

and Eastern America, that is, on each side of the North Atlantic. It has for a long time served as an innutritious food, and as the basis of vegetable jellies for the table; it is also, in some localities, fed to cattle, and used as a stuffing for cheap mattresses. Its employment in medicine is of recent date, and entirely unimportant. It is collected on the coast of Ireland and elsewhere in Europe, also upon that of New England and elsewhere in America. For medical or table use it is bleached in the sun, washed, and dried.

**DESCRIPTION.**—Irish moss shrinks considerably in drying, and if exposed to the sun, or repeatedly wet and dried, bleaches to a yellow color. It is, when dry, hard, horny, and brittle, but resumes its original size and consistence after long soaking in water. In boiling water it almost completely dissolves. Taste mawkish, mucilaginous, and more or less saline, according to the thoroughness with which it has been cleansed. It will make a stiff jelly with twenty or thirty times its weight of water.

**COMPOSITION.**—Chondrus consists chiefly of a mucilage, common also to many other algae, swelling and nearly dissolving in water, and drying to a hard, transparent substance. It is precipitated by alcohol, and holds tenaciously about one-seventh its weight of mineral matter. It contains, in common with other marine algae, minute quantities of iodine and bromine compounds.

**MEDICAL EMPLOYMENT.**—For colds, coughs, and especially acute pharyngitis, a thin mucilage (decoction) made of Irish moss is a popular household remedy, and corresponds exactly with the mucilage of elm and flaxseed, made in the same way. It may be sweetened and flavored with lemon. Boiled with milk it makes an agreeable jelly ("blanc-mange"), often used as a sick diet, whose value depends on the milk.

W. P. Bolles.

**MOSESSES.**—(Class *Musci*.) The true mosses, while very ornamental, and of great biological and botanical interest, are insignificant from an economic standpoint, while to the *Materia Medica* they yield not one important substance. Some of them, like *Sphagnum* and *Polytrichum*, have, upon totally unscientific grounds, been used domestically in menstrual disorders. Others, like *Funaria hygrometrica* Hedw., have some reputation as expectorants, the effect probably depending chiefly upon the syrup used as a vehicle. Many have been very useful, in the absence of more refined agents, as substitutes for tow, oakum, and lint. The preceding, much used under the title of Mosses, are not of this class at all.

Henry H. Rusby.

**MOUNTAIN SICKNESS.** See *Altitudes, High*.

**MOUNTAIN SPRINGS.**—Lancaster County, Pennsylvania.

**POST-OFFICE.**—Ephrata. Hotel.

**ACCESS.**—Via Reading Railroad. Trains leave Reading Terminal, at Twelfth and Market Streets, Philadelphia, daily, except Sundays, at 10 A.M. and 4 P.M., arriving at the springs at 12:44 and 6:45 P.M.

This pleasant resort is located on the western slope of the Ephrata Mountain, one of the highest points of land in Lancaster County. Many charming features of climate and scenery are united here. The visitor will find pure air, a comfortable and well-kept hotel, excellent fishing, and delightful surroundings at this summer resting-place. The water of the Mountain Springs is celebrated for its purity and sparkle. It has not been analyzed, but we are credibly informed that it contains iron and carbonic acid gas. The springs discharge about three thousand gallons per hour.

James K. Crook.

**MOUNT CLEMENS MINERAL SPRINGS.**—Macomb County, Michigan.

**POST-OFFICE.**—Mount Clemens. Hotels.

**ACCESS.**—From Detroit via Chicago and Grand Trunk Railroad, twenty miles northeast. These waters are very

strong brines, as shown by the following analyses made by Prof. S. P. Duffield:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Mount Clemens Mineral Well. Grains.	Media Spring. Grains.	Soolbad Spring. Grains.
Calcium carbonate	0.98	91.0	Trace.
Magnesium carbonate	.7	.7	Trace.
Iron carbonate	5.6	.....	.....
Sodium sulphate	.....	.....	.....
Calcium sulphate	100.56	14.3	44.0
Potassic salts	.....	Trace.	Trace.
Sodic salts	.....	.....	.....
Calcic salts	.....	11,741.0	11,181.0
Magnesian salts	.....	.....	.....
Iron sulphide	.....	.....	.....
Sodium chloride	11,900.0	.....	.....
Calcium chloride	984.5	.....	.....
Magnesium chloride	648.48	.....	.....
Magnesium iodide	.07	.....	.....
Magnesium bromide	6.37	.....	.....
Iron	.....	8.5	Trace.
Alumina	29.47	29.0	11.21
Silica	27.6	28.0	.....
Bromide	.....	8.5	Trace.
Iodide	.....	.07	.05
Ammonia	.....	Trace.	Trace.
Organic matter	.....	.....	.....
Total	13,654.33	11,921.07	11,236.26
<b>Gases.</b>			
Hydrogen sulphide or dihydrogen sulphide	40.00	40.00	33.00
Carbonic acid	5.85	.....	.....
Nitrogen	Present.	.....	.....

