

the tumor. Soft carcinoma and sarcoma do not present this peculiarity; hence its importance from a diagnostic view. A discharge from the nipple would indicate implication of the ducts; it is a rare symptom and has no clinical significance. In adeno-carcinoma a serous discharge from the nipple is common. From the preceding it would be expected that a certain fixation of the nipple, the impossibility of drawing it forward, would be present before retraction took place; this is so, and constitutes a valuable diagnostic sign early in the life of carcinoma (scirrhus). Besides adhesion and dimpling, infection of the skin may be recognized by the appearance of small, firm infiltrations, without elevation of surface or discoloration, in the neighborhood of the original growth. These indurations, which are first recognized by the touch, become harder, elevated, discolored, livid, and then ulcerate; in atrophic carcinoma they may even cicatrize. Their presence is indicative of an extremely large infected territory around the primary growth.

I have never seen good results follow operations upon such growths; the resulting wound does not cicatrize, and the skin edges rapidly become infiltrated with new growth. Much importance has been attributed to the presence of large veins in the skin of a breast as indicating a certain kind of tumor; I cannot admit that this is quite the fact, except in the general way that it is usual to find large vascular channels in the vicinity of a rapidly growing neoplasm. In atrophic carcinoma enlarged veins are very rarely seen, for here the circulation near the surface is not greatly increased. Ulceration in the skin is seen, commencing as a crack or fissure, which widens out and deepens, presenting the appearance of a shallow excavation with indurated edges and base usually ragged, of pale color; the discharge is thin and ill-smelling; partial healing, with a thin, unhealthy scar, sometimes takes place. When softening of the tumor occurs, from one cause or another, and the skin gives way, there results a deep, crater-like pit, with everted edges, hard, irregular base, and profuse discharge. Hard carcinoma pursues the manner of ulcerating first described, soft carcinoma the latter. Fungous protrusion I have not seen follow carcinoma ulceration. As has been said already it is seen in the ulceration of sarcoma.

Pain is variable. I have repeatedly seen carcinoma of the breast, with implication of the skin and several glandular enlargements in the axilla, and yet the patient only accidentally discovered that the mamma was involved in any morbid process. Two such cases have come under my notice within the past month: both patients were seen within four days after the discovery of the mammary swellings. The classical, lancinating, darting, shooting pains are exceptional in the incipient stage of the tumor; later, however, they are present; with inflammation and sloughing the pain is great; in atrophic scirrhus, with ulceration long continued, pain is extremely varied. Infection of adjacent lymphatic glands in carcinoma is a question of time; sooner or later it will occur, save in rare instances. The axillary glands, substernal, intercostal, and supraclavicular, sooner or later become involved. Just how soon glandular infection occurs is not known, as the primary growth exists some time before being discovered.

The axillary enlargements result from the passage of elements from the original tumor through the lymphatics, and their arrest and growth in the lymph glands, thus reproducing the disease in the armpit, from which, continuing their journey by lymph channels, tumor elements enter the general circulation, and carcinosis results. It will sometimes, though very rarely, be found that general infection occurs without glandular implication to any degree; this is to be explained by direct transmission through veins. Occasionally also slight glandular enlargement will disappear after removal of the original growth; in such a case it is clear that the glands were not carcinomatous, and were probably only irritated, but why this should occur in one case and not in another, we do not yet know. Carcinoma shows a predilection for the liver, lungs, and serous surfaces when it attacks

internal organs. Colloid and cystic degenerations are those most often met with in carcinoma. Inflammation running into abscess is rarely seen except in connection with rapid growth, when also acute sloughing may occur.

The prognosis of carcinoma is extremely grave, if left alone or if operated upon. S. W. Gross<sup>27</sup> gives the average duration of life for patients not operated upon as 27.1 months, and for those who died after they had submitted to an operation, as thirty-nine months; which shows that the operation added a year of life to each patient. He furthermore computes the percentages of recovery at 9.05. Owing to the fact that operation for removal of carcinoma is now extended so as to remove adjacent structures which may be involved in the growth the percentage of recovery has increased enormously; probably twenty-seven per cent. of patients operated upon for carcinoma mammae are now free from recurrence for three years after operation.

Carcinoma following long-continued ulceration of the nipple—Paget's disease—has already been referred to.

Within the past few years our knowledge of adenoma has undergone a great change. Instead of being often met with it is now believed to be one of the growths most rarely encountered, and the so-called adenoid growths, adenocoele, and adeno-cystic tumors are recognized as composed of connective tissue, containing deformed glandular elements—fibromata.

It is doubtful whether it would be possible to differentiate clinically between fibroma and adenoma, nor indeed does it appear to be necessary, since both belong to the category of benign growths, and are to be subjected to like treatment. Perhaps the most notable fact observed in connection with adenoma is the extreme frequency with which cysts occur in its substance, a circumstance which is due of course to the presence of ducts which have undergone dilatation.

Transformation or change in a tumor is met with and is always to be regarded with suspicion if characterized by rapid growth.

