

great; for instance, in August, between seven and ten o'clock, the mercury rises from 44.6° to 53.6° F.; and again at sunset it falls as rapidly as in the morning it rose. Secondly, the great radiant heat of the sun is another characteristic; for instance, the maximum sun temperature in the upper Engadine on February 4th, 1876, was 118° F.

The number of hours of possible sunshine in winter is somewhat greater in the Engadine than at Davos; for example, on January 1st, the sun rises at Maloja at 9:35 and sets at 3:45, while at Davos it rises at 10:03 and sets at 3.

The average rainfall, most of it being snow, is 32.67 inches; it lies on the ground for over five months, beginning about November 14th. The relative humidity is 75 per cent. The mean annual temperature is about 36.5° F., and for the seasons as follows: Winter, 18.1° F.; spring, 33.7° F.; summer, 50.9° F.; autumn, 36.5° F. There is said to be rather more cloudiness in the Upper Engadine than at Davos. As at Davos, the purity and exhilarating quality of the air in this region constitute, in brief, the great striking characteristic which all experience who enter this valley. The writer can never forget his own sensations as he came over the pass from Chiavenna into this delicious atmosphere. Merely to exist was a delight, and to spend the day in tramping over a glacier or mountain climbing was exquisite pleasure, and after such exertions no sign of weariness was experienced.

A considerable number of consumptives take the winter cure here, and there are excellent accommodations at Samaden, St. Moritz, and Maloja; at the latter is the large Kurhaus, accommodating five hundred guests and especially arranged for a winter residence; the ventilation and sanitary arrangements are of the best. In the village of St. Moritz is the great caravansary "Engadiner Kulm," with a wonderful view over the whole district of St. Moritz. Here one can find every comfort, and even luxury,—large reception-rooms, a library, a dining-room for three hundred and fifty persons, and a fine collection of engravings and pictures. The English and Americans chiefly patronize this hotel. St. Moritz is the highest village in the Engadine or in Switzerland, having an elevation of 6,085 feet.

A mile or two from St. Moritz village are the St. Moritz baths. These are supplied from two acidulous iron springs,—the old and the new, containing soda with a large proportion of fixed solids and free carbonic acid. These waters are used both for drinking and for baths and are visited in the season—from the middle of June to the middle of September—by numerous patients of all nations. The conditions benefited by these waters are anæmia, chlorosis, dyspepsia, menstrual irregularities, various derangements of the nervous system, etc. There is a large Kurhaus with many rooms, two bath houses containing eighty baths, and complete hydrotherapeutic arrangements (warm, cold and Scotch douches, sitz baths, vapor baths, etc.), as well as facilities for massage. There is a covered promenade leading from the Kurhaus to the spacious pump room of the new spring. There are generally about three hundred and eighty patients in the Kurhaus, and every attention is given to their comfort and diversion.

What has been said regarding the winter climate of Davos in the treatment of pulmonary tuberculosis applies equally to that of the Engadine; there is no material difference between the "air cure" of the Davos and that of the Engadine valley, and the results should closely resemble each other. In the winter resorts of the Upper Engadine there is greater variety of scenery and the life is more restful and quieter.

Regarding the uses of such a climate as that of the Upper Engadine for cases other than tuberculosis, a few words can properly be said here, applicable also, in a measure, to all high-altitude resorts. Whatever the malady or condition there should exist a "certain integrity and reactionary power of the constitution," if the patient is to be benefited by a climate which is stimulating and bracing, such as this. This being presupposed, we can

say, in general, that where functional activity needs to be improved, and the whole system toned up, a few weeks' residence in this pure, clear, dry, bracing air will almost surely produce favorable results. "I believe," says Burney Yeo, "this kind of climate is especially useful to those who have been *strong*, but by some accident or other, such as overwork, or illness, or trouble, have become weak; to those who possess a latent power of reaction." To enumerate especial conditions, there may be mentioned, nervous dyspepsia, want of appetite, sleeplessness, malaria, neuralgia, anæmia, the later stages of convalescence from severe illness, hypochondriasis, asthma uncomplicated with emphysema or organic disease of the heart or arteries, chronic bronchitis with much secretion, and those various mal-conditions arising from "insufficient exercise in the open air and deficient absorption of oxygen."

Burney Yeo happily expresses it when he says that much of the benefit that is derived from a short residence in an elevated region like that of the Upper Engadine is due to the alterative influence which it exercises on the human organism. "In passing," he continues, "from the sea-level to an elevation of over 6,000 feet we must alter in a very essential manner the conditions of our lives."