These waters resemble those of Achsel-Mannstein, in Bavaria. It is necessary to dilute them both for internal use and for bathing. They have acquired considerable reputation in the treatment of scrofulous disorders of the skin, bones, and joints, and for the improvement and even cure of paralysis when the disease depends chiefly upon innervation without decided lesion of the brain or spinal cord. Cases of chronic rheumatism with stiffened joints and obstinate cases of neuralgia may also find relief. The waters are used commercially.

James K. Crook.

**MOUNT DESERT, MAINE.**—The island of Mount Desert, the largest one on the New England coast, lies off the coast of Maine, nearly midway between Portland and Eastport, about one hundred and ten miles east of Portland and forty miles southeast of Bangor. It is a very popular summer resort and has wide notoriety.

The island has an area of about one hundred square miles, and is fourteen miles long and eight miles wide at the widest part. A chain of mountain peaks extends across it from southeast to northwest, these peaks being separated from one another by deep gorges and ravines, which at several points descend below the level of the sea.

The average elevation above the sea-level is almost 500 feet, and Green Mountain, the highest point, is 1,527 feet in height. The coast line is bold and rocky and much indented. "Somes Sound," a fiord of the sea seven miles long, runs up to nearly the centre of the island, cutting through the centre of the mountain range. The various indentations, or bays, furnish many good harbors, such as Bass Harbor, Southwest Harbor, Northeast Harbor, Seal Harbor, and Bar Harbor—the finest of all, lying upon the broad Frenchman's Bay.

The island is well wooded with pine, balsam, and spruce, although numerous fires have made sad havoc with the forests. Inland, in the valleys and high up among the mountains, are many beautiful lakes and ponds, the most extensive being Eagle Lake at the foot of Green Mountain, Echo Lake, Jordan's Pond, and Long Pond.

Lying about Mount Desert are numerous smaller islands which are attractive and picturesque, the principal of

which are the Porcupines at Bar Harbor, the Cranberry Islands, near Southwest Harbor, and Bear, Baker's, Duck, Greening's, and Sutton Islands. "The western sides of the mountain range slope gradually upward to the summits, but on the east they confront the ocean with a series of stupendous cliffs" ("Appleton's General Guide to the United States and Canada").

The island is of granite formation, exhibiting evidences of the great glacial movement; and the soil is dry and porous. On the northern side the mainland is separated from the island only by a narrow stream, and a bridge affords communication between the two. The scenery of the island is most attractive, varied, and grand, affording innumerable delightful excursions by land and by sea. Good roads and footpaths extend in every direction, and in the town of Eden alone there are one hundred and twenty miles of excellent road. The reader is referred to the various guide books for an enumeration and description of the many excursions and various points of interest. Mount Desert has become such a popular resort that every facility is afforded the visitor for enjoying and exploring its beauties. Local steamers run from one point to another of the island; hotels and boarding-houses of various prices abound; and the island can be easily and comfortably reached either by rail or by boat from Boston and Portland.

Bar Harbor is the most frequented and fashionable resort, and the cottage life has quite supplanted that of hotels and boarding-houses. Here beautiful and luxurious cottages abound, and in the season the social life resembles that of New York or Philadelphia in winter.

Every kind of outdoor and indoor diversion is afforded. There are many clubs and churches of various denominations. The Kebo Valley Club offers opportunities for golf on its attractive grounds, and sometimes during the summer the North Atlantic Squadron pays a visit to Bar Harbor, and during "Squadron Week" social gayety is at its height.

The water supply of Bar Harbor is taken from Eagle Lake, two hundred and forty feet above the village, and is abundant and pure. There is also an extensive and thorough system of sewerage. There are adequate protection against fire; many shops and good markets; excellent postal, telegraph, and telephone accommodations; two banks; a good police force; an intelligent and efficient board of health, and good medical service. The streets are lighted by electricity, which is also furnished to private residences.

Northeast Harbor and Seal Harbor are much frequented by "cottagers," and at the former is the attractive Episcopal Church founded by Bishop Doane of Albany. Southwest Harbor is beautifully situated at the entrance to Somes Sound, and is a favorite resort for those desiring a more quiet and simpler life. Indeed, almost any portion of the island has its special attractions for the summer resident, and one can visit the island year after year and always find some new portion to explore. "On the coast of America it (Mount Desert) has no rival, except, perhaps, at the bay of Rio Janeiro" (Appleton, *loc. cit.*).

Through the kindness of William Miller, Esq., of Bar Harbor, who made the observations, and the chief

weather forecaster at Boston who placed them at my disposal, the following compilation has been made of the climate of Mount Desert. In general it may be said that the summer climate is a cool, invigorating one, with a fair number of clear days and the average amount of rain for this latitude. Fogs are not infrequent and they sometimes last for several days or even a week.

There are no recorded observations of the humidity, but it cannot be very different from that of Eastport on the same coast, about eighty miles to the northeast. There the average relative humidity for July is 78.7 per cent.; August, 78.9 per cent., and for the year 76.3 per cent. The variations in temperature are considerable, and the air is apt to be chilly and damp. Such a climate would hardly be suitable for the delicate, for those who had a tendency to or were suffering from pulmonary or bronchial troubles, or from neuralgia. For any one who needs the influences of a bracing, cool, summer climate, or for a convalescent from any acute disease, who is well on the road to recovery, it can be recommended. It is also useful in some cases of neurasthenia and insomnia.

