linseed tea, elm bark with expectorants. For dryness of the surface add Liq. Am. Acet. or Am. Carb. Linseed poultices where there is soreness. For tightness of the chest, mustard poultice, inhalations of steam and vinegar for hoarseness. Treat pneumonia and bronchitis, remembering stimulants need to be early resorted to and good nourishing food. Use opiates with caution, they ask for it for cough and sleeplessness, but do not arrest expectoration.

LII. RUBEOLA, OR GERMAN MEASLES.

Sometimes so resembles measles that they cannot be distinguished, other times looks like scarlatina, some call it a hybrid between the two.

SYMPTOMS.—Occurs in persons who have had scarlatina and measles, and this accounts for people saying they had measles twice, which is rare. It may be preceded for several hours or 1 day by prodromal symptoms, as pain in the head, back and limbs, slight fever and slight sore throat. Sometimes there is coryza, conjunctivitis, but only slight, not marked like measles; fever may be absent throughout, or only slight through eruptive stage, ceasing with it; oeca-

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sionally vomiting at beginning. Rash comes out rapidly in few hours to a day from invasion. Sometimes a child will come home from school covered with it, with no sign before going to school. It affects the scalp and face first, becoming general in two days. Apt to be confluent and bright on face. It fades from the face while it is appearing on arms, lasts 4 days; rash generally is bright and copious, sometimes is very bright—commonest color is rose red, hence it is called rose rash. Eruption is of rose red papules closely packed together, cannot make out crescentic shape like in measles, disappear on pressure. It may be as bright as scarlatina, occasionally there are milium vesicles, so from eruption alone it is hard to tell from measles. Enlargement of cervical glands is early, those below the angle of the jaw are often not enlarged. Enlargement of the occipital glands early, is almost pathognomonic. There is slight soreness of the throat and redness across it like the beginning of scarlatina, but never gets bad—no ulceration, only congestion. There is no eruption on the fauces as in measles. Suffusion of the eyes, cough, etc., is present often, but these symptoms are very slight. The fever declines with the rash. The rash lasts an indefinite time, generally 4 days, may be longer—8 to 10 days, and very rarely there is slight brawny desquamation. Urine generally normal, no albumen. No sequelæ as a rule, occasionally general debility is succeeded. The swelling of the occipital glands and enlargement of the tonsils may persist. The disease is contagious and occurs in epidemic. Stage of incubation—6 to 20 days. It is mainly a child's disease—one attack protects from a second as a rule. Malignant cases are described, but are rare.

TREATMENT almost nil, put in quarantine, give mild saline febrifuge—for cough or sore throat treat as ordinary.

LIII. DIPHTHERIA.

Seems to be allied to scarlatina, called Angina Membranea by old writers. Disease was noted in Europe in the 16th century and then described. It is divided according to its severity into: 1. Mild or catarrhal form, 2. Inflammatory or severe form, generally croupous, with or without distinct laryngeal symptoms, 3. Laryngeal or nasal form, 4. Malignant or asthenic form.

MILD FORM.—In some cases patient suffers little, is but slightly feverish, 99 to 100; only complaint may be dryness of the throat with slight pain on swallowing. Examination of the throat—looks bright red with slight swelling of some parts. Some axillary glands, and those at the bifurcation of the carotid, are swollen and tender. Some hours after, greyish white or whitish yellow spots appear on the tonsils or elsewhere, gradually enlarging. This form often goes no further, and is overlooked, the sequelæ only telling of it. On the 4th or 6th day it may pass into the severe form, but usually these severer symptoms subside in 24 hours, and convalescence begins.

INFLAMMATORY FORM.—Croupous or grey local diphtheria. Is called the croupous form by Germans, to distinguish from the mild catarrhal form. Constitutional disturbances are greater, headache, chilliness, vomiting, etc. Early rise of temperature and a very rapid pulse, with often great drowsiness and restlessness

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and early prostration. The earliest complaint is of the throat, which is hot, dry and sore, pain on swallowing, neck feeble, stiff and sore. Uvula, fauces and tonsils are red and swollen and œdematous, sometimes though look dry and polished. In a day the 2nd stage appears with yellowish patches, generally first on the tonsils. These patches speedily become opaque, altered in color, more grey, extend rapidly, coalesce, covering quite an area. The exudation thickens. Glands at the angle of the jaw and bifurcation of the carotid enlarge and become tender. Case may go on thus, either: 1, process may cease, temperature fall to normal at 4th or 5th day, and symptoms improve, and on the 7th to 9th day case declines; or 2, constitutional symptoms may assume a septic form, very dangerous. These septic symptoms generally come when the membrane is putridified, then looking greasy and soft. These septic symptoms are greatly enlarged glands with infiltration about them, fetid corroding discharge from mouth and nose, patient pale and wax like, pulse very rapid and very weak, or very slow, 30 to 50, which is equally dangerous; temperature moderate or even subnormal. Profound prostration without delirium or coma. Local process may terminate in gangrene, which is rare, although decomposition of membrane is often taken for it. Now symptoms soon indicate prostration. Erysipelas may complicate. If the formation be extensive the process may extend from the fauces to the larynx, which gets reddened and swollen, grey membrane covers the cords and whole of the larynx. Symptoms of true croup rapidly come on, frequent dry cough, smothered soon, hoarseness of the voice, passing to extinction, prolonged whistling inspiration, episternal notch deepens, lower ribs drawn in with prolonged difficult expiration. Life destroyed in 2 to 3 days. Recovery sometimes takes place, false membrane gets thrown off, thought never to be liquified and absorbed. The disease may extend into the bronchi, casts of which may be expectorated. Recovery is now almost impossible, for capillary bronchitis with pulmonary collapse sets in. In adults laryngeal diphtheria does not so soon give the croupous symptoms, cough dry and rough, hoarseness, etc. Death is commoner by septicaemia than asphyxia in this form.

PRIMARY LARYNGEAL DIPHTHERIA.—Some hold the disease may attack the larynx primarily, is like membranous croup, debated. Symptoms as foregoing.

THE MALIGNANT CASES.—Disease kills speedily by constitutional action. A sore throat is the first symptom, but is not severe; throat is of a dusky red color. Sore throat may be preceded by a bad coryza, fever is high. Soon a membrane appears on the palate, and in 12 hours all parts are covered. The membrane rapidly decomposes. It invades the nose, so examine the nares for its presence. There may be swelling of the cervical glands out of all proportion to the throat symptoms. They swell rapidly, and infiltration is extensive, sleep is impossible, headache is bad, patient is exceedingly restless. In 36 to 48 hours the features get livid. There is delirium, temperature falls, pulse slow and irregular, and patient dies of symptoms of anaemia and coma, very tranquil. Symptoms are due to septicaemia. Malignant cases end fatally in 2 to 4 days—

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death in inflammatory, laryngeal and malignant forms often occurs from syncope, cardiac paralysis, or from cardiac embolism or thrombosis. A rash like scarlatina sometimes appears in children, is not followed by desquamation, lasts from a few hours to several days. Diphtheria may involve nares, lachrymal ducts and conjunctivæ, Eustachian tubes, larynx, bronchi, stomach, intestines, etc. It may attack external parts, such as the vulva, prepuce, etc., or on any raw surfaces, as wounds, especially on blistered surfaces, and give the same constitutional symptoms. The fact that diphtheria attacks the vulva, prepuce, etc., shews it has a predilection for them. It may produce the same constitutional symptoms with the same nervous sequelæ as in throat cases, without attacking the throat, hence proving it to be a constitutional disease. Rarely the throat is involved too.

COMPLICATIONS.—Albuminuria in 50 per cent. to 66 per cent. of the cases, appears early, even as early as the 2nd day, or as late as the 3rd week. It is so common as to be used as a diagnostic sign, it usually lasts but a short time; its intensity varies during the day, is thus intermittent. It may persist for a month or two, producing anæmia. It originates by several causes: 1. Impoverished blood. 2. Rapid tissue waste, work increased. 3. More food than can be assimilated, accounts for intermittent albuminuria. 4. Impending asphyxia from pneumonia. 5. Actual renal disorder from action of the poison or overwork. The urine is rarely smoky, as in scarlatina, but contains casts. It is not a dangerous symptom, occurs in even mild cases. Anasarca is a rare sequel, yet in certain epidemics it does occur. Hemorrhages from the nose, bronchi, mucous membranes are common. The purpura is often accompanied by sanguinous oozings from the nose, mouth, etc.

PULMONARY COMPLICATIONS.—Bronchitis, lobar pneumonia, collapse, are frequent causes of death; acute distention of the lungs, acute emphysema causing rupture of the vesicles rarely recognized during life. Pulmonary apoplexy is rare—anasarca, even attended by fatal termination. Disordered innervation—majority of cases of such occur after a mild attack; it does follow severe cases, but not so commonly. Its frequency varies with the epidemic, as 1 to 6; 10 per cent. is a good average. It does not occur in cases with albuminuria; it comes on from 8 days to 3 weeks from convalescence, but may occur just after the height of fever, or may be delayed 2 to 3 months after. Earliest disturbance may be frequent and uncontrollable vomiting; this may or may not be associated with retardation and weakening of cardiac action, even 24 to 16 beats per minute. The slowing is due to loss of power of the cardiac ganglia, hence power exerted by the inhibitory nerves. As a rule muscles of the soft palate suffer first, then muscles of the pharynx. The voice becomes nasal, and fluid returned by the nose. Then the pharynx is involved, swallowing is impaired, choking; may need rectal feeding or by a stomach tube. In those cases there is anæsthesia of palate, no contraction even by faradic current. This condition may be associated with

OCULAR DISORDERS.—The pupil may be immovable and dilated, and accommodation is lost, asthenopia, amblyopia, even amaurosis may follow. Strabismus,

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hence diplopia from paralysis of the ocular muscles may occur. The ophthalmoscope shews no lesion. These ocular lesions may be the first and only nervous lesions, hence for ocular paralytic affections enquire into diphtheritic history previously. Muscles of the epiglottis may be involved. Aphonia from vocal cord being paralyzed. Anaesthesia of the larynx. Tongue muscles paralysed. More rarely a more extensive area is involved, as the muscles of the trunk and extremities from paretic to complete paralysis of all the members. There is coldness, and finally anaesthesia affecting the toes and fingers. There is now a simulated locomotor ataxia, muscles atrophy and exhibit reaction of regeneration. Tendon reflex is lost even early, even during the onset of the attack. Cutaneous reflexes are not usually lost. Anaesthesia may extend; hyperaesthesia sometimes precedes anaesthesia. Paralysis may vary from day to day. There is no febrile reactions during this time.

PROGNOSIS is good. These cases generally recover unless the heart is badly affected. In a certain number of cases these are fatal from heart affection or from failure of respiration, from paralysis of its muscles, or from pneumonia from inhalation of material through anaesthetic lines, from starvation, or from fatty degeneration of the heart, from intercurrent disease. Diphtheritic paralysis is fatal in 10 per cent. of cases. Cause of paralysis is due to the action of poison on nervous system, also from degeneration of the muscles themselves and their nerves; from proliferation of the motor and sensory nerves and their sheaths; from irritation of the anterior roots of the nerves, secondary to irritation of the great cornua of the cord. Some call it a multiple neuritis.

OTHER COMPLICATIONS are rare. They are urticaria, embolism, ulcerative endocarditis, erysipelas, leucemia, Hodgkin's disease, purpura.

THE CONTAGIOUSNESS of diphtheria is now admitted, whether the membrane or the excretions are the infectious material is in dispute. The virulence of contagion varies with virulence of case. But age, impurity of air, concentration of poison influence, and there are also individual susceptibilities. The poison may be diffused through the air, but not widely. It cannot be conveyed over a few yards through external open air. It adheres obstinately for months to fomites, houses, etc. It is portable by clothing without affecting the wearer, but the clothes would need fair saturation with the virus, expectoration, excreta, etc.; infects sewers, wells, and so infects like typhoid. Therefore drinking water, sewer gas, etc., are infections. Milk may be the medium from absorption or impure water. It has not been shewn whether a cow can have diphtheria. It spreads in schools from breath, and because of no eruption mild cases continue at school. Inflammatory sore throat predisposes to it, so a person with such a throat should not expose himself. Erysipelas, scarlatina, measles, typhoid predispose, also the puerperal state to vaginal diphtheria. Dampness of dwelling favors cultivation of diphtheria, perhaps by favoring catarrh, etc. Diphtheria especially prevails in temperate climates, but is present in all. Unhygienic surroundings of the poor favor propagation of the disease. All ages are liable, but especially the young.



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Family predisposition seems to exist. Diphtheria originates in developing filth, especially fecal matter, sewerage, hence hygienic necessities. Diphtheria is one of oldest epidemic diseases, germs are universal and under favorable conditions readily develop.

INCUBATION varies, 1 case was 30 hours, some think even shorter may suffice—2 to 5 days is average, may be 12 to 14 days.

MORBID ANATOMY.—False membranes are yet divided into two—croupous and diphtheritic.

CROUPOUS INFLAMMATION.—When mucous membrane is so injured that its epithelium is partially destroyed, and vesicles injured so that exudation is poured out on surface of m.m., we have croupous inflammation. So a pale yellowish membrane forms on surface, this is connected loosely with subjacent membranes by fibrous threads, separate and m.m. beneath is found intact but red.

DIPHTHERITIC INFLAMMATION.—If mucous membrane is injured so that its epithelium dies without desquamation, vessels damaged pour out coagulating fluid which involves epithelial cells and coagulates themselves. M. m. coagulates into solid membrane. If the necrosis and coagula be superficial it is superficial diphtheritis; if involving sub-mucous membrane, it is parenchymatous diphtheritis. Diphtheritic disease is a specific one, and its local manifestation is this throat affection, etc. Its germ is introduced into membrane of throat and nose, hence affecting system secondarily. Breath, etc., is poisonous. Spleen is enlarged, proving disease constitutional. Bronchial tubes always inflamed with diphtheritic exudation about 4th to 5th day, preferring vertical tubes. Upper lobes of lungs are pale and emphysematous, base congested and back parts consolidated perhaps. Ecchymoses and small infarctions may be found posteriorly and under the pleuræ. Kidneys are attacked from outset, resembling acute parenchymatous nephritis in well marked cases. Malpighian tufts often filled with blood and micrococci. Liver,—capillary hemorrhages in cortex and under peritoneal covering. Stomach,—there may be extension here of diphtheritic exudation. Capillary hemorrhages may be found on intestines, meninges, lymphatic glands, voluntary muscles. Fatty degeneration in protracted cases, in heart muscle and voluntary muscles, sometimes waxy degeneration. Micrococci develop not only in the diphtheritic membrane but in the blood and most organs. Nervous system—alterations here found vary with the case; if death is due to general toxic causes the brain and cord are congested. If severe paralysis had occurred motor nerves had been found degenerated, also their spinal roots affected by proliferating neuritis. Multiple neuritis is a general affection.

DIAGNOSIS of follicular tonsillitis from diphtheria is often very difficult.

FOLLICULAR TONSILLITIS.—Excessive secretion of the follicles of tonsils which is forced out, is whitish or yellowish in color, distinctly circumscribed and obviously raised above the surface of the tonsil—often though exudation is so great it coalesces and runs over the edge of the tonsil. They do not extend from day to day, and are easily wiped out of the follicle, leaving it as a crevice or pit. There



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is an absence of fetor of breath, swelling of the glands at the angle of the jaw is absent, no grave constitutional disturbance, as vital depression or prostration. No tendency of the disease to extend to the larynx or nares. The exudation is limited to the tonsils. Gets well of itself. Is fatal only in young children from oedema of the glottis. Tenderness of the throat is greater in the first few days than in diphtheria.

DIPHTHERIA.—The membrane is not limited in early stage to follicles, is not much raised, is of a greyish color rather than yellowish, and patches have a tendency to coalesce. The membrane extends to the tonsils, covering the fauces palate, pharynx; if brushed off leaves a raw surface. No fetor of the breath in mild cases. Glands at the angle of the jaw and bifurcation of the carotid enlarge and are tender. A great feeling of prostration. Tendency to extend to the nares or larynx. Exudation spreads from the tonsils to the surrounding parts. Is a very fatal disease, is infectious. Tenderness of the throat less at first.

TREATMENT.—No specific treatment is known for diphtheria. Treat on general principles. Dietetic and hygienic treatment are important. Have the patient in a large room. This is important both for the patient and yourself. A cool temperature is important, 65 degrees prevents development of contagion. Assist positively on the patient remaining in bed even in mild cases. Keep the strength up by strong soups, milk, eggs. If milk disagrees, peptonize it. Alcohol in severe cases from the beginning, in mild cases as experience prompts. Standard remedy is Iron—Tr. Ferri Perch. in full doses 20 to 40 gtt. in $\frac{1}{2}$ oz. Glycerine every 2 to 3 hours. Give $\frac{1}{2}$ oz. of the Tinct. every 24 hours. Children will need less, of course. Above is the adult dose. Keep up Iron till the tongue gets red. Pot. Chlor. is often given with the Iron. For a child of 3 years, $\frac{1}{2}$ dr. in the 24 hours. Remember that large doses of the Pot. Chlor. tends to cause nephritis, hence care is needed in prescribing it. For headache, vomiting, high temperature, Iron is not well borne. For the later septic stages give Quinine for a few days in fairly full doses.

IN LARYNGEAL FORM use Hydrarg. Bichlor., smallest daily dose $\frac{1}{4}$ gr. for infant of 4 months, gr. $\frac{1}{2}$ daily to child 4 to 5 years old for 4 to 8 days. Doses vary from $\frac{1}{30}$ th to $\frac{1}{60}$ th gr. hourly. This drug must be well diluted, 1 to $\frac{6}{10,000}$ in water or milk. If intestinal irritation occurs give Opium and further dilute the Perchloride. Tracheotomy or intubation can only be avoided if the Hyd. Perch. be given in time; but if you have to operate, still continue the Perch. Sod. Salicyl. is dangerous, it depresses the heart. Benzoate of Soda is used to kill the specific germs in the blood by being even injected hypodermically, but is really no use.

LOCAL TREATMENT.—Cauterizing or destroying the membrane leaves a raw surface ready to be infected, hence soothing measures alone are to be employed. Solvents of the membrane have been advocated, as Liq. Potass. 1 in 4, or Lime Water or Lactic Acid. This last is most reliable. Apply with brush or swab. At outset of the case paint membrane with 1 part of Bals. Tolu. to 5 parts of

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Ether, painting 5 times daily so as to exclude the air. This has not proved good. Astringent gargles are powerless to arrest the exudation, as they seem to irritate and destroy the appetite. Inhalations of steam, slacked fresh lime close to patient, so both lime and steam are inhaled; this is a good deal used. Lime water and water, equal parts of each, and Carb. Ac. 1 to 3 per cent., makes a good spray. Inhalation of Turpentine under a tent over the bed constantly is used too. A solution of papoid with solvent properties has been tried in the General Hospital, 5 per cent. or even stronger—use it fresh, paint frequently. Dr. Ross thinks it good, keeps the throat sweet, and seems to arrest the spread of exudation, is worth a trial—must be applied every hour, day and night, for a couple of days. Bell's solution for the throat is good—Tr. Ferri. Perch. dr. 4, Sulphurous Ae. dr. 2, Carb. Acid dr. 1, Glycerine dr. 4; apply on a brush. Hyd. Perchlor. 1 in 3000 is also used. Use it very carefully in grown persons, so the solution will not be swallowed. Inhalations of steam 120 degrees for 15 minutes every $\frac{1}{2}$ hour, but some think it increases the catarrhal state. Dr. Ross thinks it is beneficial when the nose and trachea are involved. Have a kettle over an alcohol lamp. A gas stove in the room is bad, as it uses too much oxygen. Cresoline burnt in a lamp is good, or tar preparations, but the latter are dirty from soot. If nares be affected, it is of the utmost importance that they be cleansed. A weak solution of common salt or Sod. Carb. will do by injecting slowly into the anterior nares. Have the mouth open so the fluid will not go into the Eustachian tubes. Use it every 1 to 2 hours, or Carb. Ac. gr. 2 to the oz., or Permang. of Potash. If nares be obstructed pass a probe so that an injection can get in. A good lotion, the best, but needing care, is Perchlor. of Mercury sol. 1 in $\frac{5}{10,000}$ ths. A new plan is to destroy the membrane by aetnal cautery. If the larynx is affected it is serious. Constitutional treatment is the same as pharyngeal, local treatment differs. Dr. Jacobi believes in the use of Perchlor. of Mercury in laryngeal cases; some use Calomel.

LOCAL TREATMENT.—Cannot arrest the extension of the membrane. Removal of the membrane is difficult. Inhalations may be tried or sprays of $\frac{1}{5}$ ths of Lactic Acid, or Lime Water, to liquify the membrane, but do it slowly and superficially. Papoid spray can also be used, but its liquifying power is extremely small. Emetics are sometimes useful. Use one that has not a depressing effect, such as Copper or Zinc Sulphate or Alum, but not Ipecac or Antimony. There is no use in using it early, as the membrane is still adherent; but as the membrane is giving way, then is the time to use it. Mechanical interference in the larynx by brush, etc., sometimes is good, as it detaches the false membrane, but is an uncertain method. So an attempt at intubation often does good. If asphyxia threatens by filling up of the larynx, either intubation or tracheotomy may be done. Intubation is more readily assented to, and is less dangerous. Has no wound to get affected. Again the air is warmed by passing along the natural passages, and the tube keeps quite clean. It is a delicate operation, needs to be inserted rapidly, hence better to practice on the cadaver. Getting the tube out

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again is harder than putting it in. Child may struggle so as to have fatal results from heart failure. One danger of intubation is the entrance of food and liquids down the tube, and death often results from septic pneumonia, hence for the first 3 days let the child drink nothing but water, and feed it by a tube into the stomach. Tracheotomy is a last resort, is not successful operation. Authorities say that tracheotomy should be performed as soon as there are symptoms of laryngeal stenosis, before the vital powers have failed or the lungs have begun to collapse. But every case of laryngeal diphtheria does not need tracheotomy; many recover.

DIPHTHERITIC PARALYSIS.—If mild and limited, it recovers spontaneously in a few weeks. In severe cases the patient needs watching. Feed him well, give stimulants, wine, Iron and Quinine. Sometimes the patient cannot swallow, hence use stomach pump or feed by rectum. Sometimes semi-solids such as oysters are swallowed better than fluids. Keep affected muscles warm and use friction. When the process has ceased, use electricity. Gr. $\frac{1}{60}$ th of Strychnia may be now injected. Warm baths, sulphur baths are good.

LIV. ASIATIC CHOLERA.

Is epidemic, malignant, Oriental, Indian, spasmodic cholera, etc. Is indigenous in India as a sporadic disease with epidemics. In 1816 a wave of cholera started from India westward, and in 15 years spread over the world. It appeared at Quebec in 1832 in an emigrant vessel from Dublin. In June, 1834, it again appeared, and then invaded the Maritime Provinces. In 1848 it broke out at New Orleans by a vessel from Havre, reaching Chicago in 1849, spreading east, and so reaching Canada from the West. In 1854 the 4th epidemic occurred in Canada. Canadian cholera if severe greatly resembles Asiatic cholera. The symptoms of cholera may vary. There are two varieties: 1, the milder; 2, the gravior. The first is often called by the French. Various stages are: 1. Incubation, from several hours to 3 days. 2. Invasion and development, which latter may be so short as not to be noticed. 3. Algid stage, patient cold and pulseless, which stage lasts from a few minutes to 48 hours. 4. Reaction stage—this is the febrile stage, is common in Europe and America. At one time not noticed in India. This stage lasts from 4 to 8 days, so the duration of the disease is from a few hours to 1 to 4 weeks. Incubation—is ordinarily 3 to 4 days, some say it is never less than 2 days, but a case where it was only 19 hours was noted. Quarantine of vessels is from 5 to 7 days. Invasion—may be quite short, sometimes prodromata of diarrhoea. Mental depression, impaired appetite, weak pulse, may occur. Indefinite symptoms are often absent. The early symptom in most cases is slight diarrhoea with colicky pains. Is feculent at first, then becoming bilious, then more serous, then rice water stools. The stools are copious. Often the attack is at 2 to 3 in the morning, is accompanied

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by a sensation of epigastric depression, then vomiting, changing till it resembles stools, then cramps begin in the extremities. Thirst is extreme, restlessness, oppression, anxiety, pulse weak. These symptoms more or less rapidly pass into the

ALGIDE STAGE.—Temperature falls rapidly, surface icy cold, skin insensible even to boiling water, fingers shrunken. Patient complains of oppression, wants fresh air, wants water for the thirst, restless, throws clothes off. Pulse 120 to 140, weak, gradually becoming extinct at wrists till you only get it at the axilla or neck. The apex beat is gone, sounds weak, venous circulation languid, hence surface gets blue and cyanotic. If the patient be now bled the blood merely trickles, is thick, dark and viscid. Nervous functions less disturbed than other systems. Spasms of the extremities, face, cramps, hence spasmodic cholera. The mind is apathetic, fear changing to indifference. Muscular strength may be retained late. Secretions generally diminished or suppressed, voice feeble, husky to extinction from exhaustion and dryness of the vocal cord. Countenance gets of a choleraic aspect, shrunken, sharp features, corneæ flat, tongue cold, etc. This algide stage in most cases may come on in a few minutes. Temperature varies from 90 to 97 in the axilla, but higher, 100 to 103, in rectum. The above symptoms are present in all cases unless arrested. Vomiting and purging may cease, patient dozes.