**TREATMENT.**—A benign tumor of the breast is removed by freely uncovering it; the incision is to be directed from the nipple outward so as to do as little harm as possible to adjacent ducts, after which the growth is to be freed from attachment. It has been suggested that, to avoid a scar, the following manner of operating be adopted: "Carry an incision as long as necessary around the lower edge of the breast where it joins the thorax, raise the breast, and through the incision indicated remove the growth from the posterior aspect of the gland, arrest hemorrhage, insert a glass drainage tube, replace the breast," etc. Lateral stitches can be inserted before replacing the breast so as to give prominence to the breast. It is probable that few tumors require such an operative measure; benign growths are usually situated in the upper half of the breast, not beneath it, so that an incision through the skin, and at once down upon the tumor, is more simple. As the mamma is generally covered save in exceptional instances, the presence of a scar may be disregarded.

When malignant disease of the breast is presented for treatment it becomes necessary for the surgeon to decide whether an operation is expedient at all or whether the disease has spread so extensively as to preclude the possibility of benefit by operative measures. While it is impossible to lay down hard-and-fast rules, it may be said generally that operation is not expedient if the growth cannot be removed; if life is to be shortened by the operation; if pain and suffering are not to be diminished by the operation. The operation is to be undertaken if there is a good prospect of removing the growth; if life is to be prolonged; if pain and suffering are to be diminished. These questions the surgeon must decide, after which the operation itself must be considered.

It has been before said that outside and around a malignant tumor there is an area of tissue already sown with seed which, if not removed, will reproduce the original growth. Any operation which removes the tumor and leaves this infected area will certainly be followed by

speedy recurrence; free and complete extirpation is therefore the first duty of the surgeon. In carcinoma, and perhaps sometimes in sarcoma, the lymph glands are involved; they are to be taken away. If they are enlarged and cannot be removed, no operation on the breast is to be undertaken. The glands above the clavicle, under the edge of the sternum, and along the ribs are to be searched for and removed. These two latter groups are more apt to be involved if the growth lies to the sternal side of the nipple. Not only the lymph glands but the lymph channels should be taken away with the breast, and these channels are in close relation with the pectoral muscles and axillary fat; so that extirpation of a carcinomatous breast or a sarcomatous one calls for removal of the tumor itself together with the entire mamma and skin over it which is or may be infected, both pectoral muscles, and axillary contents, consisting of fat, fascia, and lymphatics. It will be best, save in rare cases, to carry an incision into the neck, exposing the supraclavicular space, and to remove any lymphatics there found. It is difficult to state the lines of incision which shall enable the operator in all cases to carry out the above requirements. A tumor involving the skin near the sternum, and one involving the skin near the axilla, will call for different incisions.

Speaking generally, then: the breast is to be removed by an incision circumscribing widely the skin over the centre of the growth and passing through healthy tissue. This incision is to be extended into the axilla and down the arm, and will be more or less racquet-shaped, the handle passing through the axilla, and the other end, more or less round, corresponding to the mamma. From this incision a cut is to be carried upward over the clavicle into the neck. To facilitate closure of this extensive wound I divide the skin downward several inches along the anterior axillary line. The flaps so marked out, consisting of skin and connective tissue, are very freely reflected, the incisions are then deepened, and the great pectoral muscle on which rests the mamma is reflected from the thorax and clavicle. The lesser pectoral may be separated with the greater or be taken away during the dissection of the axilla. The axilla is now carefully cleaned by dissection of all fat and lymphatics, during which the lesser pectoral if present is removed. The supraclavicular region, edge of sternum, and intercostal spaces are searched for lymphatics, which are removed. It may be expedient to take away a piece of rib if suspiciously near the neoplasm. Dissection is facilitated by removal of breast and axillary tissue in one piece. Bleeding during the operation is controlled by hæmostats or ligature. As a marked furrow in the muscle distinguishes the portion of the great pectoral which is attached to the sternum from that which is attached to the clavicle, separation of fibres is quickly and easily made, and the clavicular portion rarely if ever requires removal. When left it assists motion of the humerus. So far as my experience goes, splitting the great pectoral tendon and dividing the portion that corresponds to the removed muscle can be accomplished most easily with scissors.

Closure of the large wound resulting from this operation may be effected by skin grafting or by forming flaps as occasion seems to justify; or else healing by granulation may be permitted. Mixer fashions a large flap from the other side of the sternum, and causes the unaffected mamma to slide until it lies near the middle line.

When dissecting an axilla I at once uncover the axillary vein at its lower (brachial) end, and with this as my landmark the affair becomes simple.

Occasionally ligation of the axillary veins is required; I have never seen trouble follow this procedure.

I have observed that patients whose wounds do badly, from erysipelas or other cause, suffer speedy recurrence; an additional reason for securing early cicatrization. Recovery from amputation of the breast is usually rapid, and the mortality is small.

