To Cover the Chest.—Place the point of the bandage upward on the shoulder of the side most affected. Tie or pin the two ends and point of the bandage at the back.

To Cover the Hip.—Place the point of the bandage upward and secure it under a second bandage folded long and used as a girdle. Tie the two ends of the triangular bandage around the thigh.

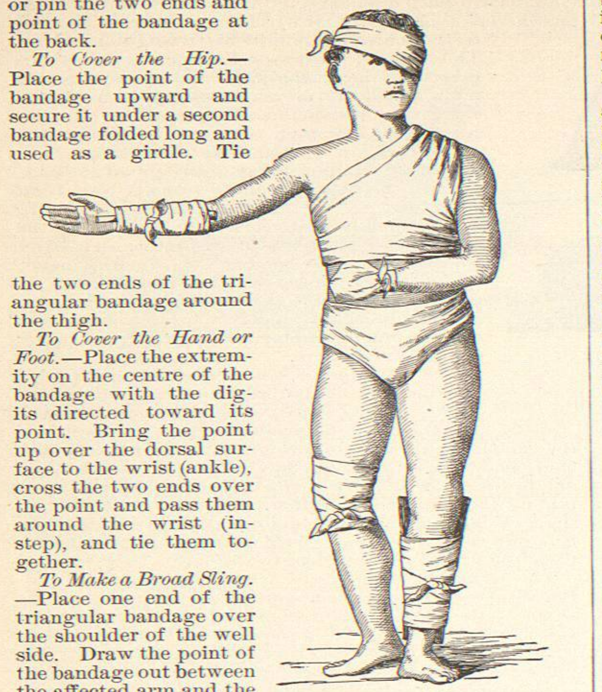

FIG. 1667.

To Cover the Hand or Foot.—Place the extremity on the centre of the bandage with the digits directed toward its point. Bring the point up over the dorsal surface to the wrist (ankle), cross the two ends over the point and pass them around the wrist (instep), and tie them together.

To Make a Broad Sling.—Place one end of the triangular bandage over the shoulder of the well side. Draw the point of the bandage out between the affected arm and the body. Carry the other end up over the injured arm and tie at the back of the neck. Draw the point around the elbow and pin to the bandage.

To Make a Narrow Sling.—Fold the handkerchief into a long strip and knot at the back of the neck. In this form of the sling, as well as in the other, the part of the sling which lies between the arm and the chest passes over the well shoulder.

To Make a Tourniquet (Fig. 1666).—Tie a folded handkerchief loosely about the arm or leg, and wind up with a short stick.

Other simpler methods of applying a folded handkerchief are shown in the illustrations (Figs. 1667, 1668, and 1669).

Application of Plaster of Paris.—Plaster of Paris is used in bulk for making impressions of any part of the body. The plaster should be of fine quality, but above all fresh so that it will set quickly. The dry plaster should be stirred into the required quantity of water until a thick paste results. This should be held for a few minutes against the part of the body of which an impression is desired. When the plaster has set it is removed as one piece, its inner surface smeared with vaseline and used as a mould, into which a freshly made plaster-of-Paris paste can be poured or pressed. In this manner an exact reproduction of the body can be made. In such a manner a model of the instep is taken for the fitting of a flat-foot brace. In order to avoid holes in the casting the outside plaster mould should be moistened before the plaster paste is poured into it.

If a mould of a round object is desired, such as the arm or the whole foot, two strings may be fastened along the limb on opposite sides with collodion, and pulled out through the plaster-of-Paris casing before that has set too hard to prevent it; or the limb may be placed horizontally in a basin and the plaster-of-Paris paste piled up around it to the middle and allowed to set. The upper surface is then smeared with vaseline and the limb is entirely covered with a new lot of paste. In this manner two separate moulds, each of which will halfway surround the limb, may be obtained. For use they may be tied together. A little vaseline rubbed over the skin facilitates the removal of the limb from the uninjured mould.