Some patients who are subject to hay fever find immunity on the island at one or the other harbors, especially at Northeast Harbor.

Edward O. Otis.

**MOUTH, DISEASES OF.** See THE APPENDIX.

**MUCOID DEGENERATION.** See *Degenerations, etc.*

**MUCOUS MEMBRANES: INFLAMMATIONS OF.**

The subject of inflammations of the mucous membranes is treated in this article in only a very general way. The specific inflammations (diphtheria, tuberculosis, syphilis, rhinoscleroma, gonorrhoea, erysipelas, influenza) will be discussed under their respective heads; the object of this article being to include only the simple non-specific forms of inflammation of these structures according to the definition of inflammation as given by Ziegler—namely, a tissue lesion accompanied by circulatory disturbances, an exudate, and tendency toward repair.

**ETIOLOGY.**—Although inflammations of different mucous membranes have somewhat different etiological factors, all have to a varying degree a common etiology.

The causes of inflammations of the mucous membranes are direct or indirect. Among the indirect causes are changes in temperature, gout, rheumatism, bad hygiene, decayed teeth, diseases of the circulatory, digestive, or respiratory systems, reflex influences, and idiosyncrasy.

The direct causes of inflammations are thermal, electrical, chemical, mechanical, neoplastic, and bacterial.

The application of hot or cold liquids and instruments to the mouth, pharynx, vagina, or urethra may cause a stomatitis, pharyngitis, colpitis, or urethritis. Breathing of hot air may cause a tracheitis or a bronchitis.

Electricity, applied by means of an electrical sound to the oesophagus or urethra, may cause an inflammation of the mucosa.

Certain chemicals, both organic and inorganic, produce inflammation when they come in contact with mucous membranes. The irritating substance may be mineral acids, alkalies or salts, gases, organic compounds, and

CLIMATE OF MOUNT DESERT ISLAND, MAINE, LATITUDE 44.38° N., LONGITUDE 68.36° W., FOR THE YEARS FROM 1896 TO 1901. OBSERVATIONS OF WILLIAM MILLER, ESQ., OF BAR HARBOR.

Data.	January.	April.	June.	July.	August.	September.	October.	Year.
Temperature (degrees Fahrenheit)—								
Average or normal	21.08°	42.4°	59.48°	65.9°	64.9°	58.6°	48.5°	39.4°
Average range	19.3	21.7	22.5	22.2	22.2	22.0	21.3	
Mean of warmest	30.7	53.6	71.1	77.2	76.3	70.1	59.3	
Mean of coldest	11.4	31.9	48.3	55.0	54.1	48.1	38.0	
Highest or maximum	49.0	72.8	86.3	90.5	89.0	87.6	73.5	
Lowest or minimum	-11.5	18.6	37.8	45.0	43.8	38.2	24.4	
Precipitation—Average in inches	5.60	3.14	2.85	3.86	3.28	3.77	4.62	
Wind—Prevailing direction	N. W.	E.	S. W.	S. W.	S. W.	S. W.	S. W.	S. W.
Weather—								
Average number of clear days	11.2	15.1	16.5	18.3	17.6	15.3	14.3	
Average number of partly cloudy days	8.2	6.3	7.5	6.0	6.5	7.8	8.3	
Average number of clear and partly cloudy	19.4	21.4	24.0	24.3	24.1	23.1	22.6	

bacterial toxins. Nitric, sulphuric, or hydrochloric acid, sodium or potassium hydroxide, and nitrate of silver will cause a stomatitis, rhinitis, or pharyngitis, and, if the irritants are swallowed, an œsophagitis and gastritis may follow. Gases (hydrogen sulphide, ammonium sulphide, chlorine) cause an inflammation of the respiratory tract or the pharynx. The organic compounds and the toxins produce marked effects on the digestive tract. These poisons are taken into the body as such or they result from decomposition of food or are germ excretions. If the irritation produced by these substances is marked, a gastritis or an enteritis will follow.

The mechanical agents which cause inflammation are foreign bodies. Poorly fitting pessaries may cause colpitis, an improper plate in the mouth a stomatitis, or masturbation may cause a urethritis. Trauma of any sort is a direct etiological cause of many non-purulent inflammations of mucous membranes, and is the avenue of entrance of germs, so that it is a predisposing factor of many purulent inflammatory conditions. Of the foreign bodies, dusts of certain trades (mining, marble cutting, painting, milling) cause a chronic inflammation of the respiratory tract. The introduction of foreign bodies into the vagina, uterus, bladder, or nose will produce similar conditions unless they are removed.

Bacteria are the most important etiological agents of inflammation. The germs may be saprophytic or pathogenic, causing inflammation by decomposition, or becoming virulent and pathogenic. The pathogenic bacteria produce inflammation by means of their toxins which act as irritants.

**CLASSIFICATIONS OF INFLAMMATIONS OF MUCOUS MEMBRANES.**—The factors which enter into inflammatory phenomena are the tissue lesion, circulatory disturbance, the exudate, and the tendency toward repair. Based upon this the following classification of inflammations of mucous membranes is offered.