Recurrence after amputation demands extirpation as in the first instance, unless the secondary growth occur at a spot where complete removal is not possible. By repeated operations I have prolonged life and given com-

fort for years. Several years ago I operated upon a single woman, aged forty-eight, for the third time, removing a small nodule as large as a pea, one-fourth inch in diameter, and also two indurated axillary glands. She was first operated upon in 1878, and for the two recurrences in 1882 and 1885 respectively. Microscopic examination enabled me to make a positive diagnosis in regard to its carcinomatous nature. An operation should not be undertaken if the primary growth cannot be removed together with involved axillary glands, or when it is apparent that general infection has already taken place. The surgeon, therefore, must not only examine the apparently affected region, but also investigate the integrity of internal organs as well. Extirpation of mammary growths by means other than the knife, *e.g.*, by caustics, scarcely requires mention; so much the best instrument is a knife, if properly guided. Until we can find a caustic which will seek out and destroy the neoplasm, sparing healthy tissue, the knife will hold the first place. It may perhaps be expedient, when the tissue is very vascular, or when the ribs are suspiciously near the base of a carcinoma, to apply a caustic after the knife has been used, but such instances are exceptions. When an operation is inexpedient, the surgeon must direct his efforts to the relief of the local discomfort by proper dressings, and to the amelioration of the general condition by appropriate medication. The condition of the patient is most unhappy, and I have always thought it expedient to allow opium or its alkaloid, morphine, in sufficient quantity to bring about a state of comparative relief. I have observed that in stout people recurrence of an extirpated growth is more rapid than in those of more slender build.  
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- <sup>1</sup> Journ. Anat. and Phys., July, 1879. <sup>2</sup> Thèse de Paris, 1877.  
<sup>3</sup> Virginia Med. Month., vol. i., p. 87, 1874.  
<sup>4</sup> Dict. des sc. méd., vol. iv., 1813. <sup>5</sup> Idem. <sup>6</sup> Idem.  
<sup>7</sup> Med. Times and Gaz., vol. ii., p. 70, 1855.  
<sup>8</sup> Journ. gén. de méd., p. 57, 1827.  
<sup>9</sup> Journ. Anat. and Phys., November, 1872.  
<sup>10</sup> Thèse de Paris, 1880, p. 63.  
<sup>11</sup> Lancet, 1840, vol. ii., p. 637. <sup>12</sup> Lancet, 1837, vol. i., p. 356.  
<sup>13</sup> Wien. med. Presse, 1883.  
<sup>14</sup> Am. Journ. Med. Sc., 1834, xiv., p. 374.  
<sup>15</sup> Gaz. méd. de Paris, 1859, p. 818.  
<sup>16</sup> Weit. neu. Beit. zur Chirurg., 1841, pp. 42-64.  
<sup>17</sup> Annal. Univ. di Med., 1857, t. cxlix., p. 53.  
<sup>18</sup> Bibliot. de Manget, t. iii., liv. ii., p. 252 (from Labarraque, Thèse de Paris, 1875). <sup>19</sup> Loc. cit. <sup>20</sup> Loc. cit.  
<sup>21</sup> Dub. Quart. J. Med. Sc., 1870, p. 340. <sup>22</sup> Loc. cit.  
<sup>23</sup> Brit. Med. Journ., 1874, ii., 106. <sup>24</sup> Joly: Thèse de Paris, 1851.  
<sup>25</sup> Trans. Edinb. Obst. Soc., 1875, 111, 122.  
<sup>26</sup> Broca: Traité des tumeurs, vol. i., p. 152.  
<sup>27</sup> Tumors of the Mammary Gland, p. 164.

**BREATH.**—air respired (E.) A. S. bræd, breath, odor. Perhaps allied to Latin *fragrare*, to emit a scent; *fragrum*, a strawberry; but this is uncertain.\* Thus in the very origin of the word there is inherent the idea of odor. The breath consists of nitrogen and oxygen, the proportion of the latter being less than that present in the atmosphere; a little more than four per cent. of carbonic acid, aqueous vapor, ammonia, and organic impurities. Within the last quarter of a century, much work has been done in investigating the nature of the organic matter of expired air. Ben, in 1893, obtained 100 c.c. of water from 3,000 litres of expired air. The odor of this water was peculiar but not disagreeable. Its organic contents weighed 5 mgm. There were no alkaloids in it, but it gave a reaction for ammonia. It would seem that this organic matter is not capable of producing acute intoxication, but the untoward effects incident to breathing in limited spaces are due to lack of oxygen. There is no certain knowledge as to whether micro-organisms may be eliminated by the breath, although the laity believe in this possibility. Welch states that the consensus of authority is against the probability of such an occurrence. Experiments have shown the difficulty with which micro-organisms are detached from moist surfaces by air currents, so that it is likely that they are never conveyed to the outside air by ordinary quiet breathing. The proportion of car-

\* Skeats' Etymological Dictionary of the English Language.

bonic acid is increased in the early stages of smallpox, measles, and scarlatina, and during the existence of any extensive skin disease. It is diminished in typhus fever. The temperature varies somewhat, being influenced slightly by that of the external air, but seldom falls below 90° F. When the temperature of the inspired air is very high, as in the hot room of a Turkish bath, the breath may appear, by comparison, to be cool. In fevers its heat is increased, but in the algid stage of cholera it is almost cold.

There is a deplorable lack of knowledge concerning the physiological odors of the breath. In health the breath is nearly odorless, but there is a sweet odor from certain glands about the cutaneous limit around the nostrils. Nature has designed this as a sexual excitator, and together with other attractions between the sexes it helps to insure reproduction of the species. This is not characteristic alone of the female, but the male also, if living a comparatively normal life, possesses the same attraction. The pleasure of kissing is due chiefly to this source. Consequently, in blunted olfactories, osculation loses its greatest charm. Each person is characterized by his own peculiar nasal odor, and the more refined he is, and the higher in the scale of civilization, the more delicate the odor. On the contrary, the coarser the individual, the more heavy the odor, e.g., negroes emit a musky odor. Individuals who are not in good condition for reproduction, or who are lacking in passion, possess slight nasal odors. It has been stated to be absent or disagreeable in pregnant women.