THE STAGE OF REACTION.—If algide stage is survived, febrile stage or stage of reaction or recovery may ensue. First sign of recovery is a sound sleep with a healthy, warm and moist skin, respirations freer, circulation better, urine appears, fæces changing, and recovery progresses. Febrile reaction is a frequent following of collapse, skin gets warmer, pulse rapid, tongue gets dry and brown, sordes on the teeth, diarrhœa continues, gets bilious, greenish, may become a dysentery, or constipation with a bilious vomiting may occur. Urine albuminous and with casts is again secreted. These typhoid symptoms may pass into coma or exhaustion from diarrhœa, or after 4 to 8 days struggle convalescence sets in. The above is typhoid cholera. It is due to the suppressions of the functions of the kidney, hence uræmic symptoms, or it may be due to cholera poison. The urine ceases to be albuminous in 2 to 10 days, no permanent damage to the kidney ensues. Inflammation with diphtheritic exudation in the intestines occurs sometimes like a dysentery.

DEVELOPMENT AND PROGRESS.—Slight forms begin with watery purging and vomiting, passing gradually into the other varieties—marked loss of power slowly reached—cramps do not ensue till the fæces are rice water like algide symptoms. Are developed gradually, are less severe, and recovery is frequent. Severer form—Poison is more energetic, often 2 to 3 stools, severe cramps follow and are continued, succeeded and accompanied by algide symptoms. After death intestines are filled with a thick, white mucus. Early arrest of pulmonary circulation, hence algide symptoms almost at once. There is little or no purging and arrest

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of all the secretions, vertigo, coma and blueness of the surfaces, early and deep coma. Death may occur in 2 to 4 hours. Cases lasting only 5 minutes are recorded in India.

ROSE OF CHOLERA.—May appear in the stage of reaction, attended by slight febrile symptoms; other symptoms have been noted, such as herpes, urticaria, etc.

SEQUELÆ.—1. Ulceration of the pernea from irritation of dust in young ones. 2. Enlargement of the parotids, suppuration following. Boils, bedsores, inflammation of the lungs.

TEMPERATURE.—In the 1st stage temperature falls, axillary temperature 95, rectum 98. In 2nd stage there is moderate collapse, axillary temperature 94 rectum 100. In advanced collapse the axillary temperature is 97, rectum 103,—that is approaching reaction stage. 3th stage or reaction stage, axillary temperature 96, rectum 97.

ALTERATIONS OF BLOOD.—During the cold stage the blood is dark, viscid and tar like. The specific gravity of the serum is high from drainage of water, is less alkaline than usual. Liq. sanguinous and water escapes from the capillaries into the intestines, hence the relative excess of solids in the blood. The transudation is of short duration, maximum reached at 36 hours, and then the water is reabsorbed from the intestines by the blood and the specific gravity of the blood falls. A transudation of constituents of the blood cells into the serum takes place at the same time. During intestinal transudation the fluids in most of the tissues are attracted to the blood. These fluids are loaded with nutritive materials, lactic acid, sugar, etc., hence contamination of the blood and its alterations.

MORBID ANATOMY.—If death ensues very rapidly you find few or no alterations in the structure; death comes from death of the blood induced by the poison concentrated, or the dose large, and personalities predisposes. After death a rise in the temperature of the skin takes place, and retains its warmth for a long time. Muscular contractions may last for a few minutes to 1 hour after death from tremors strong enough to alter the position of the limb or body—seen in vigorous subjects and in rapid cases. Rigor mortis sets in in 1 to 2 hours, and lasts long. Putrefaction is slow in beginning. In the algide stage, if death were within 24 to 48 hours, no lesions will be discovered; but if later, the small intestines shew a lesion. Mucous membrane and sub-mucous tissue and villi are tumid and pulpy, either pale or congested in the ileum or duodenum. This congestion is either inflammatory, venous, or is of a bright punctate redness with ecchymoses and an exudation of tenaceous mucus. Sometimes only the borders of Peyer's Patches are congested. The diphtheritic exudation is most frequently found in lower part of ileum. The intestines are filled with thick turbid rice water contents. The flakes in stools consist of masses of mucus filled with leucocytes. No bile is found in intestines although gall bladder is full. Where membrane is hemorrhagic, the contents of bowel are bloody and stinking. Peyer's glands are raised, rarely congested. This enlargement is peculiar to

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cases where diarrhoea preceded the attack. Spleen is generally normal, sometimes anæmic. Liver small, flaccid, wrinkled, anæmic. If post mortem be made in stage of reaction, febrile, the shrunken appearances have gone, intestinal contents have lost their rice water characters. The mucous membranes will be inflamed, and diphtheritic exudation is common. The glands and Peyer's are often enlarged and congested. Lungs often inflamed.

IN URÆMIC CASES appearances are like acute Bright's after scarlatina, bladder still empty. The first symptoms of cholera indicate that the ganglia of intestines are seat of choleraic poison. These sympathetic ganglia are depressed, and this leads thereby to exhaustion of capillary power, capillary congestion, exudation, hemorrhages. Thus vaso-motor nerves of intestines seem paralyzed. Kidneys sometimes in early stage are in same way affected, hence albuminuria. Liver not usually affected early. The bile is not always absent from stools in early stage of cholera, the diarrhoea being bilious till later.

COLLAPSE, ALGIDÆ SYMPTOMS.—General view as above is due to thickening of blood by drain on it, hence poor circulation in viscera and lungs. Others hold that the collapse is due to action of poison directly on nervous system, this exaggerated by the drain on blood by the transudation into bowel. But it is rare to have collapse without transudation, perhaps only into bowel, it not appearing externally as rice water stool. Disease is due to specific germ associated perhaps with formation of a specific poison, if it is not itself the agent. That it is not a telluric influence is proved by its continuance in limited (1) localities in India, not wafted by air; (2) its partial distribution; (3) exemption of certain areas exactly resembling localities not exempt; (4) dissemination through a country from a focus; (5) its slow progress over a country; (6) its great leaps from country to country; (7) its tendency to follow lines of travel. Investigation proves that the specific germ exists in the evacuations. Koch has isolated and cultivated this bacillus. Cholera is classed among the miasmatic contagious diseases, because its poison after leaving body must undergo change before becoming infectious, like typhoid. Koch denies this. Koch found his bacillus in intestinal mucous membranes, the discharges, etc., also in the water tanks around which local attacks occurred, which bacilli disappeared from the tanks when disease had subsided. He could not find the bacilli anywhere else in body except in intestines. They were found in the tubular glands between epithelium, in mucosa and submucosa. They were found in recent stools, soiled linen, etc. The bacillus is thicker and shorter than tubercle bacillus, slightly curved, hence name "comma bacillus." These may unite at end, hence a semicircle or an "S." They grow to form spirals, like spirillum. They grow readily in milk, blood, gelatine or potato. Grow at temperature freezing, 14 degree F. did not destroy them. Do not grow if deprived of oxygen, but do not die. They are readily killed by drying in 1 to 24 hours, hence has no "resting stage." This is a valuable fact, for drying is better than disinfectants in killing these bacilli. Koch says ordinary disinfectants will

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not kill the cholera germ; he says they will favor the growth of the germ, for products of decomposition hinder the growth of the bacillus. Koch has failed to inoculate any animal with cholera stools or cultivation. These animals do not get cholera. Thus several animal diseases are not capable of propagation to man, as "rinder-pest." A "comma bacillus" is also found in Canadian cholera, some say in all epidemic diarrhoea, but it is not necessarily the same. In fact, such bacilli have been found in secretions off the mouths of healthy people. The Marseilles Cholera Commission gave cholera with death in 24 hours to a rabbit by injections into veins from stools. They think cholera is a blood disease which causes softening of the hæmoglobin corpuscles, which lose elasticity, etc. Koch does not claim that comma bacillus is the cause of cholera, but merely a concomitant.

MODE OF PROPAGATION.—One mode is multiplication in the body and elimination by the stools. It is thought the virus is only so eliminated.

MODE OF ENTRANCE.—Dr. Snow's investigations shewed that contamination of drinking water by cholera evacuation was one mode. Koch maintains it is by drink and food. Milk is one vehicle. Koch denies that the air is a vehicle; he says the bacillus is dried and destroyed if it gets into the air. Vienna conference said it might be propagated a very short distance by air. Clothes soiled by evacuations retain infection for a long time. Soiling of the hands, hence contamination of food or lips, may be a mode of transmission. Physicians and nurses seem exempt from the disease. It is an exception for a doctor to take the disease. Flies, etc., may contaminate food, water, etc. External conditions have an influence in the spread of cholera. Following conditions favor development: 1, moderately elevated temperature; 2, certain amount of moisture; 3, stagnant atmosphere; 4, water, air or soil contaminated with decomposing animal matter; 5, overcrowding; 6, bad ventilation. Above influences aid also indirectly by favoring lowering of personal vitality. Personal influences favoring disease. Those reducing powers of resistance, as fatigue, poverty, old age, chronic diseases, unwholesome food, use of bad meat, unripe food, may induce intestinal catarrh, hence favoring arrest of cholera poison in the bowels.

PROGNOSIS.—Always grave. Mortality averages 50 per cent., ranges from 20 to 80 per cent., greatest at beginning of epidemic. The aged, intemperate, those in unhygienic surroundings are in most danger.

TREATMENT.—Endeavor to arrest premonitory symptoms of diarrhoea. Remedies are same as in diarrhoea. Astringents—Opium with others. R. Pulv. Arom. dr. 3, Tr. Catechu dr. 6, Tr. Opii dr. 1, Tr. Card. dr. 6, Mist. Cretæ, ad 6 ozs. Sig. $\frac{1}{2}$ oz. every hour till diarrhoea lessens, then less often. Mixtures with Tr. Opii, Tr. Kino and Mist. Cretæ are also used. Another is Zn. Sulph., Tr. Catechu, Tr. Opii. Another is Plumb. Acet. gr. 2, Camphor gr. 1, Pulv. Op. gr. 1, in a pill. Another is Pulv. Opii gr. 1, Plumb. Acet. gr. 4, make a pill. Give a pill after each movement of bowels till 3 are given, then regulate dose afterwards. Another,—Tr. Op., Spt. Camph., Tr.

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Capsici aa dr. 3, give 6 to 20 gtt. as dose. Ac. Sulph. Dil., Ether Sulph., Tr. Opii is a good mixture, but Opium is the best of all these remedies. Flint says: give Morph. Sulph. in large doses (gr. $\frac{1}{2}$ to 1), repeated in an hour. Lay on tongue and wash down with a little water. R. Indian pill—Opii Pulv. gr. 1, Asa-fetida gr. 2 in pill. If the diarrhoea resembles summer diarrhoea, bilious, give Calomel gr. 5, Opium gr. 1 to 2. Other means—insist on rest in bed, in horizontal position,—this is important.

DIET.—Nourishing fluids in small quantities,—milk, boiled rice, arrowroot, Nestlé's food, stimulants if needed. If diarrhoea is arrested, diet must still be light and not relaxing. A bandage, cotton lined with flannel, is recommended, bind tightly about abdomen. In stage of rice water stools, endeavor to arrest this. Opium still continued. If retained it may do, repeat in an hour if purging persist. If it is vomited, give again in 15 minutes. If vomiting be persistent, give Morphia hypodermically. Plumb. Acet. is also still used, give grs. 3 to 5 in solution and gtt. 3 Acid Acetic to keep in solution, in little cold water. This may be alternated with the Opium. After first 3 hours, give gr. $\frac{1}{2}$ doses of Opium with the mixture of Plumb. Acet. Where diarrhoea and vomiting have cramps in addition, try to allay vomiting by applying ice, sinapisms, or turp. stupes to epigastrium, etc., or friction. Chloroform is good for this purpose, m. 5 to 10 in little water—relieves the cramps. If vomiting and cramps be violent, give Chloroform by inhalation. The thirst is allayed by ice or a little ice water, and wash out mouth often by cold water. Large draughts of water are to be avoided. When stage of collapse has set in, then therapeutic measures are no good. The process of absorption by stomach now is at a stand still, hence medicines do not enter system. Often now vomiting and diarrhoea cease. If purging continues, then Ac. Sulph. Dil. may be given frequently. Opium is no good in this stage, called algide stage. Thirst is allayed by diluents, ice. Some recommend hypodermic injection of quantities of water. Injection of salines or milk into veins has been tried. Results have not been brilliant. External use of heat and frictions, as warm water bath 98 to 100 degrees may be tried. Moderate stimulants while pulse continues, brandy 6 ozs. in 10 hours, or give Ether Sulph. $\frac{1}{2}$ dr. every $\frac{1}{2}$ hour.

STAGE OF REACTION.—If secretions are returning, do not do anything. Diet light; if constipated, do not use an aperient, rather an enema. For drinks—water. To restore action of kidneys is important, so give tumbler of water every hour, or dry cup the loins, or place sinapisms there, or use wet pack to promote excretion by skin. Use of catheter may favor secretion by not allowing bladder to become distended. Uræmia—treat on general principles. If reaction is imperfect, discharges continue, secretions not appearing, then this patient will sink in 3 to 4 days.

PROPHYLAXIS.—Put patient in large airy room, isolate patient. Secure good nursing, it is important. Evacuations to be received into vessels containing Zinc Chlor. or Fe Cl₂, or Acid Carb., or Fe Sul. (1 $\frac{1}{2}$ lb. to gallon), and evac-



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nations should then be buried 5 feet deep at distance from well, etc. Do not put into privies or sewers. Vessels used about patient must be cleansed by disinfecting solutions. Soiled linen—plunge at once into solution of Zn. Cl_2 for 24 hours, then boil, and afterwards expose to sulphur fumigation. Articles which cannot be so treated should be burned, hence value of straw beds in hospitals. Purify rooms after by ventilation, washing walls and SO_2 fumigation. Disinfect the air of the room by SO_2 , Cl , Nitrous Oxide in succession. Disinfectants most relied on are Zn. Chlor. 2 , Zn. SO_4 , Acid Carb., Sulphuric Acid SO_2 , free ventilation and high temperature '12 to 250 F. Corpses should be buried in 24 hours, lime in coffin. During epidemic boil all drinking water, do not use purgatives.

U. S. RULES FOR DISINFECTION.—1. Rolled Sulphur for fumigation, 2 lbs. in room of 10 feet square, keep room tightly closed for 24 hours. 2. Soak bed-clothes at bedside in solution of Hg. Cl_2 and boil subsequently. 3. Carbolic Acid is not to be trusted, for its strength varies, and odor deceives as to strength. 4. Burn all articles, this is safest plan. 5. Articles which will not wash fumigate with Sulphur, and then ventilate in air. 6. Discharges from patients received into solution of Fe. SO_4 , $1\frac{1}{2}$ lbs. to gallon. 7. Wash corpse in Zn. Cl_2 , solution of double strength, wrap in sheet wet with, and bury in 24 hours. Funeral not public.

LV. CHOLERA NOSTRAS (EUROPEA)

Is met chiefly in hot weather, resembles Asiatic cholera, but it is rare for rice water stools or stage of collapse to be reached except in aged persons and children.

PRODROMATA.—Uneasiness in epigastrium, flatulence, pain, but more often it begins suddenly at night,—2 a. m. generally. Stools are fecal, thin, vomiting soon appears. Both vomiting and purging are very frequent, and violent cramps are common both in extremities and abdomen. In bad case collapse follows, shrunken features, suppression of urine, etc., as in algide stage of true cholera, generally in aged or those who have poor resistance. This algide stage may be reached very rapidly. As a rule treatment acts readily. Sometimes in a febrile stage reaction succeeds. No matter how severe the algide stage, try and secure a reaction; you will generally succeed.

CAUSES.—Prolonged heat, as after hot spell, chills, poor food, unripe fruit, unsanitary surroundings, arsenic and irritant poisons. It is chiefly sporadic, but occasionally epidemic. P. M. appearances are like in true cholera, but death is rare.

TREATMENT is much like Asiatic cholera. The great remedy is Opium and the combination with Calomel is very good, Calomel gr. 6, Opium gr. 1 to 2, put dry on tongue and wash down with a little water. Repeat in 15 minutes if vomited. Do not allow any drink. Put sinapism over epigastrium. As a rule these remedies promptly arrest vomiting, purging and pain. Tinct. of ginger, hypodermic injection of Morphia. Aftertreatment is Liq. Morph. gtt. 10, Sp. Chlor. gtt. 10, Glycerine gtt. 15, in $\frac{1}{2}$ oz. cold water. Watch diet for a day or so. If algide

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stage is reached then use heat to body, etc., as in cholera. Quarantine in cholera seven days for ship. It has been reduced to five days by French. English system is medical inspection and isolation rather than quarantine. Medical officer examines every passenger on suspected vessel, sends sick to hospital, takes names and addresses of all passengers, and advises local authorities at points of destination of each of passengers who are allowed at once to proceed.

LVI. PERTUSSIS (WHOOING COUGH)

Is infections—a zymotic disease characterized by catarrh of respiratory tract and a peculiar spasmodic cough occurring in paroxysms and at intervals. Incubation, 10 to 14 days is average, may be less or more. Disease is divided into three stages: 1. Catarrhal stage, 10 to 14 days; 2, spasmodic, 3 to 8 weeks; 3, convalescent, 3 weeks.

CATARRHAL STAGE.—Symptoms of cold in head, cough dry and short, running of nose, fullness in head, slight soreness of throat. There is also a very mild febrile stage, but sometimes is severe. This stage lasts 10 to 14 days, but may be as short as 4 days, and peculiar cough sets in at once, is rare, or stage may last 3 weeks. So far disease is hard to diagnose, is like catarrhal bronchitis.

SPASMODIC STAGE is present when cough is paroxysmal and followed by characteristic whoop. At onset of cough child becomes alarmed, seizes something for support. Cough is characterized by labored inspiration and expiration. The expiration consists of a series (6, 8, 10 to 12) of coughs, short and violent, rapidly succeeding without any inspiration between, and child has eyes staring and protruding, face gets swollen, turgid, livid. Spasms now momentarily relieved, hence a prolonged inspiration with characteristic crowing, whooping noise. And same is again repeated. These paroxysms are made up of several such attacks. When prolonged, the congestion in vessels of head is so great that hemorrhage from eyes, nose and ears occurs, so that there is sub-conjunctival ecchymoses. Slight convulsions may occur, vomiting is common, ejection of feces. Paroxysm commonly terminates by vomiting or by expectoration of glairy clean fluid—child is left exhausted. Circulation becomes natural again. In severe cases child appears fatigued, pale, refuses food, etc. Frequency of paroxysms is in proportion to their severity,—commonly they recur every $1\frac{1}{2}$ to 2 hours, but there may only be 2 in a day—are generally more frequent at night. Some excitant is generally a cause of paroxysm, as laughing, crying, drinking cold water—common after eating. After 3 to 4 weeks paroxysms diminish in frequency and severity, and by 8th week convalescence sets in. Ulceration of Frenum Linguae is a good sign of pertussis, due to scraping against teeth in paroxysm.

STAGE OF CONVALESCENCE.—Seizures are less severe and frequent, expectoration more muco-purulent, vomiting ceases, etc.; in three weeks child is well but for months a cold may give paroxysms like whooping cough. There remains an

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irritable state of air passages, especially larynx, hence spasm of glottis. Physical signs are absent in chest if disease be not complicated. If bronchial glands be enlarged, over their situation you may in young children make out prolonged rough inspiration.

PROGNOSIS.—Mild uncomplicated whooping cough ends favorably.

COMPLICATIONS.—Capillary bronchitis is common, most dangerous late in the disease. The tougher the mucus, the more the distress. It often leads to collapse of the lobules, so increasing the dyspnoea. Catarrhal or croupous pneumonia is rarer. Pleurisy gives frightful sufferings in the paroxysms, and is also rare. Rupture of air cells in violent coughing, hence acute emphysema leading to sudden death—convulsions most frequent in teething children. Tuberculous inflammation of the brain ending in acute hydrocephalus rare also. Gastro-enteritis and suppression of expectoration. Abdominal pain, cannot vomit, cannot whoop, hence the name "dumb kink." Evacuations loose. Measles not infrequently co-exist with pertussis, often modify or arrest the cough while the disease lasts, the cough reappearing after the measles is over. Bronchial asthma and vesicular emphysema are apt to follow a severe attack. Bronchitis, pneumonia, phthisis may be sequelae. Morbid anatomy uncomplicated, and death occurs, no lesions are found. Alterations found are from complications—pulmonary collapse is usually found, acute vesicular emphysema compensating with it—larynx and trachea not affected, capillary bronchi inflamed. Effusion of serum or even blood into the brain. If abdominal complications existed you will find congestion there—lymphatics enlarged—bronchial glands at the root of lung are always enlarged. Relapse of whooping cough is from these glands becoming enlarged by congestion consequent on cold. Pertussis is infectious, depends on specific virus. The breath and the sputa contain it. One holds the disease is due to the irritative state of the vagus. Children have been born with the disease, but the virus has not been found in the blood. An organism resembling *leptothorix buccalis* is thought to be the exciting agent—cultivation and inoculation prove the germ theory. This virus seems to act specially on the nervous system and respiratory tract. In the mucous membrane of the respiratory tract it excites a specific inflammatory action. Also in the terminus of the vagus in the lungs and stomach. This accounts for the early nasal laryngeal catarrh for vomiting, paroxysmal cough, etc. Severe whooping cough is often fatal, rarely mild.

TREATMENT.—In mild cases protect from exposure, as the respiratory mucous membrane is irritable, so do not expose to weather unless it is mild, and give a mild diet. Keep child in warm dry air, give mild expectorants and laxatives. In severe cases enforce the above regulations more scrupulously, and treat complications as they arrive, you cannot abort the disease. During catarrhal stage use expectorants and mild nauseants, as *Ipecac* and *Antimony*, dose according to age. At the beginning of the paroxysmal stage add to the above *Am. Bromide*

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or Belladon. Mild counter-irritation to the chest is good, as liniment Acet. Ac. and turpentine, or a sinapism. Do not use evaporating liniment, it cools. In spasmodic stage give nauseants, as Ipecac. To lessen the severity of paroxysm give Pot. or Am. Bromide or Chloral or Camphor; Bellad. or Atropine are favorites. Give Tr. Bellad. gtt. 10 to children 2 to 3 years every hour; watch effects, it is not so useful if bronchitis complicates the case. Some Liq. Atropin. m. 1 in the a.m. or gr. $\frac{1}{2}$ th of Atropine to children 1 to 4 years. Give early in the forenoon, give once a day or in severe cases give another $\frac{1}{2}$ dose at night, push till it dilates the pupil. Dr. Ross says it is best to give it in solid form, advises to give in pellets. Enstace Smith gives Atropine $\frac{1}{3}$ th, Zinc Sulph. gr. $\frac{1}{6}$ th in glycerine and water morning and evening for 2 days, then T. I. D. If spasms are severe, give the night dose of Am. Bromide in addition. A covering over the bed by keeping off drafts aids to lessen the spasms. Alum gr. $\frac{2}{3}$ th in honey every 6 hours in declining stage. The use of Quinine in pertussis was largely used, results are not satisfactory, hard to get the child to take it. Tannate of Quinine is the form to give it in. Salicyl. Ac. has been used with success with some. Dr. Howard recommended it. R. Salicyl. Ac. gr. 35, Alum Sulph. gr. 50, Acid Hydrocyanic Dil. gtt. 9, Syr. Lemon 4 oz. Sig. 1 dr. every 3 hours for child of 3 years. Chloral is used for severe spasms. Sprays of weak solutions of Ac. Carb. or Eucalyptol are used by some. Stage of convalescence—best treatment is change of air. It gives remarkable results, keep from exposure to the weather. Give nutritious diet, Cod Liver Oil. For pulmonary collapse give stimulants, an occasional emetic. One attack generally protects from a second, but less than in other diseases.

LVII. MUMPS OR PAROTITIS.

Is an inflammation of the parotid gland. There are two forms: 1. Idiopathic mumps, which are epidemic; 2. metastatic, which are not epidemic.

IDIOPATHIC PAROTITIS.—This occurs in epidemics, so resembles the other acute infectious diseases, but is unlike them,—1, in its short duration; 2, in slight constitutional disturbances. There are indications of a specific contagion for the disease, which causes local manifestations, but little constitutional signs, thus resembling pertussis—epidemics are less frequent than of the exanthems.

ÆTIOLOGY.—It affects sexes differently, males have it oftenest. Children between 2 to 15 are most frequently affected, nurslings are exempt, also very old people, adults have it but seldom. One attack protects against another; it often accompanies, precedes or follows an epidemic of measles. An epidemic does not last long. Its contagiousness is well established by tracing house or local outbreaks. Stage of incubation from 4 to 12 days.

SYMPTOMS.—Often at first is a local pain on opening the mouth, but sometimes there are prodromata, which may last a few days. Are general and not distinct, feeling out of sorts, general pains, languor, headache, slight chills, perhaps a little fever or loss of appetite.