Inflammations of Mucous Membranes.	Acute.	Catarrhal.
		Muco-purulent.
Chronic.	Fibrino-purulent.	Purulent.
		Fibrinous.
		Hemorrhagic.
		Gangrenous.
		Atrophic.

According to the amount of the reaction on the part of the connective-tissue elements, the general division of inflammations into acute and chronic is made. The term acute is applied to those inflammations in which the fixed connective-tissue cells have not begun to show a reactive change other than the sudden defence needed to protect themselves from the injurious agents. No fibroblasts or angioblasts are seen in sections of such inflammatory processes.

According to the lesion and exudate which they show the acute inflammations of mucous membranes may be divided into catarrhal, muco-purulent, purulent, fibrino-purulent, fibrinous, hemorrhagic, and gangrenous.

Sooner or later, if the irritation causing the inflammation continues, the fixed connective-tissue cells, especially the endothelium, show a reactive change, and form a fibroblastic connective tissue, which later becomes firm scar tissue.

Chronic inflammations of mucous membranes are divided into *hypertrophic* and *atrophic*, depending upon the changes in the mucosa themselves. Chronic hypertrophic inflammations are characterized by hypertrophy of the epithelial elements of the mucosa such as occurs in chronic hypertrophic rhinitis or in chronic endometri-

tis. In chronic atrophic inflammations, on the other hand, the glands and epithelial lining cells undergo atrophy such as occurs in chronic atrophic gastritis.

**Acute Catarrhal Inflammation.**—Any mucous mem-

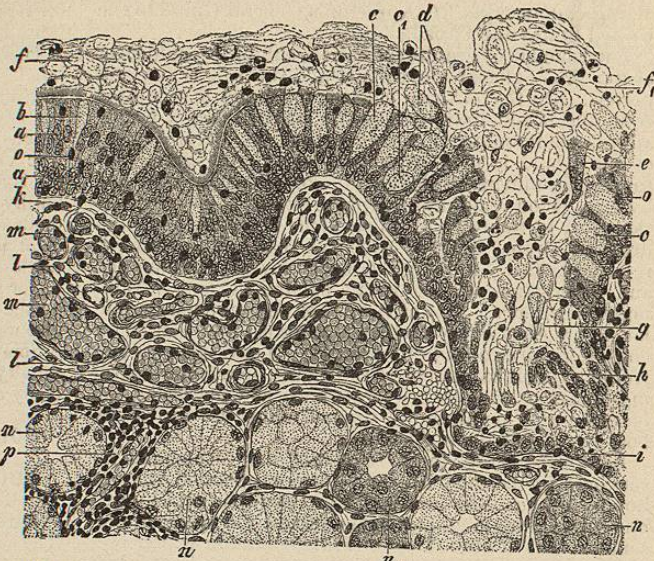


FIG. 3376.—Acute Catarrhal Bronchitis. a, Ciliated cells; a<sub>1</sub>, deep cell layers; b, goblet cells; c, markedly mucoid cells; c<sub>1</sub>, mucoid cells with mucoid nucleus; d, desquamated mucoid cells; e, desquamated ciliated cells; f, layers of drops of mucus; f<sub>1</sub>, layer of stringy mucus and pus corpuscles; g, excretory duct of a mucous gland filled with mucus and cells; h, desquamated epithelium of the excretory duct; i, intact epithelium of the mucosa, partly infiltrated with cells; m, dilated blood-vessel; n, mucous gland filled with mucus; n<sub>1</sub>, lobule of mucous gland without mucus; o, migrating cells in the epithelium; p, cellular infiltration of the connective tissue of the mucous glands. (Ziegler.)

brane (mouth, nose, pharynx, larynx, etc.) may be the seat of a catarrhal inflammation. On macroscopical examination, the surface of the mucous membrane presents a shiny, glistening coating due to a thick, stringy, more or less homogeneous exudate. Sections of these mucous membranes show that their epithelial cells are swollen and the cell protoplasm is replaced by a finely granular or slightly stringy homogeneous substance (mucin), which stains deeply with Delafield's hæmatoxylin. The nuclei of these cells are pushed to one side or toward the base of the cell and stain faintly with nuclear stains. The epithelial cells lining the glands show a similar change. The submucosa is œdematous and may show an infiltration of leucocytes and few red blood cells. The œdema and the leucocyte exudate may extend into the muscular layers.

**Acute Muco-Purulent Inflammation.**—Change of temperature, some irritating dusts or gases will produce in mucous membranes, especially of the respiratory tract, an inflammation characterized by a light yellow, semi-transparent, slightly stringy fluid exudate which is tenacious and adheres to the mucous membrane. The mucosa is swollen and the vessels are injected. Microscopically the picture presented is the same as that in a catarrhal inflammation, with the exception that a more marked leucocyte infiltration exists in all the layers and the exudate contains more leucocytes than does that of the catarrhal form.