Among the curiosities of literature, there are reported cases of luminous or bright red breath; and others of inflammable breath—in which there was a flash of flame from holding a lighted match near the mouth. This last phenomenon is probably due to the formation of combustible carburetted hydrogen from the chemical decomposition of breath. James Gray, in the *Lancet*, speaks of the "peculiar odor of the breath previous to death," and cites two cases in which was exhaled the same phosphoric odor just before death.

The term *halitosis*, diseased breath, is derived from the Latin *halitus*, breath, and the Greek, *ἄσχος*, disease (Howard). Offensive breath does not express a morbid entity. It is merely a symptom, however extreme it may be,—a functional disorder which may occur at any time of life. It is most common in the male; it may be due to various causes, never produces pain, is present under many different circumstances, is never dangerous, but it is sometimes the most striking and annoying feature of a case, and is so disgusting and humiliating that it causes misery not only to the patient, but to all within his environment. Very slight causes often modify the delicate breath of health, and in certain morbid conditions the odor is quite characteristic, and may be valuable as a diagnostic sign.

The odor of the breath is modified temporarily by many causes. Mental emotion often exerts a powerful influence over the odor of the breath. If the many well-known pathological effects of excessive emotion be reviewed, this fact will not seem strange. For mental disturbance may so change the secretions of the alimentary tract and the glandular system that the normal elimination of waste products is prevented, and an extra burden is thrown on the lungs, with resulting foul breath. Or the sudden excitement may cause a greater destruction of tissue than normal, so that before the intestinal glands can accommodate themselves to this increase the burden of vicarious elimination is thrown on to the lungs. The subjects are, as a rule, conscious of its presence. There is generally a pasty taste in the mouth, and this together with the disagreeable breath may be almost instantaneous with the occurrence of the emotion. Such patients are commonly neurotic and high-strung, and possess a mercurial temperament. Many volatile substances taken into the system through the ordinary channels are excreted in part through the lungs, and impart their odor to the breath. Thus turpentine, alcohol, onions, cheese, spices, and many other

alimentary and medicinal substances taken into the stomach are quickly detected by their peculiar smell in the expired air. In women the expired air frequently acquires a disagreeable character during the menstrual period, said to be due to the nasal and retro-nasal secretion of the mucous membrane, which at that time is congested. In feverish conditions the breath acquires a sweetish, or sometimes sickening, character. This is particularly noticeable in children, and in them is often suggestive of the odor of chloroform. In diabetes mellitus there is often a peculiar sweetish odor, which is difficult to describe, and which has been likened to that of honey, sweet apples, or hay. In uræmia the breath is said often to acquire a strongly ammoniacal odor due to the non-elimination of the urea, which persists in the blood and combines with the water to form carbonate of ammonia. The skin also exhales the same odor. In pyæmia also the breath is peculiar and characteristic. Dr. Tavignot, a French writer, described, some years ago, a peculiarity of the breath in glaucoma, to which he gave the name of *halitine safranée*; and he maintained that this was constantly present in persons suffering from that affection. There are cases recorded of extensive burns in which the breath, formerly sweet, has assumed the disgusting odor of bisulphate of carbon. Migraine is often accompanied by a bad breath. Tuberculosis can often be detected by a characteristic breath. Pernicious anæmia, pseudo-leukæmia, and interstitial nephritis frequently have this symptom.

Various mineral substances, which are themselves nearly or quite without smell, cause, when introduced into the system in sufficient quantities and during a certain period of time, a very disagreeable odor of the breath. This occurs from stomatitis in some cases, and in others from the disturbance of digestion, induced by the chronic poisoning. The substances which most frequently are concerned in the production of toxic halitosis are: antimony, arsenic, lead, mercury, phosphorus, and sulphur. Sulphur imparts a distinct odor not only to the breath, but also to the perspiration after two hours.

In chronic alcoholism the odor of the expired air is very foul, not necessarily alcoholic unless liquor has been recently taken, but possessing a peculiarity all its own, and unlike anything else. The excessive use of tobacco not infrequently imparts a foul odor to the breath.

A permanent foulness of the breath is due either to interference with the elimination of the products of decomposition by the intestines and kidneys or to local causes existing in some part of the respiratory tract.

Perhaps the most frequent cause of a bad breath is dyspepsia, either gastric or intestinal. The hurry, excitement, and worry characteristic of our present century are greatly to blame for these ills. Overwork, excessive application to business, sedentary habits, and the habit of "bolting" food, all bring in their train irremediable results. In this case the elimination of the products of decomposition and of the effete matters of the tissues by the normal channels is interfered with to a greater or less extent, and the task of their excretion from the economy is in part thrown upon the lungs. The expired air contains a large amount of organic matter, which is often very ill-smelling and offensive. In cancer of the stomach or liver, disordered digestion is often heralded by a foul breath. In chronic constipation, especially, the odor of decomposing organic matter is most marked. The most common causes of constipation are a decrease in the secretion of mucus from the glands in the intestinal walls, or deficient peristalsis of the musculature of the same. Hepatic disorders always entail certain disturbances of digestion. A very common symptom of intestinal worms, especially ascarides in children, is foul breath.