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LOCAL pain about the angle of the jaw, spreads to the ear, and thus becomes more definite, any movement of the jaw increases it; shortly swelling begins, and soon a distinct tumor forms—is generally on one side, but may be bilateral. This swelling occurs just below the lobe of the ear, and gradually raises up the lobe and throws it outward. This tumor is never very hard (unlike the metastatic variety). Is composed partly of enlarged gland, but mostly of surrounding oedematous tissue. The swelling is diffused and the borders not defined. As the swelling increases the infra-maxillary and sublingual regions increase in size, so the neck may measure as much around as the head. The effect is to give a fixed and stolid expression to the face, especially if bilateral. Patient looks idiotic, stupid. If swelling goes deep, tonsils may be affected, hence dysphagia or nasal warts, or sense of suffocation. Skin over the swelling is generally normal looking, not hot or inflamed. Occasionally it is slightly inflamed. If swelling is very great skin may be glistening and pale. The pain is not severe. One is felt at the articulation of the jaw, one over the mastoid. The head of the patient is held stiffly. If swelling is great the mouth cannot be opened, any attempt is very painful. Other symptoms from disturbance of neighboring parts are obstruction of the Eustachian tube, hence deafness or tinnitus. Salivary glands may have function suppressed, hence ptyalism. Occasionally symptoms of cerebral hyperæmia are seen. The disease may be bilateral or unilateral, according to the epidemic. Pulse not much affected, fever slight and transitory, nothing typical; pulse and temperature will be only 4 to 5 days abnormal.

COURSE OF THE DISEASE.—Almost always favorable, symptoms are good and subside, also the swelling, and recovery takes place in 2 weeks at the outset. The oedematous swelling disappears with great rapidity, only in the scrofulous is there delay and absorption; as swelling disappears there is slight desquamation over the affected area.

INFLAMMATION of the testicles is common, generally occurs in youths or virile men. Is a true orchitis in the body of the testicle itself, but may be an epididymitis, generally with hydrocele. The orchitis is characterized by considerable swelling, but the pain is not as great as from gonorrhœa. Often there is a discharge from the urethra like gonorrhœa, sometimes with sealding. If a man with gonorrhœa gets mumps he is not more liable to orchitis than others. Treatment of orchitis is by an emetic—testicles swell 4 to 6 days, subsides in 2 weeks. Orchitis sets in at the end of the 1st week, is generally unilateral; generally on the right side, although the left parotid is oftenest affected; rarely in females there is swelling of the ovaries, vulva or inguinal glands.

TREATMENT.—Keep at rest, use mild salines, purgatives. Locally warm oils, inunctions are grateful; opiates as in liniment or Lin. Camph. may be rubbed in and covered by flannel. In severe cases apply ice bag or leeches. Some apply hot fomentations. The orchitis requires elevation of the organ and opiate fomentations. Cerebral symptoms in young children are sometimes fatal in convulsions; leeching behind the ears or at the back of the neck, cut off the hair, and apply cold to the head and give purgatives.

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LVIII. METASTATIC PAROTITIS

Is called malignant, and accompanies a great number of acute diseases, such as typhus, typhoid, pyæmia, dysentery, yellow fever, etc. It is a bad symptom, signifies a blood poison or pyæmia, rapidly passes on to suppuration. It is a surgical affection, and treat as such.

LIX. INFLUENZA.

Called epidemic catarrhal fever—known for centuries. When an epidemic occurs it spares no one, so predisposing causes cannot be limited. The contagiousness of the disease has not been proved, as the disease is so rapid in spreading. It spreads exceedingly rapid over a country, and does not definitely follow the lines of travel, so it is concluded that the virus is wafted about in the air. There is a sudden onset, constitutional symptoms, etc.

SYMPTOMS.—Irritation of the respiratory mucous membrane, more rarely of the gastro-intestinal tract. The onset is sudden by a chill, often very definite. May be associated with general malaise. Temperature goes up a little, is higher at night. Sometimes the temperature is high and remains so for a short time, pulse 90 to 100, small and weak. Soon there are signs of catarrh of some part of the respiratory mucous membrane, hence a coryza even with epistaxis. Pharyngitis, hence hoarseness, swollen tonsils. Early in the disease a cough is set up, is troublesome and aggravating, comes on often at night; at first the secretion is scanty but freer later on. Examination of the chest may not find anything, although symptoms are like extensive bronchitis. The only adventitious sounds may be a few dry rales. With the cough there is a sense of dyspnoea. This difficulty in breathing is not associated with any change of the lungs. There is no hindrance to the passage of the air, and lung is intact, hence symptom is neurotic, an affection of the vagus nerve. Digestive system—tongue coated, anorexia, perhaps colic and vomiting. Nervous system—prostration from onset, patient goes to bed himself. Pains in the limbs, intense headache, sleepless, restless, may be mild delirium. Patient looks depressed and anxious, skin is dry with occasional sweating later on; often disease ends by cutaneous crisis.

PROGNOSIS.—Disease is short, 4 to 5 days, ends generally by a crisis, as diarrhoea, epistaxis, great flow of urine, or more commonly profuse sweating. Prognosis is favorable.

SEQUELÆ.—May be headache, cough, cases may loiter, or more severe than here described. During an epidemic the whole population may be affected, everybody out of sorts, coryza, heaviness, etc., but a certain percentage of severer attacks. Sequelæ are catarrh of conjunctivæ, catarrh of the ear, tonsillitis, laryngitis, pharyngitis, bronchitis.

CONDITION OF LUNGS.—During the attack these may be slightly congested, or bronchitis, yet often catarrhal or croupous pneumonia follow. Relapses are frequent. It is serious in the weak and aged on account of sequelæ. If person has emphysema or phthisis it is serious. If person had neuralgia the influenza will most likely bring it back; pregnant females are apt to abort, young women with amenorrhœa are often cured by this disease.

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TREATMENT.—Keep in bed, give mild diaphoretics, give stimulating expectorant and tonics. Morphia is good for the cough, steam inhalations for pharyngitis, for coryza use Morphia or Cocaine, use sol., and paint inside of the nose. In old people watch the lungs for complications. For prophylaxis, not much can be done, but those who are out the most in the weather are most apt to get the disease.

LX. SIMPLE CONTINUED FEVER

Is common and suggests severer forms, hence the value of being able to diagnose; it is recognized as being distinct from typhoid, typhus, etc., although some abortive forms of these are called simple continued fever. The term febricular is often used. It seems rare now, because typhoid is much better recognized now.

CAUSES, not satisfactory, do not suggest specific origin. Mental or bodily fatigue, exposure to cold or heat, or to the sun, over-eating, checking of secretions, worms in children.

ETIOLOGY is more frequent in children and young adults, is sporadic in temperate climates. A fever called ardent fever of the tropics seems to be of this type. It is not sunstroke.

SYMPTOMS.—Invasion is sudden with distinct chill. There are sometimes prodromata; following chill is a rapid rise of temperature with the usual symptoms of pyrexia, as headache, restlessness, anorexia, furred tongue, etc. Vomiting is usually absent, unless caused by over-eating. Severe muscular pains often felt, absence of cutaneous rash, except in some cases where bluish marks are seen, herpes on the lips and face, diarrhoea absent.

COURSE.—In mildest type called ephemeral fever or febricular; this runs its course inside of 24 hours usually. Ordinary case lasts from 4 to 10 or 14 days. Defeverescence is usually fast, not as rapid as the rise; is usually accompanied by a critical discharge, rarely epistaxis, or profuse sweating, uterine hemorrhages, also from nose. In children remissions are occasionally seen, so called infantile remittent fever.

PROGNOSIS is favorable except in old or feeble persons. In these, especially if in hot weather, the attack may prove too much. Ardent fever often ends fatally, or may injure for life, as by blindness, epilepsy, etc. In this case it is a symptomatic fever probably, as of a meningitis, no morbid poison is known.

MORBID ANATOMY.—No specific lesion; in ardent fever there is great congestion of all internal organs.

TREATMENT.—Expectant, light diet, acid drinks, a saline mixture. If caused by excess of eating give an emetic and purge. If fever continues high give Sod. Salicylate or Antipyrine; in ardent fever cupping or tartar emetic is used.

LXI. DIABETES

Is divided into Diabetes Mellitus, or Diabetes Insipidus or Polyuria.

DIABETES MELLITUS is often subdivided into two branches: 1. True diabetes, in which there is a persistent drain of sugar. 2. Simple glycosuria, in which sugar only appears in a transitory way, depending on temporary causes.

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True diabetes may be severe or mild in character. Fundamental symptoms are five: 1. Saccharine urine. 2. Excessive urine. 3. Excessive thirst. 4. Excessive appetite. 5. Emaciation. The invasion of the disease is insidious, so disease is overlooked, but exceptionally invasion is sudden. These cases are unfavorable, and run a rapid course. Frequent micturition is one of the first symptoms noticed by the patient, has to get up at night, the amount of urine is larger than usual; the thirst may be the first symptom noticed. A feeling of bodily illness may be noticed early by some, easily fatigued, finds he is losing weight, there is no excessive elimination of urea at the outset of disease. The appetite is capricious, but excessive in the early stage; later on appetite fails with nausea. The thirst is very great, even gallons drunk per day. Thirst in normal person is rare symptom, except in hot weather or in fevers, unless diabetes be present—always look for diabetes in thirsty persons. The water is retained in the system longer than in health. The quantity of urine is less than the water drunk. The skin is hot, dry, bowels costive, so the most of the water drunk leaves by kidneys; the breath gets a peculiar sweetish odor detected at the feet in bad cases. The saliva may contain sugar, the tongue is generally cracked and dry, and shews an angry, red appearance like in advanced typhoid. Dyspeptic symptoms are flatulence, eructation, etc.; emaciation is steady. Adipose tissue and muscles waste, even the alveolar processes are absorbed, hence the teeth get loose, sexual appetite fails, the countenance is depressed, looks low-spirited and despondent, they are petulant, irritable, are indisposed to much mental or bodily exertion, suffer from pains in the loins, extremities, with perhaps swelling of ankles. Patellar reflex is often lost early. A short, dry cough may give evidence of involvement of lungs, generally does. In the end patient generally sinks rapidly from asthenia, or suddenly from syncope, or diabetic coma or convulsions. Phthisis is a very common cause of death. Diarrhoea is an occasional cause, an acute inflammatory oedema of lung is commonest cause.

TEMPERATURE is always below the normal, in early stages 96.5 to 97, in advanced cases may be as low as 94. Evening temperature is 5 to 6 degrees higher than morning. There is no relation between temperature and quantity of sugar. The urine is passed in large quantities, 8 to 12 pints to even 20 to 30 pints per diem. The specific gravity is high, 1035 to 1045 to even 1070, but cases with specific gravity of 1015 are known. Reaction is acid strongly, contains 8 to 12 per cent. glucose. Average quantity sugar is 3 to 8 ozs. per day, is increased by starchy food, lessened by fasting, but does not disappear in advanced stages even on a wholly nitrogenous diet. Intercurrent febrile attacks may diminish or cause sugar to disappear. There is no deficiency in other normal constituents of urine. There is an increased amount of urea every 24 hours. This increase is proportionate to severity of disease, not entirely due to animal food. Uric acid normal, hippuric and phosphoric acids in excess, chlorine and sulphates increased too. Traces of albumen are usually found in advanced stages. Acetone is usually present.

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COMPLICATIONS.—Pulmonary tubercle is most common and serious, runs rapid course. Does not resemble the ordinary course of phthisis. Nearly 50 per cent. of cases which run to 3rd year have this complication. Pulmonary gangrene is very rare. Asthenic inflammation of serous membranes apt to end in suppuration, ulceration and gangrene. Above also in other tissues, hence surgical operations are apt to run very badly if diabetes be present, even a very small operation may be a great harm. Boils and carbuncles are very common. Cutaneous eruptions are common, as eczema about genitals. Failure of vision, actual blindness from retinal degeneration occasionally seen in advanced stages, Cataract is also seen in 10 per cent. of cases, begins in right eye, grows rapidly, etc.—is apt to be followed by suppuration if operated on. Impairment of smell or taste. Kidney affections, spontaneous gangrene of legs most often, but has been observed in nose, shin, lungs. Is a sure complication. (Edema of feet from anæmia. Catarrh of duodenum, hence jaundice occasionally. Sciatica is common. Eczema in genitals. Perforating ulcer of foot in latent diabetes may be a diagnostic sign. Is common in diabetes, do not operate for fear of gangrene. Contraction of palmar fascia, pruritis violent and persistent.

HEART COMPLICATIONS are important. Endocarditis may supervene after some time. Cardiac debility from atrophy of fatty degeneration of cardiac muscle. Dilatation of heart, hence dyspnoea, precordial pain, etc., especially apt to occur in stout people. In vigorous patients there may be hypertrophy, which persists if patient does not over-exert himself and takes exercise, etc., but ultimately dilatation ensues. As kidneys become diseased more heart work is needed, hence hypertrophy of heart. Arterial sclerosis is common, due to dilatation of vessels.

COURSE AND DURATION.—Runs a mild and slow course, lasting from 1 to 10 years, according to treatment. Hospital patients on account of want of intelligently conforming to diet do not last so long as a rule. An acute course is sometimes found, coma ending it. Is found in children and young people. A boy of 9 years died in 6 days, a child of 3 years died in 3 weeks.

Modes of death—several. Asthenia often preceded by pulmonary œdema, chronic phthisis, diarrhoea. Usual mode of death is by a sudden coma, found in $\frac{1}{30}$ th to $\frac{1}{3}$ rd of cases. This is the diabetic coma (or acetonaemia).

TWO FORMS OF COMA.—1. Syncopal—coma follows close on an attack of syncope. Patient becomes suddenly faint, oppression over heart, extremities cold, pulse rapid—130—and weak, soon pulse falls. Often great restlessness, but no delirium or dyspnoea, and patient dies exhausted, more or less comatose. 2. No stage of syncope. There is a sudden onset of sharp epigastric pain with vomiting and sometimes purging. At same time patient is seized with dyspnoea, a quick panting respiration (air hunger) not due to obstruction in air passages. Then comes restlessness passing into delirium, which is noisy. They may not last long. Then almost suddenly the restlessness and delirium cease and a profound coma ensues. This is a more common form than the 1st. Temperature at outset is not increased, pulse irregular, becomes weak, rapid, thready at onset of coma. In both forms odor of acetone is noted, urine highly acid. Violent

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convulsions sometimes appear, but are of uræmic origin, from kidney disease. Diabetic coma is not frequent in acute cases in young people. It seems brought on by emotions, constipation, or slight intercurrent disease.

MORBID ANATOMY.—If in acetonaemia there are fatty degeneration of heart and liver and milky appearance of blood from fat, with fatty emboli in vessels, appearances resemble phosphorus poisoning or acute yellow atrophy. Some think the coma is produced by presence of acetic acid in blood, found in alcoholic fermentation of glucose in blood, hence also the function of acetone. When acetone is excessive or kidney elimination fails, then acetonaemia with coma appears. Microscopic changes in nervous centres are said by some to be found in diabetes, no gross changes. These centres are firm, of natural vascularity or congested. A fine cribriform appearance like pinholes is found in cord. Larger cavities are seen in Pons. Sometimes central canal of cord is dilated. Tunnels (enlarged perivascular spaces) about the arteries are found caused by travelling of leucocytes from vessels. This causes loss of nervous substance. The boundary of brain substance is natural. Some say these changes are primary and cause the glycosuria, but others find similar changes in other wasting diseases. Liver may be normal, may be enlarged, or have undergone fatty degeneration, or may be atrophied, is sometimes seat of chronic hyperaemia, hence hypertrophic cirrhosis. Kidneys are enlarged and hyperaemic, the tubular epithelium is fatty, hence organ is soft. Lungs suffer frequently, not from typical grey tubercle, but a chronic consolidation occupying the lower part of the upper lobes instead of the very apex. Arteries—hyaline degeneration of vessels in interior of various organs, is also seen in typhoid, etc. Pancreas is often diseased. French writers think this gives a rapid course with diarrhoea with greasy stools. The pancreas shews atrophy of gland structure and increase in fibrous tissue.

PREDISPOSING CAUSES.—Age,—most frequent between 25 to 65. In childhood females have it oftenest, but from puberty upwards males have it oftenest. Hereditary influence is marked. Following neuroses, as epilepsy, etc., as well as diabetes itself, also phthisis. Exciting causes are not well established. Gout and rheumatism seem to predispose; anxiety, care, too much business worry, overstudy, etc., seem to act as exciting causes, also grief; cold and wet may be a cause, acute febrile affections, especially ague. Alcohol may occasion temporary glycosuria, excessive use of carbohydrates may cause glycosuria. Transient glycosuria may appear in course of asthma, emphysema, whooping cough where breathing is interfered with, also from inhalation of Chloroform in epilepsy, etc. It has been induced by injecting into the portal vein Na Cl Ether, Chloroform and Alcohol. Boils, gout, functional disturbance of liver has also caused it. Organic diseases of brain or cord, as apoplexy, tumors, myelitis, general paralysis have given rise to glycosuria and diabetes, also injuries to head, as concussion, or injuries to skull; other injuries, as fractures of vertebrae, blows on face, thorax, abdomen, contusion of liver or kidney. Diabetes is generally transitory, disappearing with cause. Since above produce temporary glycosuria, then an aldi-



tional cause must exist when diabetes becomes permanent. This additional factor may be a predisposition. Artificial diabetes has been caused by pricking vaso motor centre in floor of 4th ventricle. Division of lower part of medulla. Destroying centre of medulla. Destroying sympathetic nerves of vertebral artery. Dividing trunk of sympathetic in thorax. Removing superior cervical ganglion of sympathetic. All above caused diabetes. Above shews liver receives impulses, preventing in health glycogen being converted into sugar. 2. This force is not transmitted along whole length of cord, nor mainly by vagus. 3. Experiments shew influences from medulla go by sympathetic to liver, which also possesses independent action. Beyond the predisposition of age, sex, heredity, these other causes are doubtful. Usually diabetes develops without assignable cause. General theory is : 1, Pathological conversion of glycogen into sugar, or failure to assimilate sugar and convert into fat; 2, the supply of un-luly oxygenated blood to liver, due to vasomotor paralysis from injury of vasomotor nerves, is possible cause. Inhalation of Nitrite of Amyl has some effect. This undue supply of oxygen is illustrated, inhalations of oxygen produce glycosuria. So mental emotions, etc., may act through nerves or cerebral tumors or injuries, or peripheral stimuli of cold, blows, injury. This vasomotor theory is not yet established, but looks plausible. A definite neurosis may be the true nature of diabetes.

TREATMENT.—Difficult and unsatisfactory. Dietetic treatment is the most important. First point is to withhold sugar-producing food. Before beginning treatment recognize the true condition of the urine. Collect 24 hours' urine, estimate urea, specific gravity, etc, sugar. Then allow a diet free from sugar. Then in 2 weeks test urine again. If sugar has almost or altogether disappeared continue same diet for 2 months. If urine is yet free at end of 2 months from sugar, then attempt a gradual return to ordinary diet. If sugar still persists, resort to medicines. This dietetic treatment proves unsuccessful, for very few persons can tolerate a purely animal diet for any length of time. Vary the meat; first, meat, fowl, but patient gets to loathe the food, hence you have sooner or later to give something else. As substitute for bread, give bread made of bran gluten, almond flour, etc., and certain vegetables. Among animal, substances you may give animal soups, jellies, extracts, all kinds of meat, eggs, butter, fat, cream. Vegetables are mainly prohibited, also bread, oatmeal, arrowroot, rice, etc. Peas and beans are also objected to, beets are bad, turnips less so. Fruits as a rule are bad, all sweet fruits are to be excluded. Vegetables of cellulose with little starch may be allowed, so only give the green parts. Vegetables allowable are those which will add bulk to food with little starch, as cabbage and such like, spinach, lettuce, cress, green parts of celery, tomatoes, green parts of asparagus. Bran from husk of wheat is good. Gluten if obtainable is good. Make by washing starch out of flour, dry, grind, bake, etc. Diabetic flours as sold are unreliable. Rusks and biscuits made from starchless meal, flour from sweet almonds makes good cakes. Nuts except chestnuts are allowable. Milk skimmed and butter-milk, sour milk, are good, although lactose is present in 5 per cent.

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A skimmed milk diet is recommended by some, give nothing else as in chronic Bright's. Must be given exclusively, start early. But few persons can stand it for over a week. Those who can, either starve or get well—the latter from semi-starvation (Brunton). Do not allow more nitrogenous food than can be used, else kidneys will be overtaxed. Drink should be tepid; tepid drinks will allay the thirst better than cold, although not as palatable. Give tea, coffee without sugar. Beat an egg up in either, it replaces milk—a little milk may be allowed though. You can sweeten it with a little "saccharine." Cocoa nibs are also allowable, do not use chocolate. Do not use alcoholic drinks, is better without, unless in middle-aged man, who is reduced, and has been used to spirits. Whiskey is best, well diluted—claret, hock are also allowed. Mineral waters, Bethesda water (Wiesconsin), not beneficial exactly, but do not harm. Vichy and Carlsbad are also used. An acid drink of Lactic Acid and Glycerine and Tr. Aurantii, equal parts. Take 1 oz. of that to 1 pint water. Phosphoric Acid Dil. is also used. Do not drink more than necessary for thirst. Medicines—Opium or some of its preparations diminishes sugar appetite and thirst. Does not assist producing diabetic coma. Begin administration gradually as gr. 1 at bedtime, increasing gradually till sugar disappears, or sugar ceases to reduce. There is a tolerance of Opium in diabetes, $\frac{1}{2}$ oz. of Battley's has been taken every night for 2 years. Even gr. 3 of Morphia, or gr. 10 Opium, or gr. 9 of Codeia have been given T. I. D. Dr. Pavy prefers Codeia to Opium. Begin with gr. $\frac{1}{2}$ T. I. D. It is less apt to produce headache, nausea, constipation. Increase by gr. $\frac{1}{4}$ th rapidly until gr. 3 to 6 per day are given. Give in pill or in sol. with Casarea. Solution of Binneconate of Morphia may be used. If sugar disappears for 2 months after the diet, very cautiously allow 2 to 3 oz. of bread or its equivalent night and morning; watch effect on urine. If sugar does not disappear it may be necessary to give vegetable diet to keep patient from running down. But do not give excess of starches, do not give potatoes. Increase the Opium when you return to mixed diet in this case. Ergot $\frac{1}{2}$ dr. to 1 T. I. D. is sometimes useful. Should theoretically be valuable for action on vessels. Arsenic and Strychnia, Iron are given, but above are not successful. Arsenic in certain preparations is good. Clement's Bromide of Arsenic is most satisfactory, give gr. $\frac{1}{16}$ th T. I. D. at first, gradually increased until gr. $\frac{1}{4}$ th to $\frac{1}{2}$ th per day is reached. The dietary treatment is continued also. This Arsenic is specially adapted to neurogenic diabetes in early stages. Sod. Salicylate has been much used, especially in constitutional diabetes and especially in those of gouty or rheumatic diathesis—excess of uric acid in urine. Dr. Ross has not found this good. It is important to correct any defects in action of stomach, liver, skin, kidneys, etc., therefore use of digestives, as HCL or Pepsine, especially useful in old people in whom digestion is weak. Alkalies are favorites, as Sod. Carb. and Sod. Am. and Sod. Phosph. after meal in water, hence benefit at springs. Vapor bath is recommended on account of action on skin, hence also wear flannel, take exercise, use friction to skin daily, etc. Lactic, Carbolic Acids, rennet sugar have been used



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as remedies. Ac. Carb. has been extensively tried, on supposition that disease was due to increase of ferment in liver used in converting glycogen into sugar—not proved. Iodoform has been tried, no good, not safe, it lessened urea, also sugar and thirst.

HYGIENE.—Protect surface from exposure, give regular exercise in open air, wet or dry, more particularly in fat persons. Give cheerful surroundings, seaside is good. Massage is beneficial in want of exercise. Long railway journeys are not safe.

TREATMENT OF D. COMA.—If urine become much more acid, or if the urine and sugar suddenly become reduced, if lips become livid, then coma threatens. Then administer alkalies freely, and hot vapor bath and purgatives are useful. If coma sets in in spite of remedies, still try hot air bath to make skin act, and give diffusible stimulants, as Alcohol, Ether, Valerian, Camphor. If these fail, perform venesection and transfuse saline fluid of 1 per cent. Sod. Carb., 5 per cent. neutral Sod. Phosph. If syncope comes on, rely on cardiac stimulants, but little avails as a rule.

TESTS OF URINE.—If doubtful of copper tests employ the yeast test, for uric acid, etc., will reduce copper in absence of sugar. Robert's yeast test—take 2 bottles, 8 to 12 ozs., put 4 ozs. urine into both, put lump of yeast into one, leave mouth of this open, and seal the other, place both away for 24 hours at 80 to 90 deg., then put for 2 hours in cool place, then take sp. gr. and difference in degrees equals 1 grain of sugar per oz.

DIABETES INSIPIDUS—Polyuria, Diuresis, Polydipsia—may come on insidiously. Is characterized by secretion of enormous quantity of limpid urine, 20 to 60 pints of low sp. gr. 1002 to 1004, slightly acid, free from glucose and albumen. It contains normal or diminished or excessive amount of solids (call former two "Aduria," the last "Polyuria"). Total amount of solids generally is in excess, urea especially. Sulphates and Phosphates increased. Inosite is found (muscle sugar). Sometimes traces of sugar are found,—a hybrid case. Skin is dry and harsh, mouth dry, bowels often constipated. General health may be good, but if case be severe and of long standing, patient loses flesh, gets anæmic. No excessive appetite. Severity of disease generally declines towards death. This disease may last for years in apparent good health, virility all right. Others—young, may have arrested development.