**Acute Purulent Inflammation.**—Bacteria are the most frequent causes of this form of inflammation of a mucous membrane, but certain foreign bodies and drugs will produce identical phenomena. Foreign bodies in the nose, œsophagus, or bladder will cause a purulent rhinitis, œsophagitis, or cystitis. Turpentine or phenol in the mouth will produce a similar condition, and bacteria will cause a purulent inflammation of any mucous membrane. Macroscopically, the mucous membranes affected with acute purulent inflammation are reddened and swollen

and their surfaces are covered with a thick yellowish or greenish-yellow, semifluid, opaque exudate. Microscopically, the epithelial cells lining the mucosa show a simple coagulation or liquefaction necrosis. The exudate is composed of cell debris, desquamated epithelial cells, and necrosing leucocytes. The connective tissue of the mucosa and submucosa, and often of the muscular layer, shows a marked leucocyte infiltration which may contain a varying number of red blood cells, and the vessels are congested and the connective-tissue fibres are swollen, due to œdema.

**Acute Fibrino-Purulent Inflammation.**—The same agents which cause a purulent inflammation may cause a fibrino-purulent condition, depending upon the lesion produced. Cystitis which follows sounding of the bladder or results from an enlarged prostate or from calculi is very frequently a fibrino-purulent inflammation; and a foreign body in the vagina or rectum may cause a similar condition. The mucous membrane is covered by a yellowish-gray or greenish, tenacious exudate which adheres to the surface and when it is pulled off leaves a reddened surface. The mucosa is thickened and reddened, and the submucosa and muscular coats are œdematous and congested. Sections of the organ affected with fibrino-purulent inflammation show an exudate made up of a varying amount of stringy, granular, or hyaline fibrin, which forms a network enclosing desquamated epithelial cells and collections of necrosed or necrosing leucocytes. The epithelial cells of the mucosa are desquamated and show fatty degeneration, cloudy swelling, or necrosis. In the subepithelial connective tissue of the mucosa and in the submucosa are masses of leucocytes which may be degenerating and which are surrounded by œdematous connective-tissue fibres.

**Acute Fibrinous Inflammation.**—The ordinary pus germs in the rectum, vagina, mouth, pharynx, or nose may produce an acute fibrinous inflammation. Fraenkel's pneumococcus and Friedländer's pneumobacillus will produce on the tonsils and in the pharynx, larynx, and nose a similar condition; furthermore, this form of inflammation is the cause of death in cystitis due to enlargement of the prostate or to calculi, and fibrinous proctitis or enteritis may follow prolonged rectal feeding in cachectic individuals. The difference between this form of inflammation and fibrino-purulent inflammation is shown in the character of the membranous exudate. In the

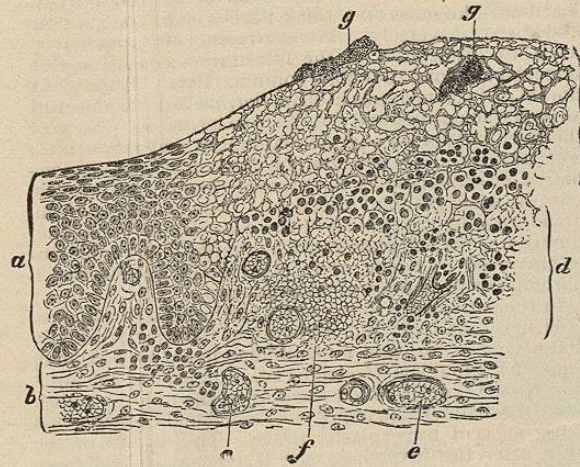


FIG. 3377.—Acute Fibrinous Inflammation of the Uvula. a, Normal epithelium; b, connective tissue of the mucous membrane; c, reticulated fibrin; d, connective tissue of the mucosa infiltrated with fibrin and round cells, and partly necrotic; e, blood-vessels; f, hemorrhage; g, masses of micrococci. (Ziegler.)

former the color of the membrane is pearly white or light yellow streaked with red, and the membrane itself is spongy and adherent to the surface, and when it is forcibly removed it leaves a reddened surface, usually dif-

fering from the diphtheritic membrane due to the Klebs-Loeffer bacillus in the fact that the latter can be withdrawn only with great difficulty and leaves a depressed surface which looks like an ulcer. Microscopically, the mucous membrane which is the seat of an acute fibrinous inflammation is covered with an exudate composed of granular, stringy, or hyaline fibrin, which forms a firm network enclosing few leucocytes, red blood cells, and desquamated epithelium. The epithelial cells lining the mucosa show a simple or coagulation necrosis, and

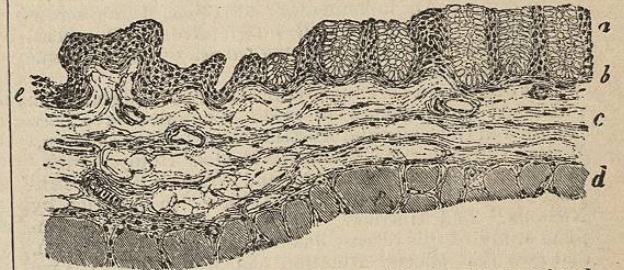


FIG. 3378.—Chronic Atrophic Enteritis. a, Glandular layer reduced to one-half its height; b, muscularis mucosa; c, submucosa; d, muscularis; e, mucous membrane entirely atrophied. (Ziegler.)

The nuclei do not stain; fine threads of fibrin separate the epithelial cells and extend deep into the submucosa; leucocytes and red blood cells are scattered throughout the mucosa and submucosa and to a slight extent in the muscular layers, and the connective tissue of all the layers is markedly œdematous.