Among local causes there are various affections of the mouth, nose, pharynx, larynx, and lungs.

Dental caries is a well-known cause of foul breath. This arises not only in consequence of the decay of the teeth, but also, and chiefly, from decomposition of food lodged in the cavities and between the teeth; also from

tartar and the micro-organism *leptothrix buccalis*. These causes may give occasion to a fetid breath in persons who are careless in cleansing the mouth, even when the teeth are perfectly sound. Gingivitis, from arsenical or mercurial poisoning, or from scurvy, may give rise to a bad breath, as may also syphilitic ulcerations of the buccal cavity or fauces. Pyorrhæa alveolaris is also another cause. "Spontaneous stomatitis" occurs without any apparent cause. The entire interior of the mouth is affected, and the fetid saliva taints the breath. In many points this affection resembles mercurial stomatitis. Follicular stomatitis occurs at any age. This inflammation takes its origin in the follicles of the mucosa, on the inside of the lips, and on the sides of the tongue. In certain cases a vesicular eruption (herpes) is the first manifestation of the disease. There is a condition known as catarrh of the tongue, which is usually associated with dyspepsia, but may occur independently of it. Here again decomposition of mucus, epithelial scales, and food particles as well as bacteria are the offending cause. In necrosis of the jaw which may result from mineral poisons, decayed teeth, or syphilis, the odor is frequently sickening. The breath of patients suffering with carcinoma of the tongue and neighboring parts is very penetrating, but that from cancrum oris, stomachacæ, or noma, is almost unbearable, and once experienced can never be forgotten.

In nasal polypi, after the secretion from the nose becomes muco-purulent, the breath is apt to be disagreeable. Ozæna, from whatever cause produced, is frequently responsible for a most foul and repulsive odor. This is due, according to Browne, to the fact that "the crusts and discharges usually contain decomposing fatty globules and micro-organisms." Mouth-breathers with nasal stenosis are often afflicted with bad breath.

Like the odor of necrosis of the jaw, that of follicular tonsillitis and pharyngitis is sickening. In the latter case the odor is due to decomposition of the secretion and food particles filling up the follicles, and is often suggestive of faecal matters. This inspissated secretion becomes cheesy in consistency. "Chronic enlargement of the tonsils is apt to occur in young people with the so-called scrofulous diathesis. The breath in these cases is often foul. In diphtheria there may be a disagreeable fetor of the expired air suggestive of putrefaction. This is especially true of epidemic diphtheria. Putrid sore throat shares with diphtheria this symptom of halitosis. Syphilitic and tuberculous ulcerations in the larynx often impart an unpleasant odor to the breath, and the fetor of some forms of bronchitis, of bronchiectasis, and of abscess and gangrene of the lungs is too well known to require any description.

Finally, some individuals suffer from a more or less fetid breath, the cause of which it is impossible to discover. It is often congenital; it is constant, and not dependent upon any apparent deviation from health, but is often associated with a strong and unpleasant odor of the sweat and other secretions.

In the following table the various conditions leading to the production of a bad breath are arranged under their several classes for convenience of reference:

CAUSES OF HALITOSIS.

Transient . . . . .	{ Mental disturbance. Various ingesta, medicinal and alimentary. The menstrual period.
Systemic . . . . .	{ Fevers. Diabetes mellitus. Uræmia. Pyæmia. Glaucoma (?). Burns. Migraine. Tuberculosis. Pernicious anæmia. Pseudo-leukæmia. Interstitial nephritis. Antimony. Arsenic. Lead. Mercury. Phosphorus.
Toxic . . . . .	{ Sulphur. Alcohol. Tobacco. Gastritis. Dyspepsia. Cancer of stomach or liver. Constipation. Hepatic disorders. Enteritis. Intestinal worms, particularly ascarides in children. Dental caries.
Buccal . . . . .	{ Gingivitis. { Toxic. { Scrofulous. { Syphilitic. Stomatitis. { "Spontaneous." { Follicular. Pyorrhæa alveolaris. Lingual catarrh. Necrosis of jaw. Carcinoma of tongue and other parts. Cancrum oris. Lack of cleanliness. Polypi.
Nasal . . . . .	{ Ozæna. { Herptic. { Syphilitic. { From foreign bodies. { Scrofulous. { Idiopathic. { Osteo-necrotic.
Faucial . . . . .	{ Follicular tonsillitis. Follicular pharyngitis. Syphilitic ulceration. Diphtheria. Putrid sore throat. Carcinoma.
Laryngeal . . . . .	{ Ulceration. { Syphilitic. { Tuberculous. Bronchiectasis. Putrid bronchitis. Tuberculous ulceration (cavities). Gangrene. Abscess. Carcinoma.
Pulmonary . . . . .	{ Pulmonary tuberculosis. Carcinoma.
Idiopathic.	