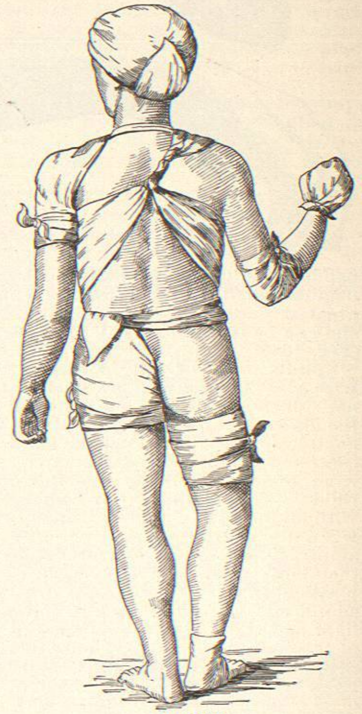

FIG. 1668.

To immobilize a limb plaster of Paris is not used alone, but is rubbed into the meshes of a gauze, or, better, crinoline bandage. In this manner the rigidity of the plaster is added to the strength of the cloth, and there is a great saving in weight. The crinoline is torn into strips three or five inches wide and six yards long. These are loosely rolled up by hand; during the process the meshes of the crinoline are filled with fresh dry plaster of Paris, by scraping the powder over the strip of crinoline, as it lies on the table, with a spoon or knife. To put on a good plaster splint one needs an assistant to steady the part, make traction, etc., thin strips of cotton rolled up, a gauze bandage, a pail of warm water, and the requisite number of plaster-of-Paris bandages of a width suited to the part; for example, four to six three-inch bandages for a fractured leg, six to eight five-inch bandages

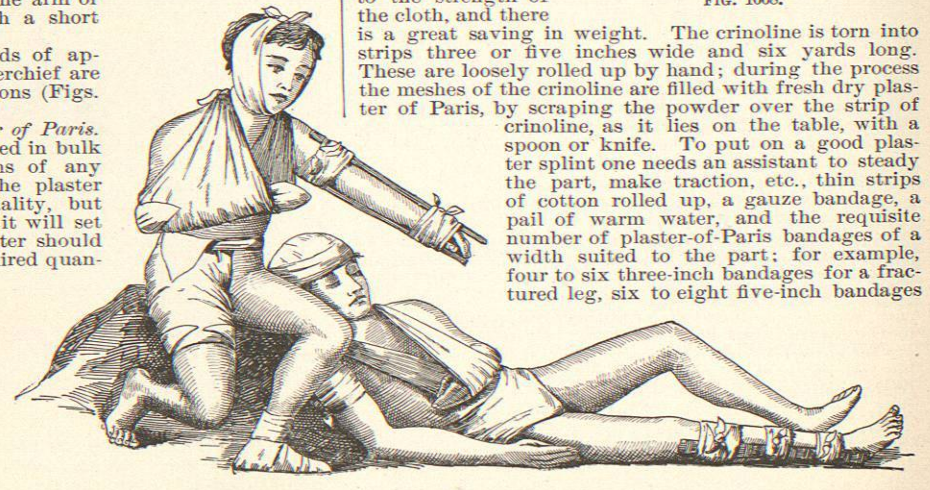

FIG. 1669.