**Acute Hemorrhagic Inflammation.**—The poisons produced by putrefaction outside of, and taken into, the body, cause a hemorrhagic gastritis and enteritis. Turpentine and croton oil in large doses produce a similar condition. The mucosa vary in color from dark red to brown and are greatly swollen, and the contents of the stomach and intestine are streaked with fresh and decomposed blood. Microscopically, the epithelial cells lining the lumina show cloudy swelling, fatty degeneration, simple necrosis or coagulation necrosis; the spaces between the epithelial cells are occupied by œdema and red blood cells, the connective tissue of the mucosa and submucosa shows a varying number of red blood cells scattered or collected in small masses, and all the blood-vessels are greatly congested.

**Acute Gangrenous Inflammation.**—The bronchi frequently become the seat of this form of inflammation; in some of the cases the disease having originated by the penetration of an ulcer from an œsophageal diverticulum into the bronchi, while in others it represents a simple extension of a gangrenous process in the lung. The presence of foreign bodies in the nose, œsophagus, or vagina, or the occlusion of the nutritive vessel of any mucous membrane, or a simple trauma may eventuate in an acute gangrenous inflammation. The condition is accompanied by foul odors, caused by hydrogen sulphide, ammonium sulphide, etc. The mucosa in the early stages resembles that of acute purulent inflammation, with the exception that the pathological changes are more marked. In the later stages the mucosa may slough away and the necrosis may be so extensive that the deeper layers are involved.

**Chronic Hypertrophic Inflammation.**—This form of inflammation is most often found in the uterus, but hypertrophic rhinitis is common. The mucous membrane is thickened and varies in color from gray to gray-pink; the glands of the affected mucous membrane become hypertrophic and some become cystic; and, finally, the connective tissue of the mucosa becomes increased in bulk.

**Chronic Atrophic Inflammation.**—The prolonged use of alcohol will cause this condition in the stomach, and caries of some part of the bony framework of the nose or the mere presence of a foreign body somewhere in the nasal cavities is competent to produce chronic atrophic rhinitis. The mucosa are thin and in the stomach the outer layers become atrophic; the glands of all surfaces

affected show marked atrophy and their epithelial cells show mucous degeneration; and the connective tissue of the mucosa and submucosa is greatly increased and may cause constriction of the lumina of some glands. In the latter event these glands become cystic, and the muscular coats undergo marked atrophy.

Frederick A. Baldwin.

MULLEIN. See *Scrophulariaceae*.

**MULTIPLE PROGRESSIVE HYALOSEROSITIS.**—**DEFINITION.**—An inflammatory affection of the serous membranes, of chronic and progressive development, characterized by a peculiar overgrowth of fibrous tissue with hyaline metamorphosis.

This disease is a very remarkable one, and, judging from published cases, somewhat rare. Examples have been recorded in Germany and Austria chiefly by Hamboursin,<sup>1</sup> Weiss,<sup>2</sup> Curschmann,<sup>3</sup> Vierordt,<sup>4</sup> Riedel,<sup>5</sup> Rumpf,<sup>7</sup> Pick,<sup>8</sup> Schupfer,<sup>9</sup> Siegert,<sup>10</sup> Schmaltz and Weber,<sup>11</sup> Rose,<sup>12</sup> Strajesko;<sup>14</sup> in England by Hale White<sup>5</sup>; in America by Nicholls<sup>13</sup> and Herrick.<sup>16</sup> It is only lately that a complete study of this disease has been attempted (Nicholls), and now that special attention has been called to it we may expect in the near future to have many more cases recorded, for the disease is probably not so rare as has been thought.

The affection may begin in various ways, so that differing clinical types are produced. Sometimes the capsule of the liver is chiefly affected, and it is to this class of cases that the terms "diffuse chronic hyperplastic perihepatitis," "chronic deforming perihepatitis," "Zuckergussleber," have been applied. In other cases it is the pericardium or the pleura that is first involved. Nevertheless, in whatsoever way the disease may begin, or in whatever part it may attain its greatest intensity, it is to be noted that the process is everywhere essentially the same, since it becomes diffuse and involves one serous membrane after another in a steady progression. Consequently the term *multiple progressive hyaloseritis*, denoting as it does an inflammatory process at once chronic and continuous, and emphasizing the peculiar hyaline change which is so striking an element in the anatomical picture, is perhaps the most suitable term to employ.

**DISTRIBUTION.**—The disease appears to be widely disseminated, being found in all countries and all climes; sex appears to have but little importance; the cases hitherto recorded have been chiefly in males. With regard

to age, the youngest patient affected was aged four, the oldest eighty years; those below middle age are probably the most likely to be affected.