Toxic . . . . .	{ Sulphur. Alcohol. Tobacco. Gastritis. Dyspepsia. Cancer of stomach or liver. Constipation. Hepatic disorders. Enteritis. Intestinal worms, particularly ascarides in children. Dental caries.
Digestive . . . . .	{ Gingivitis. { Toxic. { Scrofulous. { Syphilitic. Stomatitis. { "Spontaneous." { Follicular. Pyorrhæa alveolaris. Lingual catarrh. Necrosis of jaw. Carcinoma of tongue and other parts. Cancrum oris. Lack of cleanliness. Polypi.
Buccal . . . . .	{ Gingivitis. { Toxic. { Scrofulous. { Syphilitic. Stomatitis. { "Spontaneous." { Follicular. Pyorrhæa alveolaris. Lingual catarrh. Necrosis of jaw. Carcinoma of tongue and other parts. Cancrum oris. Lack of cleanliness. Polypi.
Nasal . . . . .	{ Ozæna. { Herptic. { Syphilitic. { From foreign bodies. { Scrofulous. { Idiopathic. { Osteo-necrotic.
Faucial . . . . .	{ Follicular tonsillitis. Follicular pharyngitis. Syphilitic ulceration. Diphtheria. Putrid sore throat. Carcinoma.
Laryngeal . . . . .	{ Ulceration. { Syphilitic. { Tuberculous. Bronchiectasis. Putrid bronchitis. Tuberculous ulceration (cavities). Gangrene. Abscess. Carcinoma.
Pulmonary . . . . .	{ Pulmonary tuberculosis. Carcinoma.
Idiopathic.	

The treatment of a foul breath consists essentially in discovering, and, if possible, removing the cause. In by far the largest number of cases the origin of the trouble resides in digestive disturbances, usually associated with constipation, or in carious or dirty teeth. The first care of the physician should be, therefore, to regulate the digestive functions, and to see that the hygiene of the mouth is properly attended to. If the gums are spongy or receding, a tooth wash containing myrrh should be used. All cavities should be plugged with gold or some other suitable filling, as the dentist may advise, and the tartar, which accumulates between and behind the teeth, should be removed from time to time. The teeth should be picked, after each meal, to remove the particles of food, or, better still, they should be cleansed by means of dental floss, and should then be brushed with plain water, soap and water, or a reliable dentifrice. If the stomach is at fault, in addition to the remedies suitable to the condition, a piece of charcoal cake or charcoal powders may be taken shortly after meals. An odor which cannot be removed may be more or less effectually disguised by oil of nutmeg, cinnamon, cardamom seed, cloves, pimenta, lavender water, sweet-flag, leaves of the common partridge berry, or allspice, coffee, and other aromatics. A solution of carbolic acid (1 to 200) may be used as a mouth wash or gargle when the fetor is due to organic destruction of tissue. The following is an agreeable mouth wash which will often disguise unpleasant odors: Thymol, 0.50 gm. (7½ grains); borax, 1 gm. (15 grains); distilled water, 500 gm. (1 pint). The mouth is to be rinsed frequently with this solution.

For persistent foul breath, Howe advises the following combination. In the first place, the teeth should be thoroughly cleansed and the gums sponged with a solution of myrrh and water; then one of the following wafers may be allowed to dissolve in the mouth.

R Pulv. cinnam.,  
Pulv. pimenta,  
Pulv. cardam. . . . . ãã ʒ ss.  
Sacchari alb. . . . . ʒ i.  
Mucil. gum. acaciæ . . . . . q. s.  
Make fifty pills.

In conjunction with these wafers, the following may be employed:

- R Pulv. carui sem.,
  - Pulv. coriandri sem.,
  - Pulv. cinnam. . . . . 5ā 3 ss.
  - Sacch. alb. . . . . 3 i.
  - Mucil. gum. acacie. . . . . q. s.
- Make fifty pills. Dissolve one in the mouth when necessary.

All these deodorizers are, however, of necessity merely palliative in their effects, and the cause should always, if possible, be searched for and removed. In the preparation of the foregoing article the present writer has made free use of the material published under the same heading in the previous edition.

Emma E. Walker.

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BRIDES-LES-BAINS is a spa in Savoy, France, often called, because of the composition of its waters, the French Carlsbad. Until recently the place was practically inaccessible, the nearest railway station being