It is well also to bear in mind some of the contra-indications of a mountain climate like this. Such are, weakness from extremes in age; constitutional weakness; organic cardiac disease; atheroma; chronic bronchitis with dilated bronchi; and emphysema, muscular debility and general exhaustion, rheumatism and inability to endure great and sudden changes of temperature.

Finally, if we are not in search of health or better health, we all need change occasionally,—"that change which is the type of life and the condition of health; that change which is rest." Where can a more complete or a more refreshing change be found than among the grand glaciers and majestic mountain peaks of the Upper Engadine, where we can "draw in easier breath from larger air." *Edward O. Otis.*

ENTERITIS.—An inflammation of the small intestine, involving particularly the mucous membrane, and to a less extent the submucous layer. It may be either acute or chronic. The whole length of the intestine may be involved or, more usually, the inflammation is limited to certain portions of this.

The meaning of the term *enteritis* has varied considerably as used by different authors, and at different periods in medical literature. It does not appear to have been in use by the ancients. In the eighteenth century it was applied to the group of symptoms now included under peritonitis, although Cullen (1784) mentions two varieties of the disease, one of which evidently refers to an inflammation of the mucous membrane and subjacent tissues of the intestine. In France, at about the end of the eighteenth century, Pinel limited the use of the word to an inflammation of the intestinal mucous membrane. Its meaning was further restricted during the first half of the nineteenth century by Broussais (1821), who applied it to an inflammation of the mucous membrane of the small intestine only, and gave the name *colitis* to a similar process in the colon. This restricted meaning has been more or less generally retained up to the present time.

At the beginning of the last century the lesions of the intestinal lymphoid structures found in typhoid fever were included under the general term *enteritis*, and this use of the term was continued to some extent even after the specific nature of the lesions had been demonstrated. At present the term is avoided by some authors, "intestinal catarrh" being used instead as indicating the character of the most frequent form of inflammation of both the large and the small intestines. While it is recognized that the same etiological factors may produce similar changes in either the large or the small bowel, that usually each is involved to a greater or less extent in both the acute and the chronic catarrhs of the intestine, and

that at times it is difficult to determine the exact parts involved, yet, as the symptoms referable to the one or other part of the intestine vary to some extent, and as the treatment must necessarily differ accordingly, it may be wise to use the term *enteritis*, as will be done in this article, as applying to the small intestine, the term *colitis* being used for the affection of the colon, and *ileo-colitis* for the combined involvement of the two.

The summer diarrhoeas of children will not be discussed here, nor will the specific infections of the intestine.

As the catarrhal variety of enteritis is by far the most common, and for this reason the most important, both the acute and the chronic forms of this will be discussed at some length.

CATARRHAL ENTERITIS.

Catarrhal, as here used, has the common meaning of the term, that is, as indicating an inflammation of a mucous membrane characterized by a free exudation from the surface, usually rich in mucus. During life such an inflammation is evidenced by the presence of the inflammatory exudate which is discharged from the body, as well as by various other symptoms which are explained by the process.

ETIOLOGY.—*Acute Catarrhal Enteritis.*—The causes of this are most numerous. They may act as predisposing to, or direct excitants of, the inflammatory process. The dividing line between these two classes is frequently difficult to determine. The disease of the intestine may occur alone, or it may accompany or result from various other disorders. It is to be noticed that because of its position and the length of its canal, the small intestine is particularly liable to be affected by any kind of irritating substances which are ingested, unless these are rendered harmless in the stomach, as well as by certain excretory products which pass through its wall; and of prime importance among the predisposing factors is the ease and frequency with which an abnormal condition of the blood supply of the intestinal wall occurs, in part due to some obstruction to the returning blood in the portal system, and in part to the lack of sufficient support for the blood-vessel walls by the surrounding tissue.