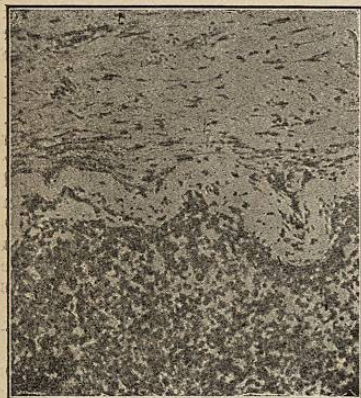


FIG. 3379.—Section of Liver, Showing well the Glisson's Capsule Thrown into Folds, with the Deposit of Hyaline Fibrous Tissue upon the Surface. (Nicholls.) (Winckel objective No. 5, without eyepiece.)

the serosae of a pearly white material having a dense, cartilaginous consistency. This substance has been compared to the sugar upon a cake (*Zuckerguss*) and to

porcelain. When forming a definite membrane it varies in thickness from a few millimetres to from 1 to 5 mm., and can be readily stripped off the subjacent organs without injury to their substance. On section the membrane has a semitranslucent, almost glistly appearance.

In the sporadic form the material usually forms flattened plaques, but may occur in elevated or even polypoid nodules. The favorite sites of localization are the capsules of the spleen and liver, the diaphragm, and the pleurae. When affecting, as the process usually does, more than one serous sac, no order of involvement is absolute, but combinations are numerous.

With regard to the diffuse form, in the majority of cases the capsules of the liver and spleen, the pericardium and the lower portions of the pleurae are involved. It is the rule also for more or less implication of the general peritoneum to occur. This results in induration and contraction of the great omentum and the mesentery; the omentum is frequently converted into an irregular tumor-like mass or a thick fibrous cord crossing the abdomen transversely. The contraction of the mesentery leads to dislocation of the intestines so that they lie bunched up along the spinal column. Bands of adhesions, fibroid and velamentous in character, are found connecting adjacent structures and are likely to be met with between the liver and spleen and the diaphragm and between the coils of intestines. While all or most of the serous membranes are involved in the process, they do not all present the same grade of affection. Thus, while one membrane presents the typical "icing" appearance, the other serous sacs may be obliterated by simple fibroid adhesions or traversed by bands, or in other cases may contain a fibrinous or fibrino-purulent exudation.

In the perihepatic form, where the brunt of the disease falls upon the liver and diaphragm, the liver is usually diminished in size and much altered in shape, becoming somewhat globular; the edges are rounded and the anterior border is often rolled back upon the upper surface. The gall-bladder is usually contracted and enclosed in a dense mass of hyperplastic tissue. The surface of the liver, after the investing crust is removed, which may readily be done, is smooth or at most slightly uneven. On section the organ usually shows brown atrophy, fatty degeneration, with some passive congestion. Cirrhosis of the organ does not occur as a rule; at most there is a slight thickening of the septa passing in from the capsule. The spleen is often enlarged, generally covered with the "icing" membrane, and deformed. With regard to the pleurae, the right is as a rule more seriously involved than the left; the bases of the sacs are the sites of election

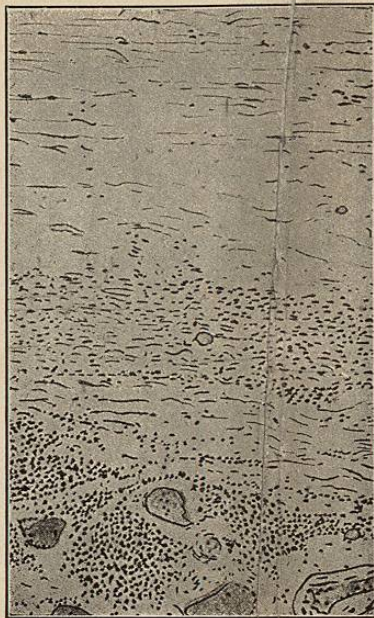


FIG. 3380.—Section of Peritoneal Membrane in the "Zuckerguss" condition Showing Perivascular Leucocytosis and Hyaline Degeneration of the Superficial Fibrous Tissue. (Nicholls.) (Camera lucida drawing; Reichert objective No. 3.)

for the process. The lungs are usually atrophied and partially collapsed. Chronic adhesive pericarditis, or, more correctly, mediastino-pericarditis, is frequently found. More rarely an acute exudative pericarditis is present, and more rarely still the pericardium may be normal. Occasionally the pericardial sac is only partially obliterated, and then the adhesions are denser on the right side toward the diaphragmatic surface. Calcareous deposits are sometimes met with in the adhesions. The heart is often small and may show the results of pericardial adhesion, namely, dilatation and insufficiency of the valves.

The kidneys in most instances show no special abnormality except possibly congestion. In a few cases interstitial fibrosis has been found. The digestive tract shows but little disturbance; the stomach and colon may be found adherent to adjacent parts. A duodenal ulcer was found in one case. Icterus is never present, unless the case is complicated by cirrhosis of the liver or by obstruction to the common bile duct. As complicating conditions which hasten the fatal termination, acute pneumonia, pericarditis, pleurisy, peritonitis, and osteomalacia may be mentioned. A striking feature of the diffuse form is ascites, which is usually extreme. The ascitic fluid is of pale straw color, high specific gravity, containing flakes of fibrin, and has all the appearances of an inflammatory exudate. Anasarca is usually not marked until toward the end.