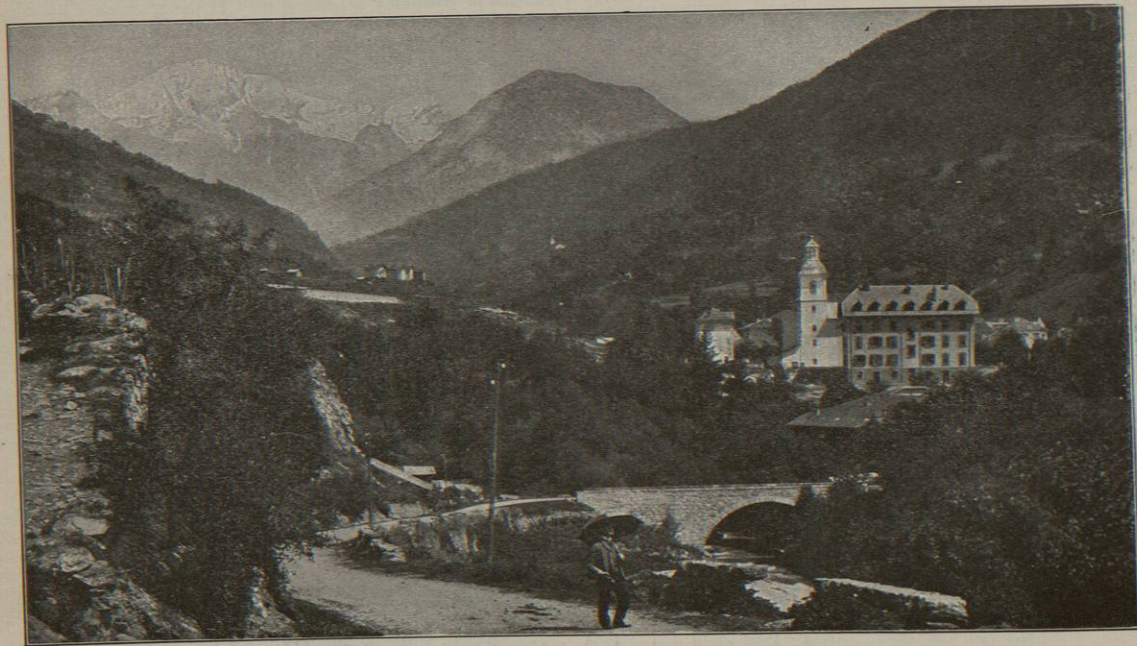


FIG. 1052.—Brides-les-Bains and the Glaciers of the Vanoise.

20 miles away. Now, however, the railroad has been extended and there is a station at Moûtiers, distant only 3 miles. The village is most picturesquely situated, at an altitude of 1,800 feet above sea level, in a valley running from southeast to northwest, enclosed on either side by almost precipitous mountain slopes.

Access.—The station of Moûtiers is on the Paris, Lyons, Mediterranean Railway, 672 miles, or 13 hours, from Paris; fare, 75 fr. 35 c. first class, and 50 fr. 90 c. second class.

Analysis.—The following is the composition of the water, according to an analysis made by Willm in 1890:

	Grams, per litre.	Grains, per pint.
Carbonate of calcium . . . . .	0.3133	2.7752
Carbonate of magnesium . . . . .	.0112	.9692
Carbonate of iron . . . . .	.0078	.6832
Silica . . . . .	.0464	.4108
Chloride of sodium . . . . .	1.8318	16.2244
Sulphate of sodium . . . . .	1.1694	10.2836
Sulphate of potassium . . . . .	.0946	.8380
Sulphate of lithium . . . . .	.0085	.0840
Sulphate of calcium . . . . .	1.7143	15.1940
Sulphate of magnesium . . . . .	.5288	4.6836
Arsenate of sodium . . . . .	.0008	.0071
Phosphates, bromides, iodides . . . . .	Traces.	Traces.
Carbonic acid forming bicarbonates . . . . .	.2664	2.6012
Free carbonic acid . . . . .	.1017	.9008

Indications.—The waters of Brides are in moderate doses laxative, in larger quantities (six to eight glasses daily) purgative. It is claimed that they can be taken for many days in succession without increasing the dose, and they do not irritate to the same degree as do many of the stronger purgative waters. They are used in various disorders of the abdominal viscera, such as congestion of the liver following dietetic imprudences or alcoholic excesses or a prolonged residence in the tropics, gall-stones, constipation, functional disturbances of the digestive tract, obesity, the so-called uric-acid diathesis, gravel, diabetes, anæmia and chlorosis, and chronic con-

gestion of the uterus and adnexa. In many cases treatment with Brides water internally is combined with baths at Salins-Moûtiers, distant two miles from Brides.

Accommodations.—There are four hotels at Brides, in addition to numerous boarding houses, which afford good and ample accommodations at from six to eight francs and upward a day. A casino, music in the park, and the usual attractions of the continental spa are to be found here. There are two churches, a Catholic and a Protestant, the latter being served by an English clergyman during the season. The climate is mild, but not enervating. The season extends from the middle of May to the middle of September.

SALINS-MOÛTIERS.—This is a small thermal station in Savoy, France, distant 672 miles from Paris, on the Paris, Lyons, Mediterranean Railway. It is situated in a narrow valley in a grandly picturesque country, at an elevation of about 1,500 feet above the level of the sea. It is 2 miles from Brides-les-Bains, with which it is connected by an electric railway.

Analysis.—The following is the composition of the water, according to an analysis made by M. Willm, Professor of Chemistry at Lille, in 1890:

	Grams, per litre.	Grains, per pint.
Carbonate of calcium . . . . .	0.6488	5.8382
Carbonate of magnesium . . . . .	.0089	.8011
Carbonate of iron . . . . .	.0136	.1224
Silica . . . . .	.0332	.2988
Chloride of sodium . . . . .	12.4886	112.3974
Chloride of potassium . . . . .	.1695	1.5255
Sulphate of lithium . . . . .	.0046	.0414
Sulphate of calcium . . . . .	2.0638	18.5742
Sulphate of magnesium . . . . .	.8460	7.6140
Arsenate of sodium . . . . .	.0007	.0063
Phosphates, bromides, iodides . . . . .	Traces.	Traces.
Organic matters and losses . . . . .	.0192	.1728
Carbonic acid forming bicarbonates . . . . .	.5906	5.3154
Free carbonic acid . . . . .	.3854	3.3486

Indications.—The waters of Salins-Moûtiers are employed chiefly for bathing, usually in connection with the internal use of the water of Brides-les-Bains, but they are also taken internally in special cases. According to D. W. Samways, "for young people with enlarged glands, anæmia, chlorosis, or general lack of vigor, these baths are excellent, especially in conjunction with the climatic advantages of the locality. For the overworked or neurasthenic, for those also in whom convalescence is tardy, they are similarly very reviving. For such cardiac affections as can be relieved or controlled by baths and exercises similar to those in vogue at Nauheim, and for certain congestions and disorders of the uterus and its appendages they are also very beneficial."