for a plaster jacket, etc. The assistant holds the limb in the correct position. The surgeon covers it entirely with the thin cotton as with a bandage. The glazed cotton batting used by dressmakers is excellent for this purpose. If absorbent or non-absorbent cotton is used, a gauze bandage is next applied so that all shall be smooth before the plaster is put on. One plaster bandage is sunk slowly into the water until it stands on end on the bottom of the pail. The water must cover its upper end. When the air bubbles have ceased to rise it is lifted out, squeezed dry with as little loss of plaster as possible, and quickly and evenly applied. The bandage should be put on regularly from the toes up. No reverses should be made, nor figure-of-eight, nor other fancy turns. Each time the bandage should ascend sharply, pass behind the limb and descend sharply, crossing the ascending turn at right angles. The slack of the distal or lower edge of the bandage should be taken up while the descending turn is being made, pressed smoothly backward, and be folded behind the limb where it will be covered in by subsequent turns. If a bandage is applied in this manner it will be perfectly smooth, have a uniform thickness throughout, and the crossing of the ascending and descending turns nearly at right angles will obviate ridges in the bandage and give it a maximum strength for the amount of material employed. As the turns are applied they should be slicked with the hand from above downward to insure their lying in close apposition so that the completed splint shall be one piece. For the same reason it is better to make each bandage cover a considerable portion of the limb, making each ascending turn an inch above the preceding one, and starting the second bandage far below where the first one ends, than it is to place each ascending turn but a fraction of an inch higher than the preceding one in order to complete the bandage as far as that particular bandage will go. When the last bandage has been applied, the whole should be rubbed down smooth with the hand or a cloth, and if a smooth surface is desired a little plaster paste can be smeared over the surface. This is of help in strengthening a weak part, and it can also be used to obscure the turns of the bandage if they have been carelessly applied.

If the bandage is to be used as a splint which can be taken on or off, it should be cut from end to end before it gets very hard, but should not be removed, or if so, should be reapplied and bandaged to the limb with a gauze bandage until it is thoroughly dry.

If the splint is intended to reach only part way around the limb, the edges may be cut away as far as desired. In this manner a light rigid splint may be secured which will exactly fit any part of the body.

Plaster-of-Paris bandages may also be used to make splints by wetting them, and running them back and forth on a table until eight or twelve thicknesses of material have been placed one on another in a long strip. Additional plaster-of-Paris paste should be rubbed into them if necessary. These are well rubbed together, and the flexible splint is applied. It can be trimmed with shears, and when properly fitted it is bandaged in position with gauze. Two such strips have been much used by Stimson in the treatment of Pott's fracture.

To remove an old plaster splint numerous saws and shears have been devised, which are for the most part unsatisfactory. Nothing is needed but a sharp knife, a little absorbent cotton, and a few drops of water. Draw the knife lightly along the line of incision, follow it with a wet cotton swab. Repeat these two steps many times. As the cut grows deeper the knife should be inclined first to the right then to the left, so as to cut out a V-shaped gutter. This will keep the knife from catching in the cut. If this plan is followed a plaster jacket can be removed with a penknife in a few minutes. A stronger knife is preferable, such as a pruning knife, but keenness of edge is more important than size. When the plaster has been cut through the underlying cotton can be easily cut with bandage scissors.

Edward Milton Foote.

DROP FINGER. See *Hand and Fingers.*

DROPSY. See *Ascites* and *Œdema.*

DROSERACEÆ.—(*Sundew Family.*) From a biological point of view, this is one of the most interesting families of plants, owing to its carnivorous properties, as typified in the much celebrated Venus' fly-trap. Since this tendency to secrete flesh-digesting fluids is shared, to a greater or less extent, by other plants in the family, questions have been prominent as to whether they might not be utilized as digestants. The use which has been made of those species which are utilized in medicine has, however, not been chiefly in this direction, but as pectorals of an anodyne character. The species so used are of the genus *Drosera*, or sundew. To some extent they have been utilized as carminatives and gastric anodynes. The dose is 0.3 to 2 gm. (gr. v. to xxx.).

Henry H. Rusby.