DURATION.—Usually lasts many years, has ended in 4 months. A complication generally carries off, as pneumonia. Uremic coma from affection of kidneys sometimes appears.

PROGNOSIS.—Is seldom cured, but disease is not incompatible with long life. If appetite be excessive, prognosis is not favorable. In some few cases disease has passed into Diabetes Mellitus.

ÆTIOLOGY.—Predisposing causes—includes all ages. More frequent in males, 2 to 1. Is most common in adults, 20 to 50; but all ages may be affected. Hereditary—neurotic temperament, etc., predisposes. Exciting causes,—

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irritation of area in 4th ventricle above auditory nuclei, close to diabetic centre, will cause Diabetes Insipidus, so will injury to middle lobe of cerebellum. Section of sympathetic trunk in thorax or splanchnic nerve, or of vagus, and stimulation of its peripheral end, a powerful mental emotion, tumors of brain or cord, blows on head, pressure on vagus or splanchnic nerve, neuralgia, hysteria, etc., seem connected. Alcoholic indulgence, exposure, etc., are said by some to act. Above shews strong relationship to Diabetes Mellitus.

MORBID ANATOMY.—No constant lesion found, kidneys and brain oftenest affected, as kidneys atrophy or generally congested, etc. Gross lesions of nervous system are often found, as growths, etc., congestions. Excessive secretion of water may depend on dilatation of renal blood vessels, hence increased pressure in glomeruli, with excessive secretion, caused by vasomotor paralysis, due to action of splanchnics.

CONCERNING DIAGNOSIS.—One condition which might lead astray is the polyuria, often noted in hysteria. It may occur in nervous people without common hysterical symptoms, look for them. There is a slight polyuria due to renal "inadequacy," urine also of low specific gravity. The urea is reduced in amount, and there is never excessive polyuria. The polyuria of Chronic Bright's is known by albumen, casts, hypertrophy of heart, etc. The hydruria of hydro-nephrosis is intermittent, is rare, etc.

TREATMENT.—Treatment is empirical and unsatisfactory.

DIET.—Generous, do not try to reduce the quantity of water too much, it is impossible, but moderate the quantity. General health should be put right. A course of Pot. Iodide is given, especially if you suspect syphilis; Ergot and Belladonna have benefited. Jaborandi or Pilocarpin or Ac. Carb. Large doses $\frac{1}{2}$ oz. Tr. Valerian T. I. D. have been used. Nitric Acid has also been tried. Opium is not much or any good in this form. Look for a special cause of disease as syphilis, intercranial growths (give Pot. Iodide). For malaria give Quinine.

LXII. GOUT

Is divided into regular and irregular forms. The irregular gout has many names,—atypical, latent, etc. Regular gout may be called gouty arthritis. Irregular gout may be called lithæmia. Gout may be acute or chronic.

ACUTE REGULAR GOUT.—Before seizure there may be premonitions, commonest is in reference to digestive system as indigestion. Sometimes it is cardiac, and uneasiness, inability to lie on the left side, fluttering of heart, palpitation, dyspnoea, etc. But dyspeptic premonitions are commonest, and cardiac symptoms are probably reflexes. When gouty diathesis is well declared by previous attacks there are always peptic disturbances, as flatulence, heart-burn and constipation. Urine becomes scanty, turbid, deposits lithates. Perspiration may be suppressed, skin dry, contra to rheumatism in which perspiration is profuse—a rash even, as nettle rash. In many cases there are no premonitions.

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THE ATTACK—It is generally sharp and sudden, occurring during the latter half of the night. There is severe pain in one of the toe joints, especially of the big toe (Podagra). Pain is severe lancinating. Part feels stiff. Intense severity is rapidly attained, foot is tender, cannot bear the weight of the clothes. After a few hours part becomes swollen, purple or covered with red rash like erysipelas. Veins become distended, the saphenous veins get hard and distended.

CONSTITUTIONAL SYMPTOMS.—Inability to sleep, restlessness, fever; symptoms increase till the morning, then perspiration appears, and pain begins to subside and patient sleeps. This anchoration lasts all day till after midnight, when a return of symptoms appear. In very severe cases no remissions of pain occur even for some days. Gastric disturbance is marked. There is fever, and pulse is rapid, urine is scanty, high colored, and contains less uric and phosphoric acid than in health. Urea is above normal. Bile may disappear from stools. Attack in foot is the least painful and safest of all attacks, as in hand, shoulder, nape of the neck, fauces, stomach and diaphragm.

DURATION.—Duration of the 1st attack is from 2 to 12 days, subsequent attacks are prolonged even to 3 months. After an attack, patient enjoys good health, better perhaps than before. But sometimes the other foot or hand is attacked, peptic symptoms remaining. If patient takes care of himself he may not have another attack for 3 to 4 years. It may return speedily if first attack be at 40 years, a young subject, but not so speedily if in older men, is less apt to become chronic. As case progresses the intervals become shorter till an attack in a year is looked for, till at last gout is always present. Condition becomes chronic. When patient feels good between the attacks it is called 1st stage of gout; but when he does not recover between the attacks and finds he is losing strength it is called the 2nd stage. Attacks are more frequent but not so severe. Ligaments—fibrous tissues become involved, hence loss of elasticity in gait, etc. Appetite now is lost, digestion weak, hence craving for condiments. Heart suffers at last functionally with palpitation, intermittency of pulse, faintings, cough. Complexion loses clearness, looks muddy, eyes blurred, lips blue, venules seen on face. In last stage no decided attack is experienced, but disease is always present, has become chronic. Dyspepsia, cardiac complications, sense of exhaustion, etc., are aggravated. Stimulants are craved for. Gait is tottering, vertigo, failure of memory, timidity, listlessness, all denote loss of nerve tone.

IRREGULAR GOUT (LITHÆMIA).—Marked, atypical, atonic, etc. First shews itself by various forms of dyspepsia, especially by gastrodynia, flatulence, constipation, urine deposits lithates. The nervous system suffers most, and the patient has all sorts of sensations, vague, inexplicable. Nervous sense of general uneasiness, feels out of sorts, but cannot say definitely what it is. Patient is gloomy, perhaps hypochondriacal. Pains are frequent and painful in scalp or occiput, hemicrania, stitches in the side, shortness of breath, dyspnoea with bronchial expectoration, resembling asthenia. Any or all of these symptoms may be therefore a long time before definite symptoms appear. A paroxysm of regular gout

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at last may appear and relieve these symptoms, but sometimes it increases them. This gout is less painful than the regular gout, but it is more tedious and difficult to treat. If regular gout is transferred from a limb to a viscus, thus if it invades stomach, there are violent cramps, hiccough, faintness, vomiting, even of a coffee ground material, or even actual hemorrhage. It may be more chronic, as gastralgia with flatulence, acid eructations, hiccough. Gout may affect head, hence apoplexy or stupor in which sight and hearing are retained, but consciousness lost, cannot understand a long sentence. But these signs are all preceded by violent headache, drowsiness, etc. When heart is seized, the symptoms are of angina pectoris, constricting pain, dyspnea, palpitations, syncopal state, etc. Sometimes the attack is like syncope, may be fatal, or there may be faintness and anxiety with the irregular heart. Is a treacherous state. Neuralgia may be gouty ditto. Headache, epilepsy, hysteria, iritis, eczema, psoriasis, prurigo may be also due to gout, especially eczema, which may even alternate with gouty attack.

THE JOINTS.—After the first few attacks the joints recover their natural ability and usefulness, but after a number of attacks permanent damage results, joints remain more or less swollen and weak, movements impeded and even actual deformity results. The effused material becomes mortar-like by absorption of fluid, hence chalk stones (Tophi). This is deposited in cartilages and ligaments, forms excrescences about bursæ and the cartilages. These deposits are frequently found in cartilages of the ears, and they are valuable for diagnosis. When fresh attack occurs more exudation occurs, swelling increased, etc. Skin gives way and chalk stone is discharged. Suppuration may continue for weeks or months, but outwardly this heals. While suppurating, patient is in good health.

GOUTY MANIFESTATIONS.—Gouty bronchitis, G. asthenia, G. tonsilitis, G. pharyngeal catarrh, G. intestinal catarrh, G. urethral or visceral catarrh, G. cirrhotic kidney, G. diabetes. Vascular system suffers, hence asthenia—veins of lower extremities are attacked by symmetrical adhesive inflammations. The same of the heart. Examination of blood in urine is important in pathology.

BLOOD.—Normal constituents are not changed, but in old cases specific gravity is lower than health and reaction is not so alkaline, the main difference is that uric acid is in excess. Urea may also be in excess. Normally it needs care to find these two. Serum from blisters or serous effusions into cavities have excess of uric acid. A blister over an inflamed joint will not have excess of uric acid, it going to the inflamed joint. Uric acid in blood does not always cause gout, for it is found in pyrexia and different fevers, etc. The urine in gout—in early stages the amount may be normal, but the solids are increased, hence specific gravity is 1030 to 1035, and the acidity is increased. Calcium oxalates, etc., may be deposited in the kidneys or ureters, hence renal or visceral symptoms. For short time before attack of gout there is lessening of all chief solids in urine, especially uric acid, phosphates, etc. During attack the urea is about normal, quantity of urine scanty, acid, etc. Albumen is not uncommon. As attack subsides uric and

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phosphoric acid increase. In later stages of chronic gout the urine is pale, low specific gravity, and quantity increased, uric acid diminished, urea about normal. A small amount of albumen occasionally is found, granular casts, etc., even sugar. Casts may be found with albumen in acute paroxysms, and casts without albumen may be found in gouty patients. It is not shewn whether it is a lessened formation of uric acid or its precipitates in joints, and thus lessening urine, or from deficient excreta, that it is lessened in urine in attack.

ÆTIOLOGY.—Predisposing causes,—heredity, important, 50 per cent. have history, but a generation may be skipped. It occurs earlier in life if inherited.

SEX.—Males have it oftener, much so; females have it mostly after menopause, and it generally appears after maturity and before decline. It has occurred in childhood, even in infancy. From 30 to 40 years is most frequent time.

ALCOHOL.—It is most potent predisposing cause of gout, even the essential cause. The fermented liquids are most potent. Thus Scotch and Russians drink spirits, and gout is rare, so quantity of alcohol is not the point. London laborers drink porter, and suffer greatly. The stronger wines are more injurious than lighter wines. Porter and stout rank next to wine. The disease is commoner in beer-drinking countries—Bavaria, England. The heavier beers are the most injurious. Even cider in large quantities may cause gout. Beverages which have a diuretic tendency have less action to cause gout. Persons who indulge in heavy wines are generally heavy eaters of animal food, etc., all tending to produce gout. Not enough exercise is taken to oxidize food taken, hence blood gets loaded with effete material. Dyspepsia is a common cause of gout by excessive eating and drinking and indolent habits, so excessive food is a cause. Mental efforts, severe and prolonged, act in depressing manner, and so bring out the hereditary taint. Climate—disease is not known in tropics. Occupation—gout is common in lead workers. Women employed in lead works get lead colic rather than gout. A sudden increase in any one cause will bring on an attack of gout in one who has one of above predisposing causes in operation, as a spree or attack of indigestion, nervous exhaustion, etc. These then act as exciting cause.

EXCITING CAUSES.—Cold or moisture, local injuries to joints, depressing diseases.

MORBID ANATOMY.—Nature of gout is still under discussion. The general view is that there is a materies morbi in the blood which causes the disease. This material is either uric acid or something like it, a product of secondary assimilative processes, as in liver, tissues, etc. Thus excess of uric acid as urate of soda is always in blood at time of attack. The morbid effusions into joints contain urate of soda, and as attack passes off this salt is in urine. There is diminished excretion of this salt during attack. Predisposing causes tend to form this salt or acid. Causes reducing alkalinity of blood tend to induce an attack, as use of acid liquids. There may be a peculiar mode of vital action transmitted by heredity, which causes aptitude for formation of uric acid in excess. Garrod

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says urate of soda is deposited in the least vascular parts where circulation is sluggish, hence in cartilages and ligaments. A neurotic theory was proposed a few years ago, is an old view revived, is not accepted. One of the functions of liver is formation of urea—if unable to do so uric acid is found, hence liver may be cause of gout. Birds and reptiles have uric acid instead of urea formation by liver, hence a functional defect of liver may be the transmitted tendency. Impairment of kidney, hence retention of uric acid may be a cause. Why does not uric acid in blood always cause regular gout? Joints affected. This is not explainable. But injuries to foot or pressure on foot from being on feet all the time, hence a supposable traumatism, may predispose to attack in big toe gout. But Quinine is a poison to some, does not affect others, hence action of uric acid may be secondary to patient's idiosyncrasy in like manner.

TREATMENT.—First, during attack consider age, previous attack, etc. Diet is antiphlogistic—sago, arrowroot, milk, etc., and mild alkali fluids. No animal food is allowed. Alcoholic drinks are to be completely cut off. As disease declines, gradually increase the diet, giving fish, fowl, etc., before the red meats. Alcohol had better be avoided, unless in the weak; spirits, well diluted, will be better than malt liquors or wines, these should be cut off. If much fever, keep patient in bed lest over-exertion or exposure should cause disease to attack some of viscera. Commence treatment by good purge to unload liver, as blue pill or pill Colocyth, etc. If constipated during progress of case try Musbarb, Colocyth, etc, give Tr. with some aromatic. As disease declines give milder laxatives, as in later stage of gout; purgatives are borne badly, inducing syncope. The neutral salts associated with vegetable acids are also given, enough to cause diuresis should be given. Being converted into carbonates they make blood more alkaline, they also allay pain, etc. Give $\frac{1}{2}$ dr. doses of citrate, tartrate and lactate. Soda Bicarb gr. 10 in Infus. Buchu. may be given every 6 hours with Phosphoric Acid. Alternate the salts. In debilitated persons or in atonic gout give these neutral salts combined with vegetable bitters, as Gentian, Calumb, Cinchon., etc. Give these salts as attack is beginning to decline. The alkalies and the earthy carbonates are not as good as the neutral salts. Colchicum is the great remedy. Its mode of acting is not known. It does not increase elimination by urine, nor does it always act by elimination. It may act as a purgative, but not necessarily. It is a powerful anodyne in gout, but when even well given does not shorten interval between the paroxysms, but does not render disease chronic. It shortens the paroxysm only. It is most applicable to regular gout with no visceral complications, so is useful in early gout. Affords less relief in atonic gout. May cause depression unless combined with vegetable laxatives, as Rhei, Aloes and Aromatics, as carminative. Colchicum is best given, as acute stage or onset is well marked by swellings of joints, etc. Dose m. 10 to 15 of Tr. or Vin. Colchici T.I.D. Watch its effects lest it cause depression, nausea, vomiting, diarrhoea. The paroxysm at onset of attack may be so severe with high temperature, then give Colchicum in small doses at once, gtt. 5 T.I.D.



Vin. for some time. The wine m. 5 to 30 is the best form, the Tr. same dose is also good, also the Acetic Ext. gr. $\frac{1}{2}$ to 2. Colchicum is often combined with Antacid Aperient and vegetable bitters as:—R. Vin. Colchici gtt. 10, Pot. Biarb. gr. 15, Mag. Sulph. dr. 1 or Pot. Iod., Inf. Buchu. 1 oz.—6 q. h. Salicylate of Soda is next to Colchicum, in gr. 15 doses 3 q. h. reduces violence of attack. Continue dose for several days, reducing quantity. Oil of Wintergreen also. Salicylic Acid also is good in dyspnea of gout. If to be taken for a long time give Salicin. Lithia Carb. and Liq. Pot. are highly spoken of. The K dissolves the uric acid.

THE SUBACUTE FORM.—Pot. Iod. is often good, it reduces the swelling; may also be given in acute cases. It is a solvent of Uric Acid. Tr. Iod. and Tr. Galls aa, paint on swollen joints, is good.

LOCAL TREATMENT.—Cotton wool over joint covered with oil silk is good, but in some cases no covering is borne. If great pain add Anodyne to application and Alkaline lotion. Anodynes, as Belladon., Opium, etc., Colchicum and Battley's Sol. and Glycerine, equal parts, makes a good application. Elevate the limb. Do not use leeches or cold, they tend to favor metastasis. In asthenic cases use small blisters over affected joints.

IRREGULAR GOUT TREATMENT is different, delay is not followed by bad consequences. Some causes will excite an attack, hence avoid these causes. Cases attended by little change in pulse, although there be great pain, vomiting, etc., best bear delay; but in cases where heart's action is depressed, aid must be prompt. Metastasis of gout to head needs smart purgative, cold to head, small doses of Colchicum. Metastasis to heart—valves are calcareous, or heart is fatty. Colchicum is not safe in such a case, even purgatives are to be avoided. Use only the mildest laxatives—important. Stimulants (alcoholic) are useful, also Ether, etc., and Digitalis carefully given. In gouty bronchitis Pot. Iod. gr. 5, Pot. Biarb. gr. 10, Vin. Colchici m. 10, Sennae Fld. Ext. m. 20, diluted, 4 times daily. In stomach gout we give emetic at outset if stomach contains food, then give Colchicum, Tr. Opii, Salicin. If this fails give sharp dose of brandy. Counter-irritants to epigastrium all good. Their application to extremities seems to draw attack to extremities from the viscera. Gout dyspepsia—for it give R. Pot. Biarb. gr. 15, Sod. Salicyl. gr. 5, Tr. Nux. Vom. gtt. 10, Inf. Calumb. 1 oz., before each meal, followed by drink of water.

TREATMENT in intervals of prophylaxis: 1. Frugal diet; and 2, plenty of exercise. Most definite cures have followed on following both above. Regulate exercise according to condition of heart. Care is needed on these points. A low diet is not suitable, nor a vegetable diet. Starchy and saccharine foods are to be avoided, as in diabetes, as they are apt to cause flatulence and dyspepsia and acid—a frequent cause of attack of gout. You may even need to prohibit sweet or acid fruits. Drinking 2 to 3 tumblers of hot water per day is good. Vegetable diet is less easily digested than animal diet. Men with mental work require animal food. Diet should have excess of animal food, but quantity of meal must be small. There must be no excess of food eaten. A diet much like diabetes,

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only not so strict on exclusion of starches. Fats are allowable. Exclusive milk diet may cure obstinate cases. Wines, beer, etc., are to be avoided altogether. In case of the aged who are used to alcohol, a little may be allowed, giving light wines, dry sherry, old whiskey, no fermented liquor. Remedies for gouty habit, which will eliminate uric acid, may be given in small doses on an empty stomach well diluted, as Pot. Acet. gr. 15. Sod. Sulph. is valuable, or Am. Sulph. (Phosph.), if skin be affected. Lithia Carb., gr. 1 to 5 and Cit. Lithia are good, cause disappearance of gravel and prolong intervals, are prophylactic against gout. Give them largely diluted in aerated or plain water. Lithia taken for long periods does not cause ill effects. Tr. Iod. m. 10 in Glycerine T. I. D is recommended by others. Natural mineral waters act as salines, and have change of air, scene, occupation, etc., in addition. But mineral waters are not suitable if there are visceral complications, or in an active or impending attack. Alkaline Saline Springs Vichy vary in constituents. Send robust patients to such. Purgative waters are good with torpid liver—as Carlsbad. Sulphur springs when skin is inactive—Aix le Chapelle, Caledonia Springs. Saline waters where there is want of vascular action. Thermal springs for weak patients. Great judgment is needed in deciding on what spring will suit. No cure is effected, merely a relief.

LXIII. RHEUMATISM

Is divided into articular and muscular, although other parts, tendons, tendon sheaths, fascia, periosteum, etc., may be affected. In very rare cases there are chills, fever, and direct attack on endocardium or pleura without involving joints. Saliva in rheumatism is acid distinctly. Urine is very acid, scanty, high colored, etc., with heavy brick dust deposit of lithates. Perspiration is acid.

CEREBRAL RHEUMATISM is term applied to cerebral disorders observed. Is chiefly functional, as delirium, coma, convulsions. Delirium is important. Usually without subsidence of articular pain, about 8th to 12th day, patient becomes restless, irritable, sleepless, then comes on delirium, either of wayward or taciturn kind, or more frequently furious, even maniacal. There is seldom any headache, no disorder of special senses, but there is evidence of extreme prostration. Pulse very fast and small, face pale and cyanotic, or even syncope. If recovery does not occur, patient rapidly sinks into asthenia, coma. Temperature is very high in delirium, 106 to 110, skin is hot and dry. Tongue dry and brown. Death may be from 6 to 7 hours to 2 to 3 days. There is a chronic form of delirium which may pass into melancholia. Apoplexy, characterized by coma and collapse, but no paralysis may occur; is fatal—rare. Spinal symptoms are manifested by convulsions; choreic movements, etc., usually succeed the delirium. Simple chorea may precede, follow or alternate with rheumatism in young people. A vulnerable state of nervous system, inherited or acquired, usually is present, those cases which have delirium. 2. Existence of complications, endocarditis have influence on nervous system. 3. The hyper-

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pyrexia has also an influence on nervous system, hence may be a cause, so use of antipyretics may remove the delirium with the pyrexia. In rare instances a rheumatic meningitis occurs. In some of these cases the meningitis is due to ulcerative endocarditis producing embolism in meninges, hence fresh form of inflammation. But in other cases it is supposed to attack meninges just as it does the endocardium. The symptoms are striking. The vomiting and pain in head are not well marked, the vomiting may be absent altogether. The delirium sets in suddenly and runs to stupor. The most dangerous of all complications is acute lobar pneumonia, it does not limit itself, tends to spread, etc. A severe pharyngitis or a tonsillitis may precede or occur in the attack. Often tonsillitis seems the first symptom of approaching rheumatism. About 3 to 4 days when temperature should go down it does not, but pains in joints are noted, hence use salicylates in tonsillitis. Cutaneous affections often complicate, sudamina at least, also various forms of erythema (*marginatum nodosum*), urticaria, rarely purpura, scleroderma. Local oedema is common, even phlebitis. Subcutaneous nodosities seem common to rheumaties, one loose, attached to fascia, size of pea to almond, found chiefly about back of elbow, malleoli, crests of ilia, etc. Last from few hours to some months, indicate deposits of mate of soda, come out in crops, no inflammation about them. For full account of rheumatism see folio 32.

LXIV. ANÆMIA.

Simple, chlorosis, pernicious anæmia. The size or number of the red corpuscles does not tell the relation of hæmoglobin to the blood, hence use of the color test with a standard colored solution. By this the hæmoglobin has been found as low as from $\frac{3}{4}$ th to $\frac{1}{4}$ th of the normal. For above see folio 46.

For Leucocythæmia and Hodgkin's Disease, see folio 52. Hodgkin's disease may need diagnosis from carcinoma. There is also a benign form of glandular enlargement called lymphoma. Lymphosarcoma is also another state to be diagnosed from, especially in those cases of Hodgkin's where the retroperitoneal glands above are involved.

Addison's Disease, see folio 56.

Rickets, see folio 42.

Acute Gastritis, see folio 174.

LXV. CHRONIC GASTRITIS.

May follow on an acute or subacute attack, is very intractable, an inflammatory dyspepsia—some speak of it as "mucus flux"—a catarrh. But oftener this chronic form is an entity of itself, dependent on some mechanical lesion affecting circulation, especially of portal circulation. This is usually secondary to other disease as chronic bronchitis, emphysema, cirrhosis of liver, chronic gout, chronic uræmia, plithisis—this last is the most frequent of any one cause.

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Repeated and frequent use of spirits, especially of undiluted spirits, is a well-known cause, and diseases of the circulation. Frequent drinking during the day, as of tea, etc., weakens stomach. Indolent and sedentary people are more subject to gastritis than others. Middle age, 40 to 50 is commonest age. This form attended with acidity is rare below 20. Plethora predisposes. Do not use tobacco. Other direct exciting causes are: use of food which does not agree, over-eating, especially of meat, especially if health be impaired. Defective mastication also favors. Chronic gastritis is often secondary to disease of stomach itself, as pyloric obstruction, ulcer, cancer, etc.

SYMPTOMS if severe, that is if large area of mucous coat be affected, for such may not be the case, the symptoms vary, are not persistent, intermissions followed by exacerbations, etc. Uneasiness about epigastrium, tightness and weight coming on $\frac{1}{2}$ hour after eating, and lasting till digestion is through. But some cases are relieved by eating, others aggravated by empty stomach. There may be a craving for food, but the sick feelings induced lead to avoidance of food. They desire highly spiced food. There is no fever, but a good deal of thirst. Pyrosis (water brash) is frequent, raising this colorless glairy fluid long after taking food, especially in morning, often giving great relief. Vomiting is not present, but nausea is common, especially in morning. No appetite in a. m. The vomited matters are rarely frothy or fermented, but may be sometimes with tarula, etc. Flatulence is frequent, a sensation of spasmodic constriction about stomach, despondency.