In addition to the form just described it should be stated that an increasing number of cases of serositis of this hyperplastic type are being reported as due to tuberculosis. It is beginning to be recognized that tuberculosis is not necessarily destructive, but, on the contrary, may be constructive;—instead of extensive caseation and softening we may have the formation of a hyperplastic hyaline membrane with little or no caseation. In many cases it is only the discovery of the specific bacillus which will reveal the true nature of the process. It used to be thought that cases of the perihepatic or "Zuckergussleber" type, to which Curschmann first drew attention in his classical paper, were never due to tuberculosis; but this is certainly incorrect. Recently Strajesko (*loc. cit.*) and James B. Herrick (*loc. cit.*) have recorded typical cases undoubtedly of tuberculous origin.

Hyperplastic tuberculosis of the serous membranes is in my experience not very uncommon, but it is certainly rare for it to attack the capsule of the liver, the pericardium, and the right pleura in such a way as to simulate Curschmann's "icing" liver and atrophic cirrhosis. The lesions produced are not unlike those of the simple or non-tuberculous form, the main difference being that the process is not so liable to be concentrated on any special organ, but is more generalized over the serosae. Again, ascites is usually less marked and fibroid adhesions are more numerous. The membrane produced is rarely smooth and glistening, but is covered with fibrin and shaggy adhesions. A hypertrophic fibro-hyaline membrane may be produced also in this form, but in it caseous masses can generally be made out, disclosing the etiology of the case; the caseation may, however, be very trifling.

Microscopically the membrane in the simple form is composed of parallel laminae of connective tissue showing marked hyaline thickening of the fibrillae. In the deeper portions newly formed capillaries can be made out with some perivascular leucocytosis, and "Mastzellen" are numerous. Macroscopically the membrane has all the appearance of an organizing deposit upon the serosae.—a deposit in which hyaline degeneration constitutes the most striking feature. In the

tuberculous form the connective-tissue fibrillae interlace freely, and there are usually multiple areas of caseation with numerous giant cells. Hyaline degeneration is also present, but is rarely so marked as in the simple form. Tubercle bacilli can usually be demonstrated readily on making smears from the deposit.

In the tuberculous form, unlike the first variety, the liver is usually enlarged and often shows signs of miliary tuberculosis with slight interstitial fibrosis. Old tuberculous foci are usually found in the lungs, pleura, and peribronchial glands. The case often terminates with a generalized miliary infection.

**ETIOLOGY AND PATHOGENESIS.**—Two views have been advanced as to the causation of the disease. The first is that of Pick, who regards the primary condition as an adhesive pericarditis which leads to portal obstruction and the so-called "cardiac" cirrhosis of the liver, eventually resulting in ascites and thickening of the liver capsule. The objections to Pick's view briefly are, that cases occur in which pericardial adhesion is absent, and in most of the recorded cases it has been shown that portal stasis was not present; nor, again, does the development of the physical signs accord with what should occur were Pick's view correct. It must be said that all those who have carefully studied the question are agreed that the overgrowth of fibrous tissue and the ascites are due to an inflammatory process involving the various serosae. Most cases give a history of some previous acute inflammatory disease, and the development of the lesions can usually be traced from one serous membrane to another. Cases have been known to follow acute rheumatism, typhoid fever, whooping-cough, measles, malaria, and perityphlitis. The transmission of the infective agents from one serous sac to another takes place by means of the lymphatics. In the tuberculous form, which is anatomically strictly comparable to the simple type, the true nature of the disease is of course obvious. With regard to the ultimate nature of the process in the simple form, some little doubt must still exist; but it is probable that micro-organisms of low virulence are at work.

The inflammatory process usually begins in the peritoneal cavity in the form of a hepatitis or perihepatitis, or, more rarely, about the stomach and duodenum; it extends to the right pleura and eventually to the pericardium. Next in frequency, the primary lesion is a chronic pericarditis with adhesion extending to the right pleura and thence to the peritoneum; more rarely still, chronic pleurisy may extend to the liver capsule. The process is accompanied by an exudation of sero-fibrinous fluid into the abdominal cavity, which fluid tends to be

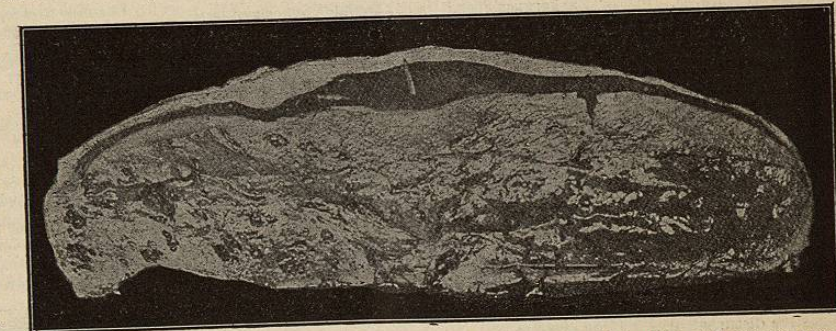


FIG. 3381.—Tuberculous Perihepatitis. The illustration shows the thick hyaline and caseous membrane produced in the chronic hyperplastic type. (Nicholls.)

abundant owing to the involvement of the absorptive surface of the peritoneum by the dense fibrous deposit, and also from the fact that the contracting fibrous masses sometimes lead to pressure upon the inferior vena cava and portal vein, thus promoting ascites. The liver gradually diminishes in size, and the spleen becomes enlarged in the later stages when passive congestion be-