An unsuitable dietary is probably the most frequent direct cause of intestinal derangement. This may be at fault only in quantity, or in quality, or in both. Food which is entirely wholesome may, when eaten in too great quantities and only partially masticated, excite a diarrhoea, as may also unripe fruit, uncooked vegetables, etc. This may be only an evidence of increased peristalsis, but often it results from a true catarrhal inflammation of the intestine. The undigested food here acts either as a mechanical irritant, or it furnishes favorable conditions for abnormal bacterial development in the intestinal canal. This microbial growth, in which the common inhabitants of the intestine chiefly take part, gives rise to a variety of active irritants. These in large part are only excessive quantities of substances normally present, chiefly acids, such as lactic, butyric, acetic, and formic, together with different kinds of gases. But besides these, substances of a more decidedly toxic nature may be formed here, probably closely resembling those referred to in the next group. This group embraces those foods which, before being eaten, have already undergone bacterial decomposition and contain poisonous products resulting from this. Such are tainted meat and fish, at times milk and its various products, etc. The active toxic agents in several of these are already known. Among them may be mentioned Vaughn's tyrotoxin, Firth's lactotoxin, and the various ptomaines which Brieger has isolated. At times the inflammation can be explained as due to some idiosyncrasy. Thus lobsters, cheese, eggs, etc., when entirely wholesome and in moderate quantities, may in certain individuals give rise to an acute enteritis. Foul water also frequently produces a similar disturbance.

Among the active poisons whose entrance into the ali-

mentary canal is followed by severe inflammatory processes are included arsenic, corrosive sublimate, antimony, the mineral acids and caustic alkalis, and many others. The drastic purgatives, as croton oil, colocynth, elaterium, etc., in unsuitable doses may produce enteritis.

Exposure to cold, particularly a sudden chilling of the body after over-heating, is a recognized cause of the disease. In what way this acts, whether reflexly through the nervous system, as seems probable, or otherwise, is a question; but some disturbance of the intestinal function is produced sufficient to excite an inflammatory process. Cold drinks, ice, ice-cream, etc., when taken in immoderate amounts may have a similar result.

Excessive summer heat is also a common cause of catarrhal enteritis, particularly in young children; hence the popular term "summer complaint" so frequently applied to this. Its action is largely an indirect one, furnishing favorable conditions for bacterial growth in food before its consumption. Extensive burns of the skin may give rise to an inflammation and ulceration of the duodenum. The actual exciting agent here is probably a toxic substance which is formed at the site of the burn, and is excreted into the upper portion of the intestine.

The rôle of bacteria in producing decomposition products in various articles of food has already been referred to. No specific micro-organism can be accepted as the usual cause of enteritis, although the common colon bacillus is undoubtedly a frequent factor, due to conditions which favor its rapid development and increased virulence in the intestinal canal. Gärtner has cultivated and described a bacillus which was obtained from the flesh of a cow having an intestinal disease, and also from the spleen of a man who had been poisoned by eating some of this meat. Cultures of this produced a marked enteritis in susceptible animals. To this organism was given the name *Bacillus enteritidis*. Gaffky has likewise found in the stools of a cow having a bloody diarrhoea, and in those of patients who were made sick by the milk from this cow, a small highly virulent bacillus. Each of these, however, closely resembles the *Bacillus coli communis*, and they are probably members of the so-called colon group.

Traumatic causes, such as blows on the abdomen, may give rise to intestinal inflammation. Gall stones may mechanically produce this, as can also the presence of certain intestinal worms.

Among the more important predisposing causes is age. Young children show but slight resistance to intestinal irritants, so that even cow's milk may be sufficient to produce a catarrhal enteritis in an infant. Old and debilitated persons have an increased intestinal susceptibility, and chronic congestion of the intestinal wall predisposes to the disease. Previous attacks of inflammation usually render the mucous membrane very susceptible for a time to slight irritation.

A catarrhal enteritis accompanies numerous other diseases of the intestines, as tumors, invagination, peritonitis, etc., and also occurs in many of the acute infectious diseases.

The causes of *Chronic Intestinal Catarrh* are largely those of the acute form of the disease. A severe acute attack of enteritis, when prolonged because of unfavorable conditions for recovery, may gradually pass into the chronic type. Or the repeated action of slight irritants, as indigestible food, alcohol, purgatives frequently employed, intestinal parasites, etc., may give rise to this condition. Here the process is at times evidenced by several acute attacks, or the symptoms of chronic enteritis constitute the first appearance of the disease. Anything which interferes with the normal circulation of the blood or lymph in the vessels of the intestinal wall tends to render it susceptible to inflammatory excitants. Thus cirrhosis of the liver, and chronic diseases of the lungs and heart, which give rise to a continuous overdistention of the venous system, are very frequently associated with a chronic enteritis. Continual excretion of toxic substances through the intestinal wall, as occurs in chronic nephritis, and probably also in tuberculosis, malaria, and