HABITUAL ACID ERUCTATIONS, specially after meals, is a marked symptom. Bowels constipated, stools lumpy. *Sarcina ventriculi*. Urine varies, is frequently alkaline and cloudy, tongue is variable, moderately furred, with red papillæ at tip and edges. In severe cases it is red and raw. It will look normal, especially if the cause of the disease is from chronic venous congestion. Aphthæ are common on the tongue in phthisical cases, gums red and spongy. Fauces dull, red and congested. Laryngeal catarrh common with husky voice, the complexion acquires a dull pasty look. If the disease lasts a long time patient loses flesh, with cold extremities, weak heart and a pale, dry skin. Hæmorrhoidal congestion. Persons subject to chronic gastritis are subject to subacute attacks (bilious attacks). In certain cases the irritation of the terminals of the vagus in the stomach is conveyed to the brain, hence a change in the disposition, irritability, feelings of languor, listlessness, sleeplessness, palpitation of the heart, are inclined to be depressed in spirits, even hypochondriacal. Exceptionally the vomit contains what looks like coffee grounds, but is really altered blood from diapedesis of congested vessels or even from superficial ulceration.

P. M. CHANGES.—Increased vascularity of the mucous membrane, some vessels are permanently distended, certain portions are of a grey or slate color, or even black from the altered pigment. The mucous membrane is generally thickly covered with mucus and definitely thickened. In some cases the

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membrane gets tough and hard. Fatty degeneration shews as white spots. Mammilation found near the pylorus. There is an increase of the interstitial tissue leading to fatty degeneration of the glandular structure in parts. Some divide disease into two forms: 1. Chronic intertubular form. 2. Chronic tubular form.

TREATMENT.—Regulate the diet, and give medicine to relieve the congestion of the stomach, then give it rest; milk diet is the best, rendered alkaline by one part in 4 parts of milk of lime water. If the milk is allowed to coagulate in stomach it is at once covered by mucus and is not digested. Alkalies in the milk rests to some extent the stomach by aiding digestion. A skim milk diet for 6 to 7 weeks with no medicines will cure a good many cases. In any circumstances try milk diet for 2 to 3 weeks. In giving it take a wineglassful at a time and take it frequently, so that 2 quarts is taken in a day. With some you can add a little starchy food, but some stomachs do not like it, then try raw eggs or powdered meat in its place in small quantities. If milk will not agree at all, peptonize it. As soon as improvement begins allow a little stale or toasted bread, beef tea, and later allow light foods, poultry, etc. After exclusive milk diet for 2 weeks, Dr. Delafield allows one meal a day of meat alone, later on adding vegetables, reducing the milk. Any food which disagrees is to be avoided. Starch, sugar, etc., may cause acetie fermentation. No one kind of food will agree with every one. If you can find out a cause for the disease then treat it: thus, if it is cardiac, *Digitalis* may; if constipation causes it, then give purgatives. For direct medicinal treatment the alkaline carbonates seem to be good; if constipation exists then the alkaline mineral waters are good, especially if taken at the springs, as change of air, etc., does good. Rochelle Salts and Sod. Phosph. may be substituted, of course at the same time regulate the diet. A common plan is the use of hot water. This is $\frac{1}{2}$ pint of very hot water taken about an hour before breakfast. If acidity is marked add a little Sod. Bicarb. Some take it before each meal, diet must be regulated. A little Calomel occasionally aids. In feeble persons, the congestion had better be relieved by stimulating the bile, hence Tarax and Soda and a pill of Podophyllin, followed in the forenoon by mineral water. In taking a mineral water for purgation you take it all in a draught; if for hepatic stimulant, sip it. Sod. Salic. is recommended as a powerful cathartic stimulant. If marked acidity, give Sod. Bicarb. If it does not cure, it relieves the symptoms. A good way to give is in the form of lozenges. Powdered charcoal is good, also Glycerine if there is much flatulence. Take charcoal in lozenges or milk. Glycerine in dram doses in a little water is very good; do not allow constipation. Give Aloes, Nux Vom., Belladonna, etc. Washing out the stomach with plain warm water is much recommended. The water may be medicated with Carbolic Acid, etc. Wash as long after a meal as possible. Use once a day for 2 to 3 months, gradually reducing the number of times for 6 months. Try it in obstinate cases. In aged or enfeebled persons, supply artificial juice, pepsine is the foundation. The mineral acids are very useful, especially Hydroch.

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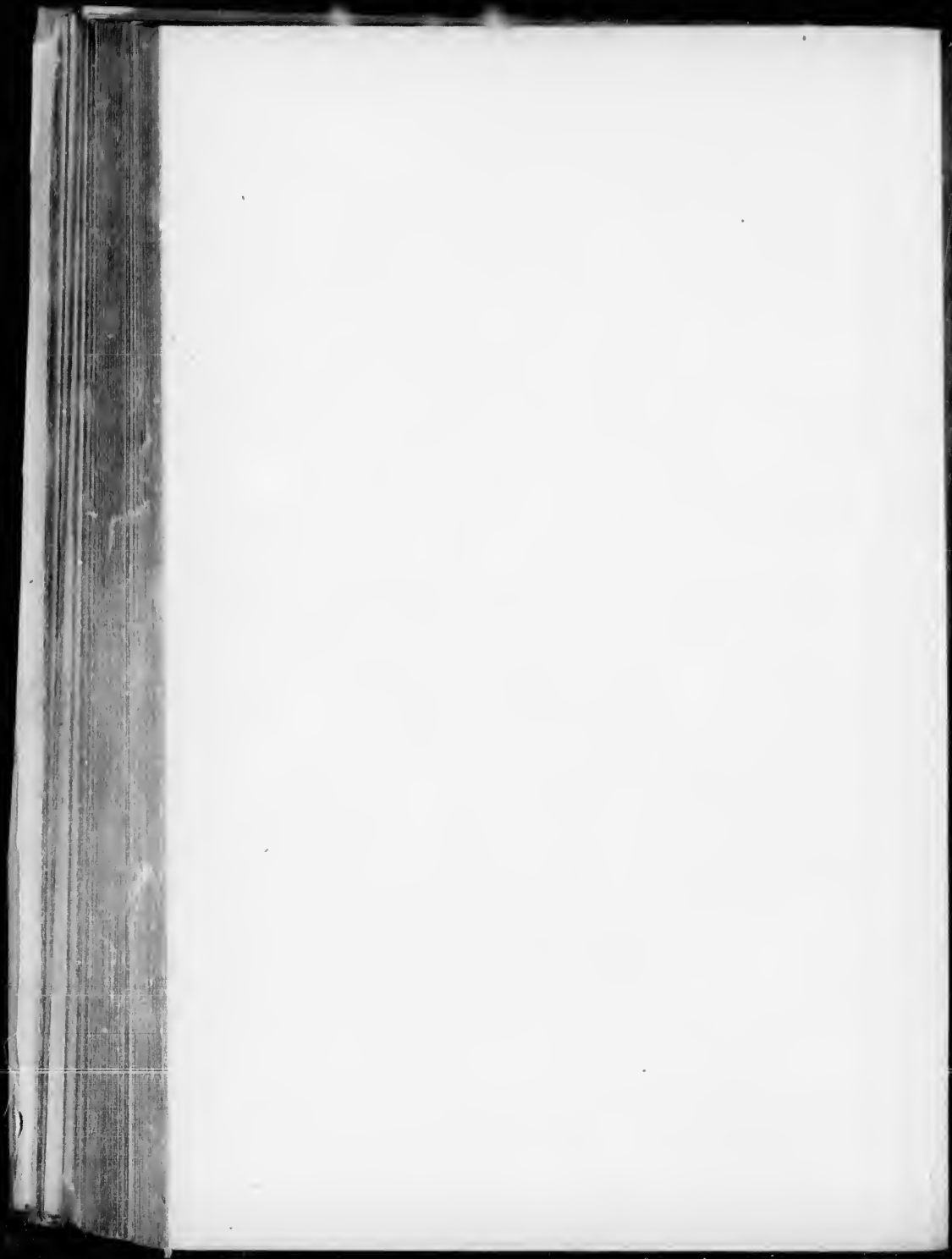
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They serve to clear away the mucus. Especially useful in atonic cases. Do not use in early cases with irritation until that inflammation is overcome. In most cases after a short treatment by alkalies patient will benefit by acids. Some even say it corrects acidity.

VI. ULCERATION OF THE STOMACH.

Two forms: 1, Hemorrhagic erosions; 2, perforated ulcer. Besides, there are in acute and chronic gastritis sometimes numerous small ulcers about the pyloric end, also met with in congestion from hepatic cause. Also follicular ulcers, also ulcers from irritant and corrosive poisons, also sloughing ulcers from debility and extreme cachexia. Ulcers are usually associated with gastric catarrh. Hemorrhagic erosion is more severe and more dangerous than simple catarrh. Pain is increased by food, and does not intermit between meals. The vomiting may be also at and between meals, may be streaked with bright blood. There is marked anorexia. A marked febrile reaction following the attack. It may last for years if the cause—alcoholism—be kept up. Hepatic congestion predisposes. Morbid appearance:—shallow excavations, sharply defined but not elevated margins. Ulcer is very small, under the size of a split pea. They are situated mostly along the lesser curvature, in other parts ecchymoses are seen, vessels are engorged with blood. The hemorrhagic erosions are seen after many other diseases, many are mere abrasions but others are deeper. Some may be simple P. M. solutions, occurring at points where the blood is just starting from the capillaries, or it may occur in just last few hours of life, due to disintegration of tissue from stasis of blood.

SIMPLE ULCER.—Chronic or perforated ulcer. This is an important variety, but such an ulcer may be an acute. It also may not be single, nor does it always perforate. Besides simple ulceration there are varying degrees of inflammatory reaction about. This ulceration is frequent, is found in 2 to 3 per cent. of all deaths. In this condition the ulcer is generally single. The ulcer is circular, oval or irregular, or kidney-shaped when two coalesce. Size varies from 10 cents to $\frac{1}{2}$ dollar, are sometimes 3 inches. Great extension is found only on the posterior aspect of the stomach. Commonest situation for the ulcer is towards the pyloric end, next towards the lesser curvature, next the posterior walls. These 3 include 85 per cent. of all cases. Edges are clean cut, punched out. If all coats be destroyed the mucous opening is largest, the peritoneal the smallest, so the ulcer is bevelled. The peritoneal opening is usually small, rounded and punched out after formation of the ulcer at first, and for a long time no alteration takes place around it; but when the ulcer is of long standing, its edges are hard and thick. Under these circumstances edges are rounded and elevated, and this induration may extend $\frac{1}{2}$ or 1 inch from the ulcer. This indicates chronic ulcer. The base of the ulcer is very often firm and hard, or is soft and flocculent, seems gelatinous, with sloughing tissue, but a hard base is commoner. These ulcers sometimes cicatrize, even 50 per cent. of the cases thus appear. New fibrous



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tissue forms, contracts, hence puckered cicatrix. If the ulcer is too large for the edges drawn together, then the cicatrix centrally will be of hard fibrous tissue. If an extensive ulcer, there may be even hour-glass contraction of the stomach. Hence perhaps stricture with dilatation of the cardiac end.

SYMPTOMS are sometimes latent; no symptoms until there may be violent hemoptysis, or nothing perhaps till perforation, collapse and death. Always bear in mind that dilatation may follow a latent gastric ulcer, so history may not help, and then the dilatation would not be malignant. But in the majority of cases there are overt symptoms, such as distressing pain in the stomach, which is constant, and one of the earliest symptoms. Is referred to a small area, generally near the xiphoid cartilage. Pain is most severe after meals, is of a weary, boring, burning kind, not usually lancinating. Usually it begins after about 15 minutes after taking food, and soon attains a maximum, but sometimes it is delayed longer. The pain abates as the stomach empties itself. In exceptional cases pain does not cease now but remains. Hot food causes most pain, movements increase it, also pressure. The continuance of the pain is variable, may last for weeks and then suddenly cease. This pain is usually accompanied by a corresponding pain in the back, between 9th and 11th ribs. Gastric ulcer causes little constitutional thirst, no disturbance, no fever. Appetite good, perhaps excessive. Different kind of pain also occurs, which is paroxysmal, and affects the large area, may be strong enough to cause syncope. Is relieved by emptying the stomach. Is supposed to indicate the tension of the ulcer. There are occasional eructations of some stuff, and vomiting, especially if the ulcer be near the pylorus. The time of vomiting varies, may be right after ingestion or not for hours. In a few cases it is very severe. It may have small streaks of blood, and very often the hemorrhage is abundant from the opening of vessels. This is frequently preceded for a day or two by an increase in pain (doubtful). Sometimes large artery is opened, as the coronary or splenic. If the blood is in only small quantities and escapes slowly, it may accumulate in the stomach and pass out by the pylorus without vomiting. If more severe there are signs of enfeeblement, diarrhoea ensues of black, tarry stools without fever, which indicates hemorrhage, but duodenal ulcer also has this symptom. But more frequently the hemorrhage causes vomiting following faintness, nausea, depression. Syncope may follow. When hemorrhage has once occurred it is apt to occur again, even after the lapse of months or years. Hæmatemesis even of large amount is very seldom fatal, but needs careful management. Hemorrhage is more apt to occur if the ulcer be in the posterior wall or lesser curvature.

PERFORATION is more frequent than hemorrhage as 13 is to 4, still it is not commonly only 1 in 8 cases or 12 per cent. If perforation happens, it is generally after a meal, from increased tension. Symptoms are agonizing pain of the epigastrium with general peritonitis and with death in 18 to 36 hours, but in some cases by peritoneal adhesions. The gastric contents do not get into the general cavity. Hence abscess with hectic symptoms and death from exhaustion, or abscess may point externally. You may find perforations made by post mortem

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examinations. There may be death from gastric ulcer without much hæmorrhage or perforation, but by exhaustion. This is especially the case when the ulcer is large, pain great, vomiting frequent, or bleeding small and frequent, or when extensive adhesions form with neighboring organs, and so disturbing their function. When a large ulcer is near the pylorus, especially if it has hard edge, the pyloric muscle is hindered, hence pyloric obstruction with gastric dilatation. Death may result from inflammation extending to other organs, as through the diaphragm, setting up empyema or affecting the lungs, liver, etc. Improvement is noted by the lessening of the pain. Duration of the disease is variable, has proved fatal in 10 days. In these rapid cases perforation is generally the cause. In the majority of cases, weeks, months, or years precede the fatal issue. One characteristic of the simple ulcer is its great chronicity and difficulty of healing. Ulcers of another nature in the stomach heal readily, so there must be a special cause acting in simple ulcer. Various theories are advanced to account for this—an inflammatory theory, a nervous theory of production of ulcer, a vascular theory for the disturbance of the vessels in the stomach, which is the accepted theory. According to this the initial cause is arrest of circulation in a part of the stomach, and sufficiently deep to allow the acid gastric juice to exert solvent action, hence the slough, but in all probability a previous hemorrhage was the cause of the arrest. Virchow says most frequent causes are: 1. Embolism, hence extravasations of the blood. 2. Obstruction through portal obstruction. 3. Contraction of the vessels as in chlorosis. 4. Violence as in vomiting. Excessive acidity of the gastric juice may have some effect in producing ulcer, if there be erosion to start with or little catarrhal ulcers.

PREDISPOSING CAUSES.—Sex—twice as frequent in women.

Age—met with at all ages, commonest between 14 to 30 in women and 50 to 60 in men. Chlorosis, anæmia, debility, etc., predispose, because vessels are not well nourished. Amenorrhœa, ague, dysmenorrhœa are often found with it, also phthisis and cardiac disease and syphilis. In early stages simple gastric ulcer can hardly be diagnosed from other gastric affections, but when gastric distress, epigastric circumscribed pain finally denote organic disease in the stomach; but in addition you have sudden hæmatemesis, which no doubt exists in gastric ulcer, provided there are no other causes of it, as purpura, scurvy, hepatic pulmonary or cardiac disease, provided also vicarious menstruation can be excluded. The only organic disease capable of producing the same symptoms as gastric ulcer is gastric cancer. Cancer may supervene on simple ulcer, but simple ulcer may proceed to perforation if nothing but dyspeptic symptoms, excessive acidity, etc.

DUODENAL ULCER.—Mode of development is similar to gastric ulcer. Duodenal ulcer is rare.

SYMPTOMS differ very little from gastric ulcer. It often runs a latent course, it may therefore give rise to only few dyspeptic symptoms. Pain is less complained of. Is often in the right hypochondrium with pressure symptoms, or



may be it is at xiphoid cartilage. Vomiting may be present, and is usually associated with stricture of the pylorus. Hemorrhage of the bowels or stomach occurs in one third of the cases.

TREATMENT OF GASTRIC ULCER.—Rest to the body and stomach, keep in bed if you can, give no solid or irritating food, hence exclude oatmeal, Graham flour, fruits, coarse vegetables. Milk diet, 2 drs. every hour are taken. If milk tends to coagulate, try lime water with it; if not enough milk can be taken to keep up the strength, give meat extracts. Prepare by digesting meat by acids, sol. of Pepsine at a fairly high temperature. Give equivalent of $\frac{1}{2}$ lb. meat per day. As symptoms improve you can add to the milk diet soft foods of various kinds. In a few weeks give more substantial broths, beaten egg, then fish, etc. A combination to substitute milk and lime water, take 6 dr. of powdered meat and $2\frac{1}{2}$ dr. Sod. Bicarb. It does not allow digestion by the stomach, but lets it pass out to the duodenum and gives the stomach a rest. In cases where nothing can be taken by the stomach, rectal feeding must be resorted to. The two methods may be combined. Use beef tea, pancreatic extracts, etc. The best way to give an enema is put patient on the left side with the hips raised introduce a soft rubber catheter into the sigmoid flexure and connect with a fountain syringe. Inject $\frac{1}{2}$ pint. A mild alkaline dose of Carlsbad Salt in lukewarm water may be given every morning to keep the bowels free. Give 1 dr. of the Carlsbad Salt in $\frac{1}{2}$ pint of water. Washing out the stomach is not as good as in ordinary gastric catarrh. Gastric ulcer is a curable disease, if seen early enough, and the patient amenable to treatment and the treatment good. Bismuth is good to relieve gastralgia sometimes. If pain is severe, Opium or Morphia may be used. Best given by the mouth. In other cases of paroxysmal pain, hot stupes or cold applications, or Belladonna plasters, or leeches may be used. For pyrosis Bismuth or Kino is good; for constipation, mineral waters, Rhubarb, Aloes, etc., or by enemata, of which Glycerine is the best. You can use for a long time without losing its effect. Chloral is recommended to prevent lactic acid fermentation to lessen excessive appetite and to act as a disinfectant, to promote healing in sleep. In certain old standing cases, if history points to syphilis, give Pot. Iod. for some time. In stenosis of the pylorus from cicatrization you get stricture with dilatation. Surgical operation may be done by gastrotomy and then dilating the pylorus. Stricture of the cardiac end of the œsophagus may similarly be treated.

LXVII. CARCINOMA VENTRICULI.

1 per cent. of all deaths is from disease of cancer of stomach—is one-third in frequency of cancer.

Forms.—Several: 1. Medullary or soft, principally found at pylorus, as rounded swellings. It produces numerous metastases. 2. Adenomatous or glandular. 3. Scirrhus occurring, is a diffuse thickening about pylorus, producing ste-

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nosis. 4. Colloid, may appear in very young persons, infiltrates peritoneum, liver, pancreas, etc. 5. Epithelioma, affects cardiac end and lower end of œsophagus. Cancer may run a latent course, but that is rare. Gives rise then to mild dyspeptic symptoms with increasing cachexia. In overt form the symptoms at first are not prominent. There is no pain or vomiting at first, but there is emaciation rapidly progressing, impaired digestion, etc., countenance becoming sallow, fever is absent and tongue clean. Sooner or later localizing symptoms come on. Pain may be fixed like gastric ulcer, or may be felt only after eating; or pain may be continuous, aggravated by eating. Vomiting due to stenosis. If cardia be stenosed, vomiting takes place at once; if pylorus, vomiting is sometimes hours after. Gastric symptoms then increase suddenly. Temperament gets irritable and morose. Is not feverish unless cancer is growing very rapidly. At late period hemorrhage occurs, is generally moderate in amount, giving black or coffee ground appearance to vomit. More rarely there may be copious hæmorrhages (hæmatemesis), may be pure blood, red or black, clotted, etc. About this time a tumor generally appears in epigastrium. As local symptoms increase, the cachexia augments, tongue red and glazed, and marked loss of appetite, increased debility, prostration, anasarca, delirium and death. As disease advances secondary cancer appears elsewhere. Medullary and scirrhus appear in liver, colloid in omentum and peritoneum, etc. After a time, average 12 months, patient dies worn out by vomiting, pain, loss of blood. Towards termination, anasarca, jaundice, hiccough, etc., may appear. Coma is a frequent antecedent. Death may be from hemorrhage or perforation. Septicæmia also may be a cause.

WHEN CARDIAC ORIFICE is seat of disease, entrance of food into stomach is impeded, hence symptoms like œsophageal cancer. Act of swallowing causes pain, even very severe, sense of uneasiness at epigastrium passing through to the back. Eructations of food, and as soon after eating pain is referred to lower end of sternum, even commoner there than in epigastrium. The growth being high up it is difficult to feel. The weight of tumor cannot drag stomach down, for organ is anchored above by diaphragmatic attachment. Stomach does not enlarge, but tends to contract, ditto intestines, hence retraction of abdomen. Diaphragm may now descend to compensate, hence downward displacement of liver, heart, etc.

WHEN PYLORUS is affected there is more or less stenosis. This gives dilatation of stomach. In cancer there are very foul fecal eructations. The pyloric tumor can generally be felt, unless abdomen be very tense or sensitive. It is situated generally a little to right of media line and 1 to 3 inches below margin or ribs. As it grows it gravitates down even as low as iliac region (rare). This tumor frequently pulsates from lying on aorta. It is generally somewhat movable, especially in females, hence posture or full stomach affects its position. But it may lose its movability and become attached to adjacent structures. When body of stomach is affected and neither end, symptoms are different, vomiting takes place soon after meals, and is moderate in amount. Physical signs

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are not available unless anterior wall be involved, when sometimes the distinct outline of stomach can be made out. Sometimes a resisting tumor of upper and lower border can be made out, but if of posterior wall it is well nigh impossible to make it out. Secondary cancerous nodules are present in nearly $\frac{1}{2}$ of cases, $\frac{3}{4}$ ths in Scirrhus, $\frac{1}{4}$ th in medullary, rarely in colloid. Secondary cancer is rapidly growing and generally is medullary, especially affecting the liver twice as often as in glands of portal fissure, 3 times as often as in lungs. Cancer of stomach produces obstruction, hence hypertrophy to overcome obstruction, hence dilatation. Contraction may occur from a scirrhus cancer of wall not affecting either orifice, arises from shrinkage, and also because vomiting keeps organ empty. Contraction is more common than dilatation.

ÆTIOLOGY.—Heredity, but in majority of cases you can get no such reason; other causes are

DIAGNOSIS OF CANCER OF STOMACH.—Gastrorrhœa (mucous flux) can be distinguished from that of gastric cancer by the latter having greater disturbance, the lanceolating pain, the rapid emaciation and cachexia. There is also an epigastric tumor in most cases. Ulcer of stomach—men have cancer oftener, women ulcer. Cancer over 30, ulcer common under. Site—cancer most frequent at pylorus, ulcer at posterior surface and lesser curvature. Appetite in cancer is early interfered with, if followed by early emaciation and cachexia. In ulcer in many cases appetite is too great, later he is afraid to eat, although feels like it. Pain in cancer is not an early symptom, and is less distinctly affected by food, is inclined to be constantly present; opposite in ulcer. Character of pain in ulcer is more severe in degree than in cancer. The pain in cancer is lanceolating, but may be dull burning like ulcer. Vomiting on an empty stomach is more frequent in cancer, and vomiting of less blood. Vomiting on empty stomach is rare in ulcer, and hemorrhage is often profuse. Tumor—in addition in cancer you generally (80 per cent.) find tumor. Tumor occurs very rarely in ulcer, but it indicates adhesion to adjacent parts, hence symptoms subside, tumor would then be immovable. Complexion, cachexia in cancer, failure of strength early, independently of pain, vomiting, hemorrhage. In ulcer failure of strength is late, is proportionate to the pain, vomiting and hemorrhage. Cachexia, late, is rarely found. Duration and progress.—Cancer fatal in 6 to 24 months, progresses steadily to fatal end. Ulcer may last many months or years without great loss of strength. Exacerbations and intermissions often occur. Enlargement of liver suggests cancer. Edema of leg or arm from thrombosis is suggestive of visceral cancer. Never seen in ulcer. Dilatation of stomach—in cancer HCL is absent. If from other causes hcc HCL is only temporarily absent. Its habitual presence is against cancer. Perforation of the stomach is rarer in cancer than ulcer. Enlarged glands in groins, axilla, etc., favor cancer. Hemoglobin of blood is more reduced in cancerous dilatation than in that from other causes. Pernicious anemia sometimes resembles cancer. Abdominal aneurism. You have a pulsating tumor as sometimes in pyloric cancer, but functions of stomach are not as

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impaired; the pain is dull, boring, etc., felt chiefly in the back. Often neuralgic pains along affected nerves. Pain not aggravated by food. Pulsation occurs in all positions contrary to cancer. Cancer of retro-peritoneal glands, pancreas, left lobe of liver also occur. Of pancreas, stomach is not affected.