Accommodations.—There is a hotel at Salins-Moûtiers, and there are also many boarding houses in the village where guests may find suitable accommodations. Most of those who take the baths, however, do so in conjunction with the internal use of the waters of Brides-les-Bains, and live at the latter place. The climate is mild but invigorating. The season lasts from the middle of May to the middle of September.

Edward O. Otis.

BRIGHT'S DISEASE. See Kidneys, Diseases of the.

BROMAL HYDRATE.—C<sub>2</sub>HBr<sub>3</sub>O<sub>2</sub>H<sub>2</sub>O. Like chloral, bromal is an oily fluid which, uniting with water, forms a crystalline hydrate. Bromal hydrate occurs in white crystalline masses of a sharp, burning odor and taste, fusible at 53.5° C. (128.3° F.), and soluble in water. Physiologically the drug is severely irritant, and, absorbed into the circulation, has been found by experiment (Steinauer) to cause restlessness followed by sleep, and, if the dosage be pushed, dyspnoea, convulsions, and death. It may relieve pain, and has been thought to be of avail in averting threatened epileptic fits, but it is not official in the United States Pharmacopœia and is little used in

medicine. It has been given in three-grain doses (Steinauer), but it is so disturbing to the digestive functions that the dose must be given in great dilution.

Edward Curtis.

BROMALIN.—Hexa-methylene-tetramine-brom-ethylate; brom-ethyl-formin—(CH<sub>2</sub>)<sub>6</sub>NHC<sub>2</sub>H<sub>5</sub>Br—made by acting upon hexamethylene tetramine with ethyl bromide. It is in colorless scales or a white crystalline powder, almost tasteless and freely soluble in water. It is decomposed by heat. Bromalin was introduced to take the place of the alkaline bromides in epilepsy, and may be used in other conditions in which bromides are indicated. The dose is gr. xv.-lx., and even large quantities are said not to cause bromism.

W. A. Bastedo.

BROMAMIDE.—Tri-brom-aniline-hydrobromide—C<sub>6</sub>H<sub>2</sub>Br<sub>3</sub>NH<sub>2</sub>HBr—nitro-tri-benzol is reduced by nascent hydrogen and then acted upon by hydrobromic acid to form bromamide. It occurs in colorless acicular crystals without odor or taste and is readily volatilized by heat. It is insoluble in cold alcohol, soluble in sixteen parts of boiling alcohol, and in chloroform, ether, and fixed oils. As an analgesic, sedative, and antipyretic it has been shown to act promptly and effectively in acute and chronic rheumatism and neuralgia. Dose: gr. v.-xv. in powder or capsule several times a day.

W. A. Bastedo.

BROMELIACEÆ.—A family of some forty genera and probably five hundred species, almost entirely tropical, in both hemispheres, a few sub-tropical. The family, by virtue of its structure, epiphytic habits and relations, is one of the most interesting known to botanists, and very many of its members are highly ornamental. Its economic importance is considerable. The pineapple is its most important product. The leaves of many species are important fibre-yielders, and the well-known "Florida moss" or "black moss" (*Tillandsia usneoides* L.) has many uses. The dissolving power of pineapple juice upon albumen has been utilized in diphtheria to a slight extent. Its value as an aid to stomach digestion is probably of far greater importance, and the same property appears to exist in some of the leaf juices.

Henry H. Rusby.

BROMIDES.—1. GENERAL MEDICINAL PROPERTIES OF THE BROMIDES.—Compounds of bromine, whose basylous radicle is innocuous enough to permit of their medicinal administration in decided quantity, all show a certain influence over the animal system, commonly, and undoubtedly rightly, referred to the action of the bromine of their composition. Of the effects, the most striking feature is derangement of nerve function, which, in moderate dosage, takes the form of a deadening of reflex irritability, cerebral and spinal, and in poisonous administration shows itself as failure of power, voluntary as well as reflex, in the cerebro-spinal centres. Clinically, the prominent effects are that the nervous, agitated, and wakeful subject becomes calm, tranquil, and predisposed to sleep; that convulsive seizures, the expressions of unnatural reflex irritability, such as the convulsions of epilepsy and of tetanus, tend to abate in frequency and violence; that a qualmish stomach becomes quieted, that tickling of the fauces fails to provoke gagging, and that sexual eagerness and even power wane. In profound bromism what was at first intellectual laziness and indifference becomes positive stupidity, with failure of memory and with or without a certain grade of aphasia; what was a dulness of reflex activity passes to motor and sensory weakness—paresis of sight, hearing, and tactile sense and profound muscular debility, until at last, after apparently total abolition of all conscious existence, the poisoned subject dies, either from respiratory or from cardiac failure. Minor effects, in cases of continuous bromide medication, are a peculiar fetor to the breath, a tendency to an acneiform eruption, most pronounced on the face, arms, back, and buttocks, and a tendency to congestion and even œdema of the fauces