TREATMENT can only be palliative. Diet should be light, easily digested, and nutritious; meals small and frequent,—milk, beef tea, oysters, etc. In advanced stages of pyloric obstruction use food which will easily pass and digest in bowel, as sago, arrowroot, egg beaten with sugar, pulp of meat, etc. Later nutritious enemata may have to be resorted to—pepsin. Acidity of stomach may be neutralized by Soda, Potash, Magnesia, and the fermentation needs correcting for this use charcoal in milk. Charcoal must be finely powdered. Chloral Hyd. lessens fermentation, so does *Ac. Carb. gtt. 1*, Glycerine, etc. Fætid eructations call for other drugs, especially Creosote, give in pill, or as *Creosotum*. Bi or Hyposulphide of Soda. To relieve pain, Codeia, Chloral Hyd. Conium better than Opium; do not stop secretions, but sooner or later you will need Opium. If begun, Opium habit is soon to be formed, but cannot be helped. Doses will need increase.

LXVIII. CIRRHOSIS OF STOMACH

Is very rare; resembles cancer. There is hyperplasia of connective tissue, hence another name, fibroid thickening. Others call it hypertrophy of walls of stomach. Simple fibroid thickening of pylorus leading to stenosis is often confounded with above. Cirrhosis is considered analogous to cirrhosis of liver, occurs about age of 40, chiefly in men and in the intemperate, chiefly with marks of adhesive inflammation to adjacent organs. It renders walls of stomach thick generally; but if stenosis results, the consequent dilatation leads to thinning of wall. Ordinarily the thickened wall is yellowish, elastic, tough, and resembles scirrhus to naked eye, but under microscope does not shew the scirrhus cellular growth; it is a fibrous overgrowth. In some cases the stomach does not collapse, wall is so thick. The cirrhosis tends to affect the pyloric end, tending to stenosis, but often it affects whole wall. Symptoms are much like cancer, yet it is of slower progress, 10 to 15 years. Hemorrhage is very rare in cirrhosis. Habits—spirit-drinking history. Absence of tumor when pylorus is above affected, but if whole wall is infiltrated a tumor sometimes can be made out. Cachexia is not so marked. Absence of secondary deposits. Indistinctness of local tenderness of pain. Symptoms are like a chronic dyspepsia, yet often the symptoms are rapidly developed, and you get a clinical history of progressive pernicious anemia. In other cases the symptoms are latent, especially when area involved is small.

TREATMENT—Nil, it progresses steadily to fatal issue. Treatment is merely symptomatic.

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LXIX. ATROPHY OF STOMACH

May appear independently of other disease. Symptoms are gradual loss of strength and appetite chiefly for animal food, flatulence, etc., anemia, etc. Still patient may remain fat. Nausea and even vomiting may exist. Profound weakness gradually creeps on, pulse weak, thready, etc., constipation, delirium, coma, death in 12 months. No excess of white cells in blood. So case resembles advancing pernicious anemia. No cause can be assigned—some say physical. Men have it oftenest. There is atrophy of gland structure of stomach. A similar gastric atrophy occurs in some cases of cancer, as of breast, etc., accounting for many cases of rapid failure of strength. Instead of general there may be a peritoneal form of atrophy affecting generally pyloric end, complicated with congestions. Causes are chronic gastritis, hepatic, cardiac, renal disease. Hence treatment must be according to cause.

TREATMENT.—Rectal enemata, digested foods, etc.

FUNCTIONAL DISORDERS OF STOMACH included under term dyspepsia.

LXX. ATONIC DYSPEPSIA.

CAUSES.—1. Anything depressing vital powers through nerves, blood, etc., hence excessive or long continued mental or emotional excitement, loss of sleep, venereal excesses, loss of exercise or altered quantity, hence symptoms of chlorosis, etc., loss of exercise, variable weather, general asthenia, lithemia and gout. 2. Causes immediately affecting stomach, as prolonged fasting, excess of fluids, condiments, constipation. 3. Other causes,—active mental or bodily exercise after meals, febrile affections, act by lessening secretion. 4. Inherited predisposition where motor power impaired. 5. Old age, from degeneration of glands. Inflammation and other diseases of the stomach, as gastritis, etc., may also act. Ulcer. Cancer.

SYMPTOMS.—1. Impairment of digestive power for proteids, starches, fats, especially of proteids. 2. Uneasiness and heaviness in pit of stomach, leading to palpitation, dyspnoea, tightness. 3. Several hours after eating, flatulence, eructations of rancid materials. May affect stomach or bowels. There is little or no thirst, appetite is impaired. Tongue is large, pale, indented, sometimes indistinctly furred. Disturbances about throat, enlarged tonsils, etc., hence hoarseness, hawking and spitting. Constipation commonly exists, distends bowel by gases, hence pain; distention, especially at flexures of colon. Evacuations are chiefly hard. Urine pale, clear, low density. Skin moist, cool. Pulse weak and slow if at rest, but is easily affected, hence palpitation, dyspnoea, etc. They suffer from lassitude, and especially after meals irresistible drowsiness. Intellectual powers perhaps lessened, timidity. Complexion pallid or sallow after a time. Extremities cold. A chronic gastritis may be induced. In functional dyspepsia ordinarily no alteration can be discovered, but sometimes there is



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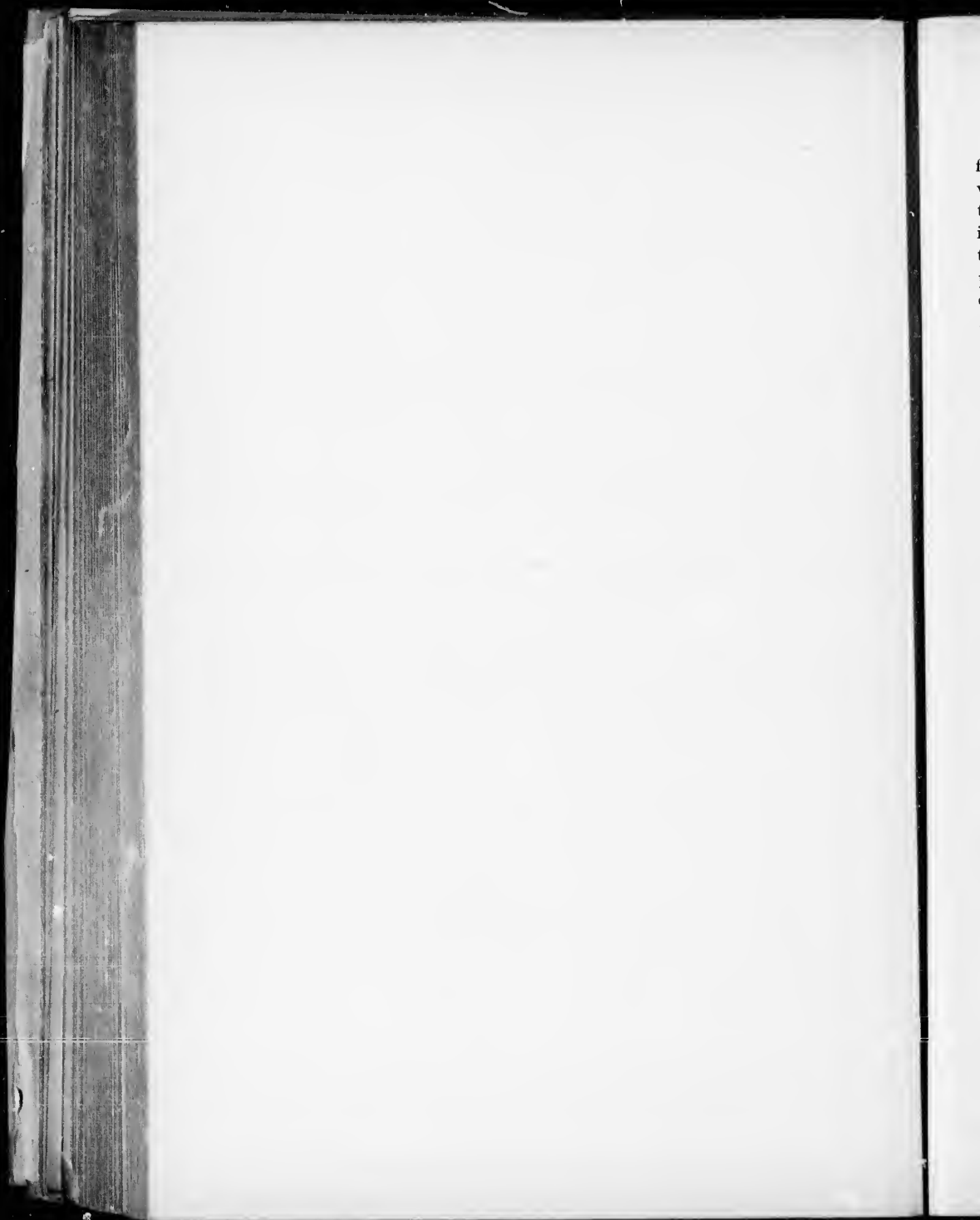
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fatty degeneration of gastric tubules, sometimes combined with atrophy of wall. A fibro nucleated tissue may replace the gland tissue. Tendency to degeneration increases with advancing years, and may occur entirely independently of inflammation, yet in other cases is caused by inflammation. Causes of these degenerations are not known, yet alcoholism may, or impairment of semilunar ganglia may lead to this fatty degeneration. This fatty degeneration is often found in phthisis struma, fatty liver, etc., giving no symptoms. So long as stomach can do its work you may get no symptoms, especially since intestines can supplement the work of stomach. Water poured out by impaired mucous membrane to some extent compensates for lack of gastric juice. In inflammation or febrile states the epithelium of glands undergoes granular degeneration, hence impairment of function.

CAUSES of deficiency in gastric juice: 1. Organic conditions, gastritis, catarrh and general granular degeneration of stomach, malignant disease. 2. Hereditary predisposition to non-formation of gastric juice, weak stomach; these are thin, delicate persons all their lives. 3. All forms of mental or emotional excitement, if excessive, cause arrest of secretion. 4. Excessive bodily fatigue and the febrile state, these lessen secretion and suspend feeling of hunger. 5. Gluttony, alcoholism, etc., act by wearing out excitability of gastric nerves. 6. Indolent and sedentary habits, eating too much habitually. Enough juice is secreted to digest sufficient, but not too much. 7. Deficient innervation as by injury to vagus, also defective action of excretory organs. Symptoms of deficiency of gastric juice.—Food is arrested in stomach, consequent distress after eating, especially of albuminoids. Decay of albuminoids in alimentary canal, hence evolution of foetid gases. Fermentations,—alcoholic with gas, lactic acid without gas, butyric acid with H and CO₂ in stomach. When there is plenty of gastric juice, food leaves stomach in 2 to 3 hours; but if deficiency, may remain 24 hours. Half hour after eating sense of weight and uneasiness is felt in abdomen, remaining till food leaves stomach. If any portion of food remains solid there is feeling of cramps in epigastrium, due to these chunks getting into pyloric orifice. If food remains undigested some hours it irritates mucous membrane of stomach, and gives reflexes, as headache, slightly furred tongue, throbbing of temples, palpitation, pulsation of aorta, disturbed sleep, etc. Sallowiness of complexion is frequent. If digestion be poor for some time, the body suffers, spirits depressed, cold extremities, mental depression, even hypochondriasis.

TREATMENT ATONIC DYSPEPSIA.—Measures to establish gastric secretion, improve blood, etc. Diet is very important. Food must be easily assimilable, given in small quantities, at shorter intervals. In addition some need a light supper at 9 p. m., as beef tea, oatmeal, gruel and milk, or biscuit and milk or arrowroot. If they sit up late they feel sinking sensation, so need nourishment. Bodily fatigue and nervous exhaustion must be avoided, especially while digestion is going on. Mastication must be good. In bad cases rest both before and after meals is advised; actual rest in bed in very bad cases may be needed for 2 to 3



days. Exercise—mental and bodily—is useful, but only when digestion is not in progress. Exercise short of exhaustion has very great power to influence digestion. Sustain function of skin by tepid baths and friction. Foods to avoid,—fresh bread, rich pastry, most sweetmeats, tough and salt meats, cheese, some vegetables. There is sometimes not enough gastric juice to digest the albuminoid capsule of starch granules, hence need to rupture capsule. Bake without ferment your starches, flours, etc., slowly to hardness, and then soften in water. Bread must be stale. Sea biscuits are good. Potatoes are best vegetable; beets, asparagus, rice are good. Amount of vegetables must be small. Starchy food may agree if taken alone, not so if taken in a mixed meal. Starch and fat together are especially apt to disagree, as nuts, corn, etc. Rancid fat is bad. If emaciation be great, fats must be fed; still in weak digestion do not give fat meat, do not fry, for oil then envelopes fibre of meat and prevents digestion. White flesh and fish (fresh water) are best, contain less fats than red meat or sea fish. Oysters are well digested. Deficiency of gastric juice is helped by drinking water. Take a small glass of water 1 to 2 hours after meals, is better than cup of tea or coffee after dinner. If person has eaten too much, cup of coffee or wine is good. Do not drink tea with meat meal. Auxiliary foods to promote digestion—small quantity of tea or coffee, wine, etc. Alcohol tends to retard digestion and lesser secretion. Ale, porter and effervescing wines are very unsuitable, for they contain a ferment.

MEDICINAL TREATMENT.—Dinner pills, Ipecac in some form enters into about all of them. Budds. Ipec. Pulv. gr. $\frac{1}{2}$ to 2, Pulv. Rhei. gr. 3, Capsicine gr. 1 Pulv. Take before dinner. Salt and mustard are used for same purpose, taken before meals stimulates digestion. Mineral acids,—HCL or HNO₃, taken $\frac{1}{2}$ to $\frac{3}{4}$ hour before meals, given in small doses of Ac. Dil. in. 5 to 15 well diluted. They form an artificial solvent to food, but have also a general tonic influence on stomach and system. Are especially useful if lactic acid fermentation is occurring. They neutralize the alkaline saliva, hence give scanty gastric juice chance to work. Alkalies are given after food, to prevent acid fermentation, relieve heartburn; do not continue long, as they tend to harm. Pepsine, etc., are much used gr. 15. Do not overdo use of Pepsine, etc. HCL Dil. may be given with small doses of Morphia or Strychnine. Nux Vomica or Strychnine in cases where mental labor is cause is good, it also may be of use in flatulence by toning muscle coat. If patient be decidedly anæmic, Iron or Arsenic is needed, yet needs care, for may not agree with stomach, so use milder preparations, as Fer. Redact., Cit. Am. Fer., etc. In deficient secretion of gastric juice as after fevers, etc., Quinine is the best. Give gr. 1 to 2 in pill or sol. before meals, or give some form of Cinchona. The other bitters are useful when appetite is lost, as Quassia, Gentian, etc., while aromatic bitters promote gastric flow, as Calumba, Cascarilla, etc. Combine bitters with HCL. Stop if they fail to benefit in a few days or cause irritation. Salicin. gr. 5 to 10 after meals.

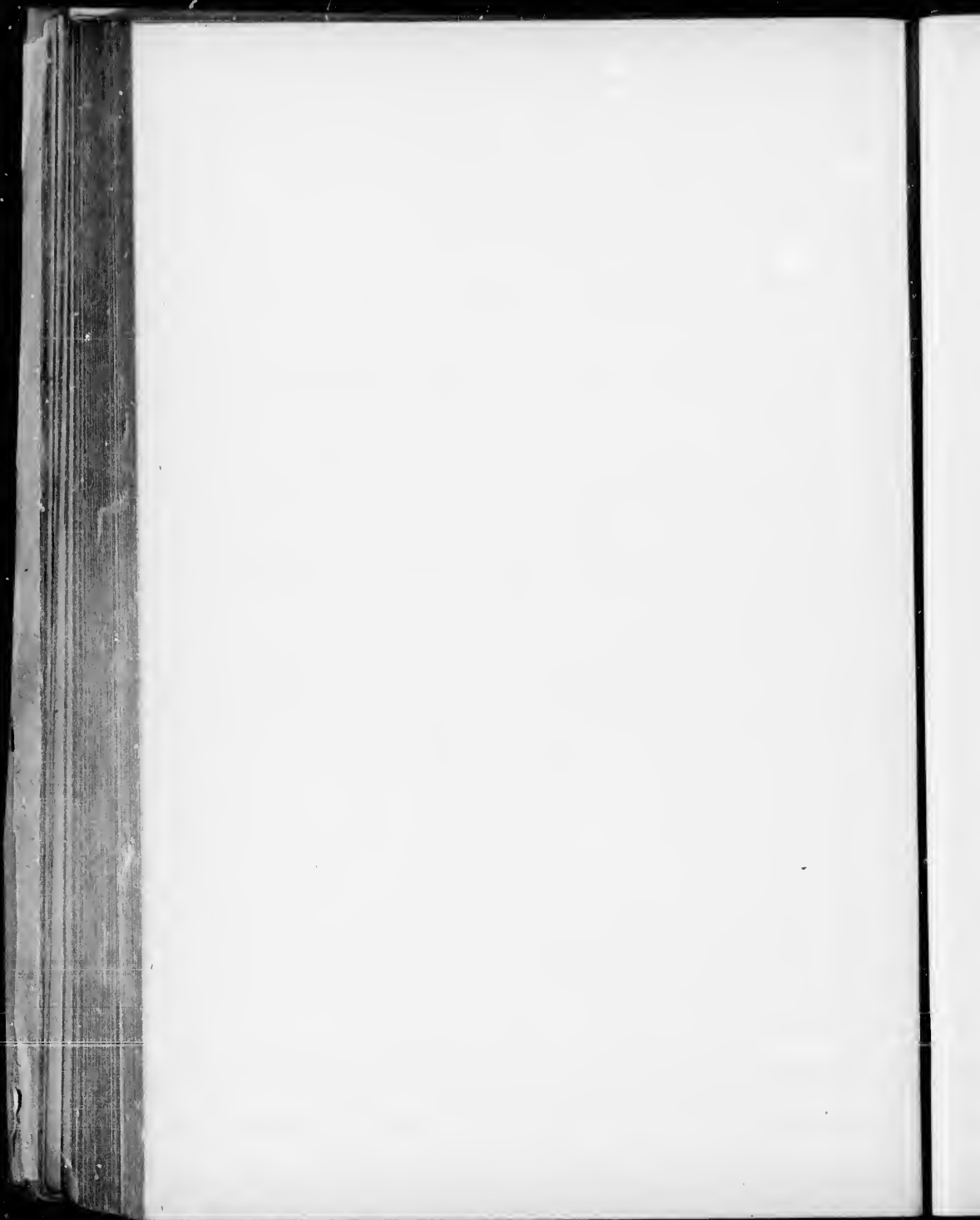


RELIEVE CONSTIPATION.—Do not give irritating drugs, give Ext. Aloes or Rhubarb. For acidity or flatulence give Magnesia and Rhubarb, or Charcoal, or Spts. Arom. Am., or Aqua Menth. Pip.—changes of treatment are in order. Putrefaction of food occurs when there is lessened gastric juice, when there is pyloric obstruction or deficient peristalsis, etc. Alcoholic fermentation is favored by acid in stomach, etc. Kind of fermentation depends greatly on kind of food and ferments taken in. Thus yeast cells are often taken with bread or beer. Putrefactive fermentation—albuminoid food becomes putrid, H_2S evolved, eructations of such, heaviness in stomach, mental depression, furred tongue, evacuations dark and offensive. This kind is common result of over-eating or of pyloric cancer. Best treatment after over-eating is emetic and a saline purge. Charcoal is also good, also Creosote as disinfectant. Alcoholic fermentation—is more commonly result of poor digestion, follows use of new bread, vegetables, fruits, new wine, poorly fermented beer. Alcohol CO_2 , acetic acid are produced and *sarcina ventriculi* are found. There is great flatulence, relieved momentarily by eructations of gas, perhaps vomiting of sour smelling frothy stuff. Palpitation of heart, colic, diarrhoea are common; if this fermentation be habitual you get constitutional symptoms, less spirits and energy. This indigestion though may be produced by faulty state of general health brought about by overwork or worry. Articles tending to this fermentation must be avoided, as succulent vegetables, new bread, bad beer or new wine. Change of air, exercise are good. For eructations the pill of Ipecac, Capsicin, etc., is good. Sulphite of Sod. gr. 15 to 30 T.I.D. Large doses of common salt will check this fermentation. Dose of HCL Dil. m. 10, $\frac{1}{2}$ hour before meals, and Gent. or Calumb is very useful to overcome flatulence from fermentation. There may be pain in connection with flatulence, for this give Spts. Chloroform or Spts. Ether Co., etc.

LXXI. GASTRIC FERMENTATION.

LACTIC ACID FERMENTATION is more common than alcoholic. Carbohydrates changed to Lactic Acid. There is no flatulence; heartburn, cardialgia, pain in pit of stomach, etc., are characteristic. May be vomiting, sour taste in mouth. In infants this fermentation may produce alarming colic. Vomited matters are very acid. Infants pass epagulated milk. Lactic Acid fermentation occurs in weak, delicate persons; everything they eat turns sour.

BUTYRIC ACID FERMENTATION occasionally forms from Lactic Acid; being volatile gives eructations pungent, rancid, sour, also causes heartburn. Treat Lactic Acid and Butyric Acid fermentations by avoiding starches, cheese, fat, sugar. Relieve acidity temporarily by alkalies, as Sod. Carb., Pot. Carb. (even small doses of Nitric Acid min. 5 to 6 T. I. D. 4 hours after meals). Soda acts more on liver, increases bile. Pot. on kidneys, Amm. on skin. If tongue is definitely furred, Soda is best. Astringents, as Bismuth, before meals with Opium, or HCN if necessary, are good. Giving of mineral acids especially H_2SO_4 . Alcohol is sometimes useful, checks lactic and butyric fermentations.



Pot. Iodid, will increase for a short time the flow of saliva, may be given if there is deficient saliva. Food is to be taken slowly, well masticated. Defective action of excretory organs may cause functional dyspepsia, as of liver. In this there is sallowness of skin, coated tongue, impaired appetite, nausea, constipation, impaired sleep, *i. e.*, a bilious attack, or it may be more severe, an acute gastritis. To treat, counteract indolent habits by exercise. Food must be plain; if attack sets in, secure starvation for 2 days, and drink only water, and give medicines to act on liver, as Blue Pill, Eucalymin, etc., at night, followed in a. m. by salines; may be functional or organic. Characterized by paroxysmal pains in stomach often called spasms. These come on when stomach is empty. While pain lasts epigastrium is tender to touch, pulse is slower, surface cool. This pain is relieved when food is taken or patient lies down. Vomiting is rare, may be in severe cases; perhaps pyrosis, especially on movements. Often dyspeptic symptoms may be entirely absent, tongue is clean, appetite is good in intervals of pain, and digestion good unless ailment is very severe. Gastralgia occurs in both sexes between 35 to 50, never in childhood. In men common cause is worry of business, in women profuse menstruation is common cause. Occurs in convalescence from fevers, etc. Diagnose from organic disease by food relieving, ditto lying down. Treatment by HCN and Opium, HCN dil. gtt. 3 in mucilage is best. Belladonna, Chlorodyne, Chloroform are also used. Iron preparations are also useful if anæmia exists, give mild preparations. Alkalies in some cases are suitable alone; if debility, give mineral acids or biters. Diet light, meals regular, sleep sufficient, worry stopped.

LXXII. GASTRIC CONGESTION

Leading to hæmorrhage, hence hæmatemesis. Mucous membranes if congested often allow flow of blood, serous membranes only serum. Gastric congestion is merely a symptom, may be from mechanical obstruction to flow of blood through heart, lungs, liver. In death by hanging, convulsions severe, there is severe gastric congestion, ditto in epilepsy, with hæmorrhages. Cirrhosis of liver causes portal obstruction, and hence gastric congestion. A molecular rupture of vessels—no visible rupture leads to effusion. Often in slight bleeding blood escapes notice, for is not vomited, yet hæmatemesis may be so profuse as to be fatal, rare. Cardiac and pulmonary diseases act to cause obstructive congestion. Mucous membrane is dull red from capillary congestion. Small erosions may exist. 2. Congestion from altered condition of blood. So poisonous circulating in blood may act, hence congestions in certain organs especially of stomach's mucous membrane. If gastric congestion be rapid there is more tendency to hæmorrhage. Habitual congestion tends to impair mucous membrane, lessens gastric juice and tends to hinder digestion. Hæmorrhage varies, greatest from ulcer, etc., opening vessel. Yet even mere congestion without rupture may lead to excessive flow. Symptoms of hæmatemesis, sense of uneasiness, weight, tenderness at epigastrium, with symptoms of syncope. This arrests flow.



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LXIII. DYSENTERY.

An inflammatory affection of colon. Two varieties, —specific and non-specific. Specific form, due to micro-organism, present in evacuations, thence into water, and so it spreads. Dysentery may be primary or secondary, as after typhoid, septicæmia, and many such. This secondary form may not be specific, a mere inflammatory colitis. There is no difference in symptoms of specific and non-specific forms, and morbid lesions are the same; catarrhal or erosive. Dysentery may be acute or chronic.

ACUTE DYSENTERY.—Symptoms—premonitory symptoms may precede, as out of sorts, lassitude; bowels may be constipated or not. Onset is commonly by distinct sensation of coldness in loins, even a chill or rigor, and feculent stools follow. Soon tenesmus is felt, characteristic—feels as though rectum is not emptied, and there is a desire to empty it. There may be pain in abdomen, colic; there may be fever with furred tongue, seldom high fever, mental activity is preserved. Fever, if severe, generally follows local lesions. After a few days patient looks haggard, skin clammy, pulse weak, soft, strength fails, and abdomen collapses, and can bear pressure. Pain is paroxysmal, severe, stools feculent, sometimes bloody, often scybala; character of stools differ with site of disease. If sigmoid or rectum be affected (commonest form) stools are very scanty, chiefly composed of mucus and blood, hardly a trace of feces, and tenesmus is very severe. In this form the bladder generally sympathizes, hence frequent scanty micturitions. In children there is apt to be prolapsus of anus. If œcœm of transverse colon be affected, stools are more copious, feculent, mixed with slimy mucus and sometimes blood, often called dysenteric diarrhœa. The tenesmus is not so severe as first form, nor is bladder so influenced. Cause of absence of feces in dysentery is spasmodic contraction of colon, holding feces in pouches, hence scybala. If disease continues, strength rapidly fails, hence exhaustion, eyes sunken, extremities cold, pulse rapid and weak, tongue dry, evacuations thinner, perhaps greenish from blood, or look like beef washings, and finally stools are serous, brownish, copious and very fetid, pain ceases, there is hiccough, rapid sinking and death. Malignant dysentery (Typhoid D.) (Epidemic D.) is met chiefly in camps or barracks. Typhoid symptoms added to dysentery—Temperature is low, skin dry, pulse feeble, not much accelerated, prostration extreme, vomiting, thirst, not much abdominal pain, rather heat, stools few, nothing peculiar to this form, are generally serous, odor fetid, tenesmus may be absent, scorbutic symptoms may appear, epistaxis, bleeding gums, etc.

SIMPLE CATARRHAL DYSENTERY.—Milder forms usually end in a week. Severe forms may take 2 to 3 weeks for recovery. Recovery complete. Specific form usually takes 3 to 4 weeks, but may become chronic, and last for months or years.

COMPLICATIONS.—Ulcer of liver, tropics, rheumatic state of joints, paraplegia, especially of lower extremities, peritonitis, pyæmia, scorbutic symptoms.

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CAUSES.—1. Sudden chill when hot, especially if after prolonged exhaustion. 2. Improper food, deficient amount, lowers function of intestines, bad quality. Salt food for a long time. Decomposing albuminous food acts irritatingly, and frequent cause in infants. 3. Fæcal accumulations in cæcum and colon cause irritation. 4. Impure air, effluvia of decomposing animal matters, sewers, etc. 5. Impure water. 6. Malaria may cause bilious dysentery, but perhaps it is rather impure water in malarial districts. The specific form is due to a specific germ. Occurs principally in the tropics, occurring even epidemically under certain favorable circumstances. The virus escapes by stools. Stools dry, and so virus gets into air, hence infection by air as well as by drinking water. Dysentery attacks both sexes, all ages. The intemperate and sickly are especially liable.

MORBID ANATOMY.—Two forms, catarrhal and membranous. Virchow says catarrhal always precedes membranous state. Sporadic cases are catarrhal. Epidemic cases are membranous. Catarrhal—1st stage, mucous membrane congested, slightly swollen, covered by transparent mucus, then it gets paler, more tumid, rings of congestion around the follicles which stand out. Submucous and muscular coats are also swollen by infiltration. Pus cells may be seen in between the glands and in submucous coat. Recovery may be perfect, pus cells absorbed. 2nd stage is ulceration or purulent softening, follicles necrose, mucous membrane over follicles and under slough, and follicles drop out. The muscular coat at this stage is infiltrated with purulent matter. Exudation now begins to be diphtheritic. Diphtheritic dysentery is usually found post mortem with the catarrhal. A fresh attack of hyperæmia takes place in catarrhal form, a fibrinous exudation with extravasation of blood thickens the mucous membrane, of a reddish white color. After a time patches of mucous, submucous and even muscular coats become gangrenous, from size of 5 cents up. In other coats abscesses form from the ulcers, forming sinuses, even lead to perforation. Recovery may occur by cicatrization. This is usually in rectum, and if it involves the whole colon, it usually spreads from rectum. In severe dysentery the whole colon is dark with congestion, even the lower part of ileum feels thicker than normal. In chronic cases there are brownish pigmentary patches, punched out ulcers, cicatrices, etc. In complicated forms the small intestines may be affected. Peyer's Patches involved. Dysentery lays foundation for most cases of liver disease in hot climates, hepatic abscess, etc. Spleen and pancreas may be enlarged, even abscess in spleen. Lungs may suffer, vesicular bronchitis, lobular pneumonia, pyæmic abscesses. There may be purulent effusions into cavities. For this subject in full see folio 171.

LXXIV. MUCO ENTERITIS.

Intestinal catarrh—an inflammation of small intestines, which occasionally extends to colon or duodenum. If it involves serous coat, hence peritonitis, it is called sero-enteritis. May be mild or severe.

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MILD FORM.—Symptoms: feels dull, griping, abdominal pains, most frequently in right iliac fossa extending towards umbilicus, attended by flatulence. This last does not last long, and then diarrhoea supervenes, but this may have existed from outset. The stools are offensive, of various colors. Abdomen is tender on deep pressure, either general or localized. Griping aggravated by flatus at intervals. Fever mild, pulse slightly accelerated. Some thirst, may be slight nausea. Tongue moist, white fur in centre, red edges, drowsiness, flushing of cheeks. Morning remission of temperature, evening rise. After few days symptoms subside and attack is over. This affection is one of commonest among children.

IN SEVERE FORM similar symptoms more pronounced, chilliness, etc. Local symptoms severer, as tenderness, diarrhoea, etc. Abdomen gets full, even tympanitic later. Stools fetid, even streaked with blood. Pulse small, frequent, compressible in diarrhoea, never firm and hard as in acute peritonitis. Tongue is apt to be red and raw, even shiny with papillae enlarged. Patient gets prostrate, faint, drowsy. After a few days symptoms may subside, and patient gradually get stronger. Urine deposits excess of lithates, appetite returns, etc. This in favorable cases. In other cases it passes from bad to worse, ending perhaps in death. The griping pain, tenderness, diarrhoea increase, becoming constant. Vomiting sets in, and you cannot nourish patient, so emaciation is rapid, pulse thread like, stools involuntary. In children convulsions, collapse, coma, death. If serous coat is involved it is sero-enteritis, and you get symptoms added gradually or suddenly of peritonitis. Constipation generally replaces the diarrhoea. In some cases you get jaundice from congesto extending to common bile duct, as from duodenitis. If lower part of ileum be inflamed, tongue is angry red, etc. If mucous membrane be inflamed it is reddened; if only follicles, the reddening is punctiform, there is intumescence, friability, etc., of mucous membrane. Secretion at first is sero-mucoid, later it gets tenacious, muco-purulent.

CAUSES.—1, Cold and damp, especially of feet or overheated body; 2, irritating substances, food, medicines, worms; 3, obstruction from invagination strangulation, fecal obstruction; 4, often attend fevers, pneumonia; 5, often accompanies severe burn; 6, suppression of menses, etc. Enteritis is more frequent in infants and delicate people, especially apt to occur during dentition, after measles and scarlatina.

DIAGNOSIS.—From peritonitis especially, also from typhoid fever—often mistaken. Also from colic and dysentery. Neuralgia—rheumatic affections of abdominal muscles. Acute hydrocephalus in infants. If muco enteritis be attended by vomiting and constipation, coma, stupor, etc., it resembles hydrocephalus, but in inflammation in brain you have pain in head and not in abdomen, and sequence of excitement as photophobia excitement, etc., then stage of depression and stage of coma. In muco enteritis pain is in bowels, etc., and symptoms of cerebral disorder later in case. Again, in cerebral cases vomiting is not attended by retching, nausea, or salivation, and keeps on when stomach

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is empty. In enteritis there is nausea, salivation, etc., and relief often by emptying stomach. It is well in all these cases to examine well for hernia, to bear in mind poisons might be cause. Lead poisoning may be mistaken for enteritis.

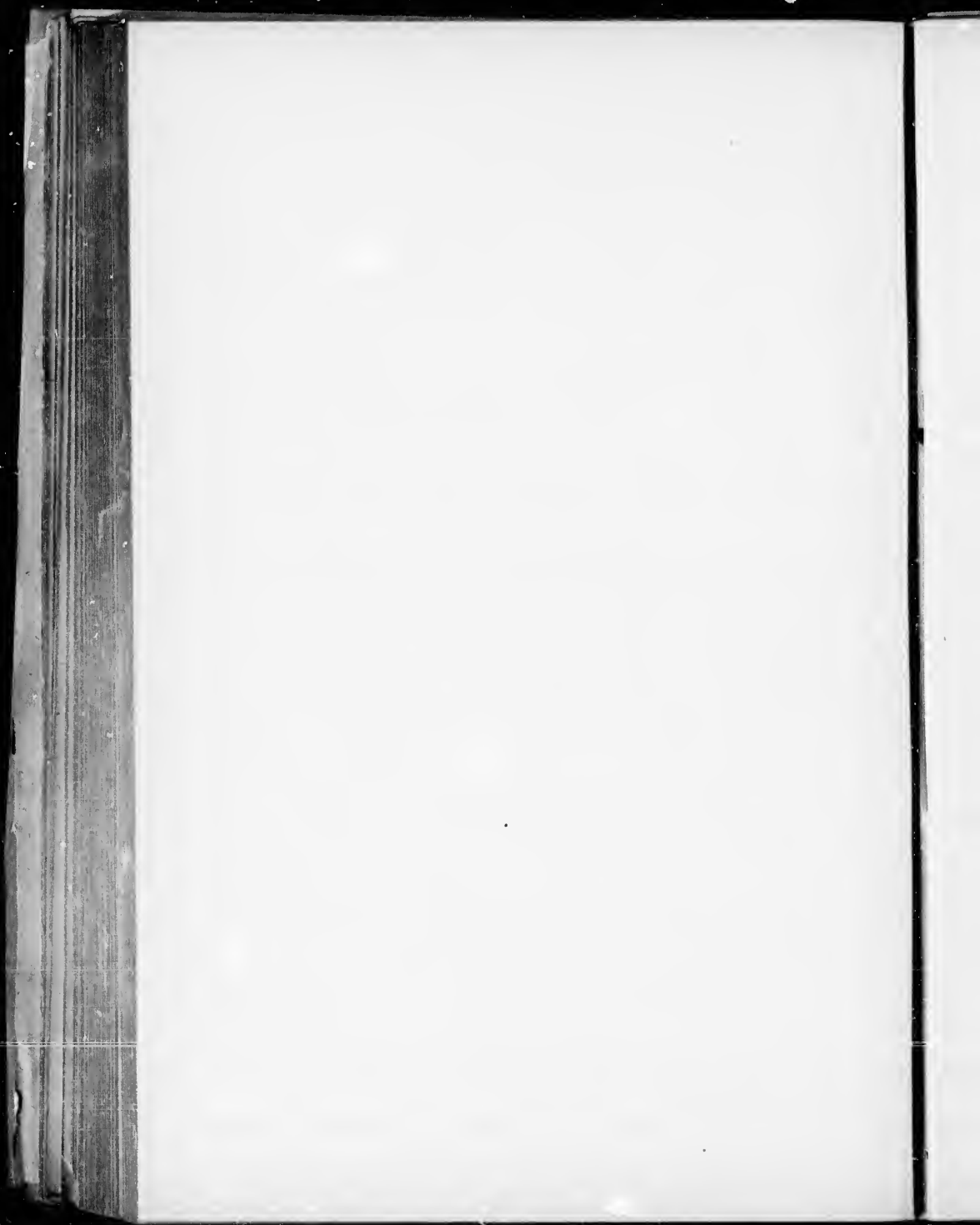
TREATMENT.—If constipation exist or irritating substances be in bowels, give mild cathartics as Castor Oil or enemata. Add Laudanum. If vomiting or bilious symptoms, give Calomel and follow by Sal Rochelle. If breath smell sour, give Magnesia. Some advise laxatives all through to keep bowels open. Use only mildest laxatives. But if there be marked inflammation of muscular coat of bowel, as noted by constipation, also if evidence of peritonitis, purgatives will not act till inflammation goes down. Hence avoid purgatives and give mild enemata. If much tenderness, apply leeches to abdomen, and give small doses of Calomel and Opium. Mercury is useful if stools are pale and urine turbid, especially useful in children. In mild cases Mercury is not needed. Alkalies are useful, are sedatives to mucous membrane and neutralize irritating products. Sod. Bicarb.—you may add Hyoseyamus, etc. If diarrhoea exist do not try to lock up bowels at once. Begin with mild measures, as Mist Cretæ, or if this fails a few small doses of Pulv. Ipecac Co. or Laudanum or Tr. Camph. Co. Starch and gruel, or barley water by enemata 1 to 2 oz. and a few drops of Laudanum is soothing. As disease gets chronic give small doses of mineral acids and Opium, or use vegetable astringents, as Catechu, Tannic Acid, etc. If serous coat be involved, treat peritonitis; absolute rest is necessary in all cases.

DUODENITIS.—Treat similarly, alkaline salts are principally used, as Pot. Tart., etc., no Mercury. Treat the emesis by ice. Feed soda water and milk in small quantities, etc.

LXXV. LEAD COLIC.

Colica Pictorum, Saturnine Colic, Devonshire Colic.—Occurs chiefly in painters and workers in lead, etc., as plumbers, glaziers and workers, type setters, etc. Cases here are not numerous. Shot works, workers in white lead, etc. Food (acid) from newly glazed vessels, cosmetics.

SYMPTOMS.—Colic often preceded by disturbance in health, loss of appetite, languor, low spirits, odd pains in abdomen. Symptoms augment, sometimes there are no premonitory symptoms. Pain, twisting in umbilical region, abdomen is retracted and hard. Rarely is it tympanitic. Pain on pressure on abdomen. Produces restlessness, symptoms of a colic. Remission occurs after some hours, leaving feeling of constriction, apt to be nocturnal exacerbation. Obstinate constipation resisting even powerful cathartics. Sometimes tenesmus, strangury and irritable bladder. If abdominal pain threatens to run around loin it may mislead and make you think of renal colic from stone. Evacuations are scybulous like sheep dung, tongue generally furred. There is nausea and vomiting—biliary, marked. Breath is very fetid. Urine is pale, generally copious. There is blue line on gums. Colic may alternate or accompanying cramps in legs and arms and joints, and these parts may later become paralyzed. In rare cases cerebral functions are disturbed only in acute cases. If lead colic has lasted some time the complexion is sallow, anæmic, muddy.



PROGNOSIS.—1 per cent. fatal. Symptoms subside in 3 to 25 days.

TREATMENT relieves symptoms and hastens recovery. Relapses are frequent if causes remain. 1, relieve pain; 2, evacuate bowels; 3, get rid of lead. Relieve pain by Opium. Warm bath is grateful. To act on bowels use *Ol. Ricini* or Black Draught, or if it fail *Ol. Tiglii*. Move bowels every hour. Hypodermics of Morphia will not antagonize cathartics, Opium by mouth will. Use enemata. To remove lead from system have frequent baths and friction, also sulphur baths, use of Sulphuric Acid, etc., sulphates. Alum is used, thus gr. 20, Opium gr. 1, every 3 hours.

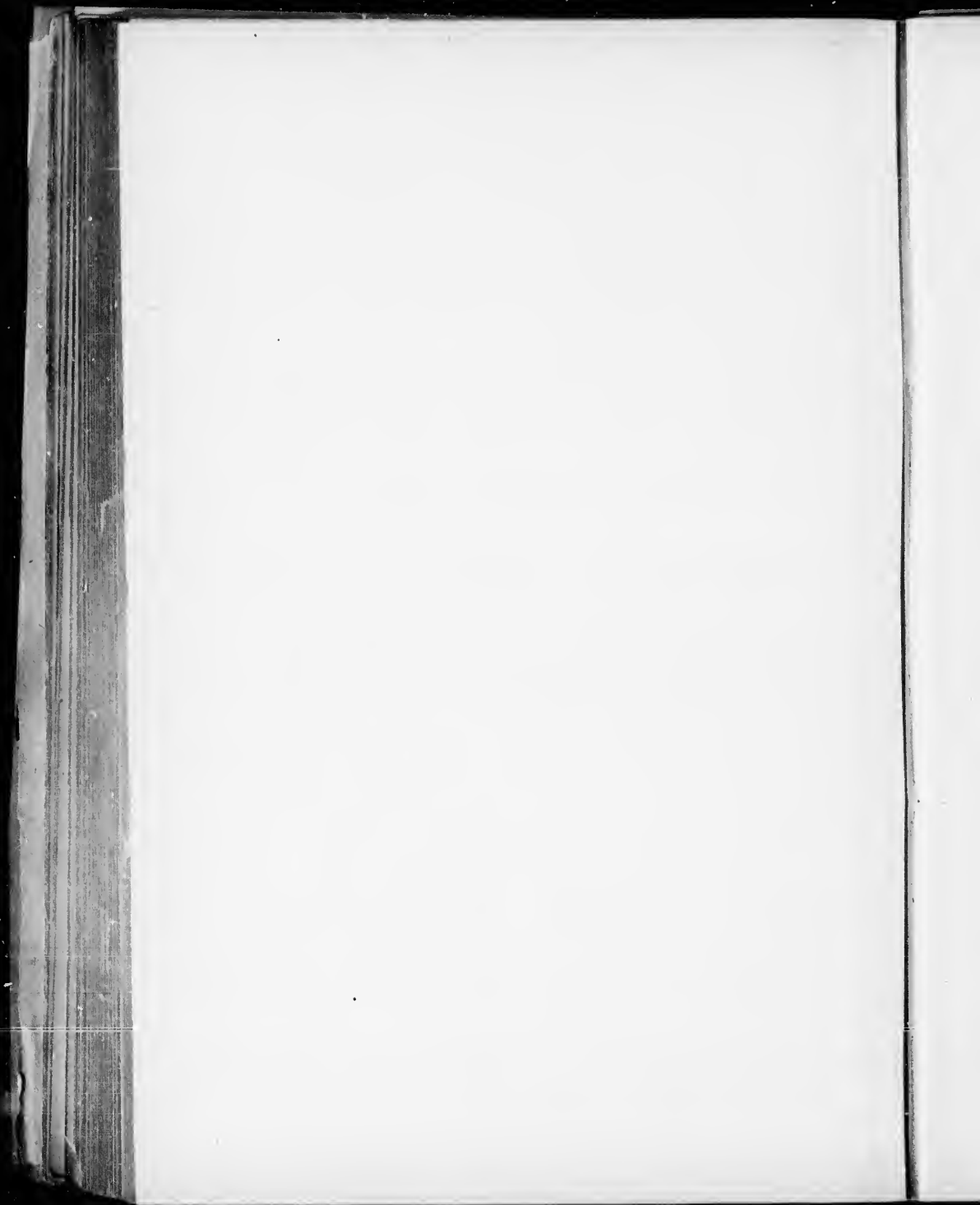
LXXVI. CONSTIPATION.

Costiveness is when secretions are deficient in amount, so absolute amount of feces is too small. Symptoms and effects—intestine serves to remove effete material from blood. Their retention produces general symptoms, as want of cerebral activity, poor sleep, drowsiness, skin unhealthy, greasy, sebaceous secretions excessive, complexion alters and digestion is uneasy, flatulence common. If secretion of liver is deficient, stools are offensive, pale, etc. If scybala are retained they produce irritability lower down, hence diarrhoea simulated. This is especially the case in elderly people. If much mucus be formed stools are dark, slimy, gelatinous.

CAUSES OF DEFECTIVE SECRETION.—1. Obstruction of circulation of heart alters secretion of liver—sluggish circulation. 2. Deficient supply of blood does same, as in those who overwork brain. Excessive perspiration has same effect. 3. Anæmia and chlorosis also act by defective supply of blood. 4. Use of alcohol. 5. Opium. 6. Febrile state generally, check secretions. Constipation means less frequent evacuation of large bowel than normal. Habit has great influence over this.

EFFECTS OF CONSTIPATION.—1. Gradual distention of gut, so that there is greater contractile power required to propel its contents. 2. Not only are pouches enlarged, but actual hernial protrusions of mucous coat through muscular layer, occurs, covered only by peritoneum. These protrusions contain mucus or feces, these are common in sigmoid. 3. General effects on system. Reabsorption into system of matter from bowel, hence symptoms like lack of excretion, as in costiveness, but not to such an extent. 4. Accumulation of feces produces pressure on nerves, hence pain in groin, sciatica inside of knee from pressure on obturator nerve, on veins, give varix, piles, varicocele, on bladder, frequent micturition. Jaundice from pressure on common duct. Belly is apt to become full, tumor in cæcum, sigmoid, rectum or course of colon.

CAUSES OF CONSTIPATION.—1. Deficient excretion. 2. Loss of contractile power in muscular coat from (a) over-use of purgatives, (b) disease of spinal cord, (c) over-distention by accumulation of contents, (d) from lead poisoning, (e) inflammation of intestines. 3. Pain in rectum from fissure, abscess, ulcer, piles, etc.; for fear of pain patient postpones going to stools, hence misses. 4. Weakness



of auxiliary expulsive muscles, as of abdomen from paralysis, indolence, or painful state of abdominal parietes, as abscess, boils, etc. 5. Habitual neglect of bowels. 6. Mechanical obstructions, stricture, invagination, tumors, etc.

TREATMENT OF COSTIVENESS.—Promote excretion, especially from liver and bowels, hence blue pill followed by saline. But as a rule use slower purgative as pill Aloe Co. or Pill Rhei Co. A week of Aloes will do, all stronger purgatives will do and do it more permanently. Use of copious drinks of water is good, promotes removal of effete matter from system. Mineral waters (mild) are good, Selzer or Vichy, etc. Accessory foods, as coffee, beer, wine, etc., arrest tissue waste, are unsuitable; but milk, chocolate, soda water, etc., are good.

TREATMENT OF CONSTIPATION.—Determine cause and remove it. Always go about it with care, and find cause. 1. Correct deficient excretion. 2. If purgatives have been abused abandon them, prohibit alcohol. 3. Promote contractile power of abdominal muscles and bowel, hence exercise, walking and riding, cold sponging, kneading daily of abdomen. A wet compress covered by oil silk and put to abdomen and worn all night is good. Nux Vom. continued for a long time is good. May be combined with Belladonna, Iron, etc. Belladonna alone may do if effectively persisted in. Give Ext. Belladonna gr. $\frac{1}{4}$ th every morning fasting, *i.e.*, on empty stomach for a week, then 2 pills every morning, then 3, stopping when bowels act all right. Galvanic current through abdomen is tried. Enemata improve contractile power of intestine as well as act directly by stimulating. Try water, or glycerine a small quantity in a small quantity of water. Glycerine dr. 1 in aq. 3 oz., thrown in slowly, produces in $\frac{1}{2}$ hour a copious evacuation. Is a very favorite means. Glycerine suppositories are also made, are very effective. Tonics are also useful, hence Quinine, mineral acids, etc. Insist on stated hour for stool. Food should be mixed—animal and vegetable, but vegetables make some flatulent. Let food be digestible, but it may contain a certain amount indigestible for fecal bulk, as oatmeal, bran bread, cracked wheat. Fruits are also useful, especially early in a.m. With some a drink of water before bed will give evacuation in a.m. In giving purgatives do not give active ones, but persistent use of mild ones,—Aloes, Rhubarb, occasionally Ol. Ricini. If you use mineral waters use purgative ones.

LXXVII. ENTERLAGIA OR COLIC.

Symptoms are: 1. Pain—paroxysmal, intermittent, but may be uniform and continuous—violence may be very great, agony. 2. Abdominal muscles are tense, rigid, sometimes knotted by spasm. The violence of pain may produce 3, temporary depression, hence weak pulse, cold extremities, convulsions in children. The pain is generally relieved by pressure, and, after leaving, the abdomen is soft. 4. Constipation is generally present, unless in bilious colic. 5. Vomiting is often present. 6. There is no fever, no increase of pulse, urine varies.

PROGNOSIS.—In a few cases symptoms increase in spite of remedies, vomiting increases, stercoraceous vomiting, collapse, tympanites, hiccough and sinking; but majority of cases recover. In above bad case it is spasmodic ilius, or obstruction of bowels or paralytic ilius. But even such desperate cases are not to be abandoned, for recovery may be had in some of them.

DIVISIONS OF COLIC.—1. Simple colic, flatulent, nervous or spasmodic. 2. From injurious food. 3. From morbid secretions. 4. Lead colic.

SIMPLE COLIC.—Rapid flatulence, irregular distention and contraction of intestines, borborygmi, etc. In nervous and spasmodic colic there is less distention by flatus. In all these forms there is twisting pain in region of umbilicus, extending to up or down side, relieved by pressure. When violent, countenance is pale and anxious, and collapse may lead you to fear perforation. Obstinate constipation is present. When bowels move they are depraved. These several forms of colic occur in hysterical, hypochondriacal, alcoholic people, in those weakened by hæmorrhages or over-lactation—other causes are cold, fright, etc. 2. But other causes arise, as from bad food, hence the colic of eatables. Colic comes on 3 hours after eating. Vomiting and diarrhoea may ensue. Is often present with headache, costicaria, etc. Caused by imperfect mastication, acid wines, shell fish, cheese, sausages, some mushrooms. 3. Bilious colic (morbid secretions), furred tongue, mental depression, muddy skin, may be preceded by odd symptoms. There may be violent vomiting of bile and purging of dark, bilious stools, or watery and light colored. There may be considerable prostration and collapse like cholera. It is almost identical with Canvian cholera, and may end fatally. Its causes are same as summer cholera. Endemic causes—occurs in summer. 4. Retained excreta are frequent causes of colic in children. Chief symptoms are abdominal pain (draw up legs), tense abdomen, incessant crying, watery evacuations, curdy, etc. It may induce mucro enteritis, or from excessive action may kill from exhaustion.

DIAGNOSIS OF COLIC.—1. Strangulated hernia. Colic is known by absence of hernia at any natural hernial openings. Examine carefully for slight hernia. 2. Perforation of intestine or stomach. This is known by intensity and persistence of the collapse, by differences of the character of the pain which is pungent, agonizing instead of twisting, by its spread from original site, by being aggravated with pressure, progressing rapidly to fatal issue. 3. Passage of renal or biliary calculi. Pain of gall stone is more intense, vomiting is more frequent, and jaundice sets in in 36 to 48 hours usually. There may be history of previous attack. In nephralgia pain runs down to testicle, there is frequent micturition, bloody urine, etc., and constipation is not so common. Intussusception in children, colic occurs after stool or action of purgative. There is a constant desire to stool and discharge of only a little bloody mucus or blood, and a tumor may be detected, usually per rectum, also inability to introduce a long tube up rectum. Remember that colic may be due to gall stones. Mucro enteritis,—absence of fever, tenderness on pressure, etc.

TREATMENT.—Relieve pain, evacuate bowels. In simple colic, Tr. Opii m. 30. Spts. Chloroform. Chlorodyne is good. Wurmth to abdomen by stupes. Diffusible stimulants, as cup of hot ginger tea. If constipation has existed several days and no sign of inflammation, give enema and follow by Calomel and Opium, or Ol. Rⁱ ini 1 oz., Tr. Opii m. 15. In flatulence Pil. Asafoetida Co. If exhausted, give alcoholic stimulants. If colic be due to indigestible food and no vomiting, give emetic, as Ipecac, and after emptying stomach give Calomel, and follow by a saline. Colic from morbid secretions often cure themselves by vomiting, encourage by warm water. Treat severe cases like Canadian cholera. Stupes to abdomen, warm bath sometimes is grateful. Friction to abdomen or stimulating liniments in children.

LXXXVIII. PERITONITIS

May be acute or chronic, general or local.

ACUTE GENERAL PERITONITIS is nearly always secondary, but in some cases you cannot find cause, hence idiopathic peritonitis, but this form is exceedingly rare.

SYMPTOMS.—Distinct rigor in idiopathic form, but this is absent in secondary form, which is the most frequent, so rigor is rare. Pain is one of earliest and most characteristic symptoms, in all cases is acute, pungent and considerable in degree, but in some cases pain is moderate except on movement or pressure. Site of pain is most frequent to begin in iliac inguinal or hypogastric region, extends all over belly, but always remains worst over site of commencing pain. Patient lies on back, knees flexed, ditto thighs, or on side with thighs flexed. If pain is extensive and severe the respiration is quick and short, almost altogether thoracic. Appearance of patient is: countenance anxious, pale, sharp, dark, drawn features, tongue white, thirst severe, nausea common, ditto vomiting of colorless or bilious matter, especially if upper part of abdomen be affected. Constipation is the rule. Urine scanty, dark, acid. Surface hot, dry, temperature elevated, but may not be as in traumatism, or perforation when shock persists. But as a rule there is elevation of temperature. Pulse small, wiry, hard and constricted, frequent. Abdomen tense and resisting, owing to increased excitability of muscles caused by inflamed peritoneum. This rigidity is constant, not caused by hand, but existing before you put hand on. Abdomen becomes more or less tympanitic, in extreme cases like a drum. This distention is from relaxation of intestinal walls from paralysis of muscle coat rather than from excess of gas. In some cases no distention occurs of abdomen, but it is always hard and rigid. As effusion occurs the rigidity yields somewhat, hence doughy feeling, and at length (rarely) fluctuation cannot be observed. Then dullness along flanks. In general peritonitis there is general and uniform distention, contrary to what is found in partial peritonitis. Before effusion a friction sound may be heard or felt over inflamed part, not often made out distinctly, though.

PROGRESS AND COURSE is generally rapid. If unfavorable, all symptoms become aggravated for 2 to 3 days, with remissions, and as death nears, once more abdomen gets tympanic, displacing liver, lungs, etc., up, hence respirations rapid, 50 to 60 per min., heart perhaps beating in 2nd space. Pain then subsides suddenly, countenance pinched, vomiting frequent, biliary or mucous. Bowels may be relaxed. Pulse small, thready, rapid. Surface cold and damp, beginning in extremities, which become livid. There is hicough, short breathing, general asphyxia, death from asthenia, sometimes preceded by coma, convulsions. The case may be rapid, ending in even 48 hours, as in those of bad habits, especially in perforation. More frequently peritonitis lasts a week. If disease is to terminate favorably, symptoms gradually change, features get fuller, pain and rigidity subside, pulse larger and softer, vomiting ceases, bowels act, etc. In such cases recovery is perfect. In other cases recovery is slow and lingering, taking 2 to 3 months. In some of these effusion is purulent, and points into hollow viscera or parietes. In other cases it becomes chronic, but this is rare in uncomplicated cases.

PARTIAL PERITONITIS (various forms) is an extension of inflammatory process from inflamed ovary, uterus, liver, stomach, intestine, cæcum, appendix, hernia, internal strangulation, invagination, obstruction from surgical operations. In these a local peritonitis is started. This process does not extend over large area, but that part of peritoneum in immediate neighborhood.

SYMPTOMS OF LOCAL PERITONITIS are less severe than general peritonitis, and vary with locality engaged. If liver be seat as in a peri hepatitis, you have pain and tenderness in right hypochondrium with hepatic disturbance as jaundice; severe constitutional symptoms as urgent vomiting; great epigastric pain if stomach be seat of trouble; obstinate constipation and pain lower if bowels are involved. A great many varieties of pelvic peritonitis, hence pain in hypogastrium, formation of tumors pressing on and interfering with functions of organs, etc. Causes of Pelvic P. in females are very numerous, as puerperal diseases, abortion, gonorrhœa, suppression of menses, operations not aseptic, uterine injections, extension of metritis or plenritis, Salpingitis, etc., extra uterine pregnancy, irritation of tumors. Appendicitis or cæcitis are imported causes, as foreign bodies in appendix by irritation acting to produce local peritonitis. Appendix is seat of ulceration in $\frac{2}{3}$ ths local cases of fatal peritonitis in right iliac region. The cæcum may be seat of ulceration, as typhoid, tuberculous, simple. The lining membrane may be irritated by accumulated feces. Foreign bodies also incline to lodge there.

TYPHILITIS OR PARATYPHILITIS thus may cause local peritonitis. There is acute severe pain in cæcal region, tenderness there soon, and deep-seated swelling or fullness. Dullness on percussion there, obstinate constipation, vomiting, and more or less fever. In these cases a tumor is well made out from the outset. But if trouble began in appendix, tumor is not made out till after peritonitis has begun, still appendix is more frequently the cause than the cæcum. The deep-

seated tumor is immovable, not at first in parietes, but wall can be moved over it, later adhesions form, and mass is immovable. The pain in this region is often attended by retraction of testicle, pain or numbness of thigh, flexed thigh, patient on side or back. Typhlitis is often preceded by functional disorder of cæcum, as colic, tenderness in that region, constipation. This is not the case in appendicitis, attacks of which are usually sudden. Perforation of appendix is a common cause of local peritonitis in right iliac fossa. First and most constant symptom is sudden and severe, pain in right iliac fossa, and probably this is due to perforation. Vomiting soon follows, and constipation. There is more or less fever. Examination finds deep-seated circumscribed sense of resistance, rarely felt early though. In more satisfactory cases an actual circumscribed swelling just below ant sup spine of ileum and $1\frac{1}{2}$ in. above Poupart's ligament. This is produced by inflammatory products. Abdominal wall at first moves over such tumor, but rarely can you detect a well-defined distinct tumor in appendicitis, mere tumefaction rather. If a cæcitis, a resisting circumscribed induration with dullness follows the tumefaction. In both, pus may form behind the cæcum. If pus be small in quantity it may not produce tumor or tumefaction. In some cases large quantity of pus acts similarly. The pus may infiltrate up or downwards. Suppurating appendicitis or cæcitis may not cause peritonitis, but phlebitis, extending to portal vein, hence pylephlebitis and abscess of liver. At autopsies look for situation of appendix. It varies in situation, may be adherent behind cæcum or twisted around ilium, or curved at a sharp angle on itself. It may be fixed or free, with or without mesentery, may be long or short, valved or not, sacculated, bulbar or not. Length varies from 3 in. to 6 in., and cavity is generally occupied by mucus. The valve at orifice narrows its opening, hence favors the incarceration of foreign bodies. This valve is most marked from 3 to 12. In examination of 300 bodies every 3rd person shewed traces of former inflammation about appendix, and 5 per cent. of all the 300 were ulcerated. When peritoneum is involved by extension of inflammation, results are : 1. Recovery, resolution takes place, symptoms gradually abating. Most of such cases were probably cæcitis rather than appendicitis. But appendicitis sometimes resolves—rarely. Reason is perforating ulceration, tuberculous, etc.; is more frequent in appendix than cæcum. 2. A less perfect result occurs by adhesions which interfere with actions of bowels, hence obstruction. 3. The local inflammation may end in suppuration, either circumscribed by adhesions, hence tumor of peritoneal abscess which may suddenly break into peritoneum and excite fatal peritonitis. If abscess contents be partially absorbed, a cheesy mass is left; but if feces have escaped in abscess, you will have a fecal abscess which will not resolve, but fecal fistula forms, hectic symptoms, etc. The abscess may excite cellulitis in neighborhood, hence paratyphlitis, which may suppurate and form an extra peritoneal abscess. The pus of this may burrow in many directions down along psoas to point below Poupart's or along pyramiformis and point in gluteal region, or it may infiltrate outwards and for-

wards, and point above Poupart's, or it may burrow up and backwards, perforate and present as lumbar abscess, or up behind colon as high as liver or diaphragm. May even perforate pleura, or even perforate lung, and be expectorated. The extra peritoneal abscess may open into some of the hollow viscera, into cæcum the most favorable, or into bladder or rectum, or open directly through abdominal parietes. The discharge of pus is followed by hectic, etc., and tardy recovery. In these abscesses there is always danger of it bursting into peritoneal cavity. In some cases of suppurative cellulitis in right iliac fossa there is flexion of thigh, numbness or pain in thigh, later there will be fluctuation. If ilio-cæcal vein be involved you may get pyelephlebitis and abscess of liver. In some cases general peritonitis is induced suddenly without previous local peritonitis. Peritonitis from perforation of any of the hollow viscera, whether from traumatism or disease with extension of contents, there is intense general peritonitis. Generally without any warning patient is seized with intense abdominal pain, generally described at one spot, the site of trouble. But pain soon becomes general. There is extreme and sudden depression, shock, countenance pale and haggard, pulse rapid, weak and small. Distressing nausea and vomiting. Reaction is slight if any. Surface cold, constipation, vomiting, changes to regurgitation, stupor, coma, death, rapidity depending on nature of injury and site. If it attacks persons of weak habit of body—as aged, intemperate—in other diseases, as typhoid, phthisis, cancer, etc., the onset may be marked. Local pain may be very slight or even absent, hence malady overlooked, but there is local tenderness, and general symptoms are alarming.

PATHOLOGY OF PERITONITIS.—Introduction (of rabbits) into peritoneal cavity of septic matter did not cause peritonitis if quantity was large, but what it could absorb or encapsule in one hour. Pure cultures of bacteria which cause suppuration did not do so if quantity was not large and fluid was not irritating. But if there was stagnant solution in which bacteria could grow, or when there was a wound of peritoneum, then peritonitis did occur. Idiopathic peritonitis can only occur when there is an injury of peritoneal membrane, or when a stagnant fluid in cavity exists to give germs a chance.

MORBID ANATOMY.—1st stage, dryness and increased vascularity of serous coat. Redness deepest where inflamed parts are in quantity, opacity of membrane which becomes rough. 2nd stage, exudation of fibrin—causing adhesions, varying from a film to thick layer; at same time there is effusion into subserous tissue, all coats of intestine are thus thickened. In asthenic cases effusion is corpuscular, non-fibrinous, hence sero-purulent or purulent. Quantity of effusion may be very great. Ulceration is not frequent in peritoneum. Gangrene is rare except in strangulation of bowel. On opening cavity gas may escape even when no opening of bowel exists. Rare in children, except in new born.

CAUSES OF PERITONITIS DIVIDED.—Local causation, general and mixed causation. Local causes—local irritation in adjacent parts extending to peritoneum in 50 per cent. of cases, as hernia—external and internal. Invagination,

etc. Perforation of stomach or intestine. Disease of gall bladder and liver, of cæcum and appendix, of bladder, and of pelvic viscera. Typhoid ulceration. General causes—in changed states of blood, Bright's, pyæmia, puerperal fever, pneumonia. Mixed causes—changes in constitution followed by tuberculous or cancerous disease of peritoneum, also in hepatic cirrhosis, heart disease, etc.

DIAGNOSIS ACUTE PERITONITIS.—1. Colic, no rigor in colic, no fever, pain relieved, or not increased by pressure; pain is paroxysmal, and intervals of no pain, sets in suddenly, vomiting not so frequent. 2. Mucous enteritis—in enteritis pain is not so burning or violent, is gripping. Tenderness is not so marked, needs deeper pressure. Movement, breathing, coughing does not cause such agony. Pulse is not wiry. There is diarrhoea instead of constipation. Vomiting is earlier. 3. Hysteria—may simulate peritonitis, but there is no fever, tenderness is greater on slight than deep pressure, especially if attention be diverted. Expression is hysterical, pulse is not wiry, nausea and vomiting are absent, woman is hysterical. In addition there may be other hysterical symptoms, as globus, etc. Pain is greatest when quiet, not so great when moving and talking. Symptoms incongruous. 4. Suppurating embolism of mesenteric artery may be suspected if conditions to cause it exist, also if embolism has occurred in other organs, if abdominal pain, bloody stools and other symptoms of peritonitic exudation are present. 5. Rheumatism of abdominal muscles is easily noted.

PROGNOSIS OF PERITONITIS.—If in healthy strong person treated at early stage you can prognose good, unless peritonitis be asthenic, slow, complicated with some other disease, as Bright's, or some local disease, then it is less hopeful; if it follows rupture of viscus is almost surely fatal.

TREATMENT OF ACUTE P.—Ascertain cause of disease if possible; in almost all cases it has a cause. 1. If from local cause, as extension from cæcitis, or if from strangulation, invagination. These cases comprise about 50 per cent. of all cases. If seen early, and patient be young and vigorous, if pain be severe, then bleed locally by 15 to 20 leeches for adult, principally about most painful area. Then apply warm fomentations and give Opium. Opium relieves pain, opposes nervous prostration, etc. Rules to give Opium: give enough to relieve pain quickly, enough to reduce frequency of the pulse. Patient must be watched; pupils, respiration and intelligence noted, respiration not below 12, nor irregular at all. Somnolence must never be so great that he cannot be easily aroused, nor should you continue Opium when pupils are much contracted. Begin with Morphia gr. $\frac{1}{2}$ or Opium gr. 2, and repeat every 2 to 3 hours according to symptoms and effects, reducing dose if effects are too great. If dose is vomited give hypodermically. There is often an increased tolerance of Opium. Continue Opium till disease is subdued. While treating, apply heat to abdomen, as hot plate wrapped in flannel, stupes, etc. The Germans apply cold instead of heat. This is best suited to early stage and high temperature. If case resists all above measures try leeches a second time, especially in strong patients. At outset of peritonitis some use depressants, as Aconite Flem. Tr. gtt. 1 or Veratrum Viride.

Dr. Ross does not use it. Mercurry is often used, but is not always safe, as when cause is mechanical, as obstruction of some form, or in Bright's, pyæmia, erysipelas, or in perforation, cancerous or tubercular diseases on account of constitutional effects. So only a few varieties tolerate Mercurry, as idiopathic forms, or peritonitis from extension of inflammation, and even in these cases there is doubt if it does any good. It has some power to prevent plasticity and organization of exudation. Calomel gr. 1, 2 to 4 q. h. In puerperal cases, septicæmia or pyæmia, give Quinine in large doses. For irritability of stomach if Opium does not allay, then give HCN and Morphia or Spts. Am. Arom., or sm^l drinks of hot water, or small pieces of ice, or soda water, etc. Only give small quantities at a time, a tablespoonful. Counter-irritation to abdomen is not employed till active stage is over, then a large fly blister may do good, then tonics, stimulants come in use. Small doses of turpentine seem good. Tympanites may need special treatment, as an enema of Asafetida, or oz. of Ol. Turp., made into emulsion and given as enema. Rectal tube may be used. In extreme tympanites puncture intestines and allow gas to escape. Is a serious operation, may allow contents of intestines into cavity of peritoneum. In all cases absolute rest, at outset no food whatever. Later only small quantities of blandest fluids, as a little barley water $\frac{1}{2}$ oz. every $\frac{1}{2}$ hour, or gum water, gradually increasing diet. If fecal abscess form, treatment must be supporting. Partial peritonitis calls for same treatment. Typhlitis and appendicitis—treatment is the same as general peritonitis, but lately it has been advised to keep bowels open by salines, this is yet "sub judice." Do not use salines if perforation has occurred. If ecchysis from impaction of feces, remove by mild purgatives, unless an obstruction be caused by accumulation. If perforation peritonitis, give Opium, absolute rest, stomach empty, so only wash out mouth, stimulants by rectum or stomach.

OPERATIVE INTERFERENCE.—Perforating appendicitis—cases are common and urgent. Case is fairly easy of diagnosis, and its treatment by laparotomy is generally indispensable—needs incision to be made as soon as possible after recovery from shock—the sooner it is done the better the chance of success. The great difficulty is early diagnosis. If delay seems warranted the resulting abscess should be incised as soon as it is evident, and this is usually on 3rd day after first characteristic symptoms. Typhlitis, even if complicated with peri or para typhlitis, there is not the same need for early surgical interference, for the peritonitis is less severe and less rapid. Sands of New York says it can wait a week or 10 days to see if it needs operation. A large proportion of these cases recover spontaneously, hence treat expectantly till need of operation is seen. The risk of operation is entrance of fecal matter into peritoneum. Yet Dr. Weir of New York advocates early operation as no chance is given for abscess to open into peritoneum. Since both cæcum and appendix are covered by the peritoneum, a suppurative peritonitis must be set up before perforation, or else adhesions form, no perforation occurs, and so a sub-peritoneal abscess forms. Some favor aspiration to assist diagnosis, but many prefer an exploratory incision. If peritonitis

be spreading rapidly, *i. e.*, a general peritonitis be setting in, operate at once; but if it remain local, then any time in a week is time enough to operate, and an exploratory needle may be used to diagnose. Typhoid perforation or rupture of gall bladder clearly need operation, there is escape of material into cavity. But results are not satisfactory. In acute suppurative peritonitis escape by laparotomy should be afforded—should be treated by early and sufficient drainage, according to Tait.

CHRONIC PERITONITIS.—Two chief forms of mode of invasion: 1. Chronic following acute,—rare. 2. Disease insidious in outset. This second class is not infrequent, and is usually associated with cancerous or tuberculous diathesis. First form—may be localized or general. If local following acute, symptoms do not completely subside, temperature oscillates, swelling may remain, pain, rigid muscles over place, and later abscess forms. If general, the bowels have contracted adhesions, patient is subject to thirst, vomiting, nausea. There is irregular state of bowels, evacuations unhealthy, skin dry and hot, harsh, tongue smooth, pain in abdomen is felt on sudden movement of body. There is almost always tenderness on examination, and after a time suppuration is set up with hectic temperature. Copious effusion may now occur, and patient may die from debility.

DIAGNOSIS.—If history of this following acute attack is plain, diagnosis is very easy. But often history is vague, as illness with abdominal pains. If with this there is abiding abdominal pain, constipation, etc., irregularity of abdominal surface, then diagnosis is sure. Second form is insidious, no complaints till disease is present plainly. Is oftenest tubercular, proved by following signs as foregoing of chronic peritonitis, then patient is under 30, is of marked tubercular diathesis, heredity, following perhaps some exanthem, deficient hygienic conditions previously, hectic rather than inflammatory fever. Bowels irregular; if diarrhoea is due to tuberculous ulceration, there is uneasiness and deep-seated pain. Lying on back, abdomen looks full, has lost its suppleness, wall and contents move *en masse*, and it seems as though you could move muscles over abdominal contents. If disease be far advanced fullness contrasts with emaciation over ribs. Fullness is less marked than ascites, gives a more or less resonant note, and effusion is generally scanty, may be bound down and simulate a cyst. Also exclude causes of ascites, as liver, cardiac, renal disease. There are probably signs in lungs of phthisis.

CANCEROUS FORM may be suspected if patient is beyond middle age, if colon be cancerous, if there is emaciation and cachexia, if nodules can be felt. Tenderness is not so great as in other forms, and there is more effusion than tuberculous form. It is often associated with cancer in liver, spleen, etc., and often a tumor can be felt in some place. Exclude cirrhosis of liver, amyloid disease, etc., and exclude other causes of ascites. In simple chronic peritonitis, adhesions of viscera may be marked. In tuberculous peritonitis intestines may be matted, bound to organs, walls, etc. Adhesions may be dry, no effusion. Tuberculous

ulceration is often found in mucous membrane, and perforations are common opening into other loops of intestines or into pouches formed by adhesions, hence faecal abscess. Tubercles are found all over.

CANCEROUS PERITONITIS.—Nodules found sown all over peritoneum, and omentum thickened and infiltrated with these nodules—is drawn up to colon. Mesentery also in same condition. There is abundant effusion of serum. Effused fluid may be truly ascitic from chronic inflammatory action, also from adhesions contracting and obstructing portal circulation. Mesenteric and lumbar glands enlarged.

TREATMENT.—In simple form, rest, fomentations, and in later stages fly blisters. Some punctate with Croton Oil, or friction, massage to promote dispersion of fluid by weak Mercury or Iodine ointment. Alternate by Mercury and Iodine, together with diuretics. Tonics, anodynes, etc.

TREATMENT OF SECOND FORM.—Incurable, although recently some say tubercular cases have been saved by operation. Avoid mercurial treatment, use tonics, fresh air, anodynes. If fluid accumulates too much, you can aspirate to relieve. In tubercular cases many laparotomies have been performed, relieve symptoms and prolong life, open and drain.

TREATMENT OF CHRONIC CÆCITIS.—If much tenderness and pain, a few leeches, and follow by Opium. Follow by mild counter-irritation. Regulate bowels by mild enemata. Give tonics. Remember faecal abscess may have formed and need treating.

LXXIX. FATTY DEGENERATION OF LIVER.

Normally liver contains fat, varying with quality of food, etc. It is necessary to distinguish primary degeneration from that following organic disease, as amyloid, etc. In this latter, impaired nutrition of cells leads secondarily to fatty degeneration. Is a grave lesion then.

PRIMARY FATTY DEGENERATION.—Liver enlarged laterally chiefly, edges rounded generally. Peritoneal covering is not altered. Substance of liver is soft, pits and color of faded leaf. Section in early stages is nutmeg. Specific gravity reduced, floats. It leaves a greasy stain. It is pale, anæmic from enlarged fatty cells compressing capillaries. Microscopically $\frac{1}{2}$ to $\frac{2}{3}$ of cells are filled with oil globules, nucleus disappears and in advanced cases cell disappears.

CAUSES.—1, Excess of fat in blood, hence from over-feeding or indolence; 2, from free use of alcohol; 3, when type of respiration is low; 4, when exhausting symptoms of disease, as rapid emaciation, occurs, and blood gets loaded with fat from adipose tissue. So has been met in phthisis frequently, also after exanthems, acute skin diseases, carcinoma, dysentery, in bed-ridden patients.

SYMPTOMS.—None characteristic, slight forms are not pathological. In advanced cases you have enlargement of liver with smooth surface. If abdomen be lax, you may feel liver is soft and doughy. Negatively there are no signs of portal obstruction. The faeces are apt to be disordered, pale or dark, a tendency to diarrhoea. Skin gets smooth and oily. Complete arrest of secretion of bile is very rare, deep jaundice never occurs. So in diagnosis, look to the cause and enlargement of liver in absence of ascites and jaundice. In very rare cases extreme anaemia, great exhaustion and symptoms of complete suppression of bile somnolence, delirium and coma.

TREATMENT.—Not much dietetic, lessen fats and starches. Fruits allowable in large quantity. Prescribe plenty of exercise, mild salines, laxative mineral waters, etc. Do not use chologogues.

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