DROWNING. See *Artificial Respiration.*

DROWSINESS is the manifestation of the desire for sleep, and is ordinarily shown by heaviness of the eyelids, by difficulty in keeping the attention fixed, and often by yawning. Still these indications of approaching sleep are not always present, for many persons pass almost at once from a condition of mental and physical activity into sleep, especially when in familiar surroundings, or when relieved from responsibilities which may have been long continued and sufficiently great to act as a stimulant while they lasted. Nurses and sailors furnish illustrations of this fact. The phenomena of normal or physiological drowsiness need little attention in this place, for every one is familiar with them. Siemens classes as normal the sleepiness of sucklings and children, of convalescents, of the exhausted, and of those who have been exposed to extreme cold. Still it behooves the physician to be on his guard not to confound an unusual though healthy manifestation of sleepiness with a pathological state, nor, on the other hand, to fail to recognize and distinguish the relations of a drowsiness of pathological origin. Before considering the various forms of morbid drowsiness it will be necessary to give some attention to the causes of normal sleep. This subject has long been a favorite one with physiologists, and many theories have been advanced to explain the phenomena. It would be foreign to our subject to attempt a résumé of all these efforts to explain this act of nature. In the course of the last forty years, however, an agreement seems to have been reached on certain points, such as the following, viz: 1. That a period of rest is a requisite for the healthy maintenance and normal functional activity common to all parts of the animal system, even of those the almost constant activity of which is essential to the continuance of life. Sleep affords this rest and an opportunity for regenerating the energies of the brain cells. 2. The nutrition of the nervous elements is believed by some to be favored by the less active circulation of the blood during sleep, which latter condition is now recognized as a fact, although it is not agreed whether this anæmia is to be considered a direct cause of sleep or an incident of other conditions leading to it. 3. A relation between the activity of function in other organs, such as the stomach or the skin, and the circulation in the brain has been observed and recognized too long to be ignored as being one of the conditions favoring sleep; but when we come to consider the influences attributable to changes in the composition of the blood, whether from the presence of carbon dioxide, of an excess of the normal results of digestion, or of the products of the functional activity of the brain cells themselves, we find ourselves again upon debatable ground.

With a view to presenting a summing up of the most recent and accepted views I cite from Howell, who says that sleep is required in order to recover from fatigue; that the cessation of stimuli, decreased responsiveness of the active tissues, a change in the composition of the blood, and a diminution of the blood supply to the brain are the preliminaries to sleep. He regards the fatigue of the vaso-motor centre in the bulb as the important cause of the diminished blood supply to the brain, this fatigue being caused by the continuous activity of the centre during waking hours. He also considers that the active tissues (nerve cells and muscles) as the result of their activity yield some by-product which is carried by the blood through the central system and becomes the chief cause of sleep. These views are in substantial accord with those of Lyman and Siemens. Durham quotes the following from Wilson Philip in the Philosophical Transactions, 1832: "That sleep alone is healthy from which we can be easily aroused. If our fatigue has been such as to render it more profound, it partakes of the nature of disease." Fred. J. Smith also says: "If a normal temperature is found in a man who can be easily roused, and if at the same time his pupils are active, probably nothing serious is the matter with him"; and Hammond and Da Costa also emphasize the diagnostic significance of the ability to rouse a person apparently asleep. Returning now to our proper subject of drowsiness, which in the healthy state is the precursor or the minor degree of sleep itself, we find the causes of this condition when pathological thus grouped by Dana:

"The causes of ordinary forms of drowsiness and somnolence are:

"I. Old age, when there is a weakened heart or diseased arteries with cerebral malnutrition.

"II. The diseased vascular conditions which precede cerebral hemorrhage.

"III. The cerebral malnutrition or inflammations occurring during or before certain forms of insanity.

"IV. Various toxæmiæ, *e.g.*, malarial, uræmic, cholæmic, syphilitic.

"V. Dyspepsia.

"VI. Diabetes.

"VII. Obesity.

"VIII. Insolation.

"IX. Cerebral anæmia and hyperæmia.

"X. Cerebral tumors and cranial injuries.

"XI. Exhausting diseases.

"XII. The sleeping sickness of Africa."

It will be convenient to take up the consideration of these in order:

I. *When due to the Weakened Heart or Diseased Arteries with Cerebral Malnutrition in old Age.*—This is quite in line with the views which Hammond so frequently urged, for he says: "Whatever lessens the amount of blood normally circulating through the brain tends to produce somnolence, *e.g.*, any enfeeblement, especially in the aged." Gasquet also says that "in old people drowsiness usually coexists with weak heart action and stagnation in the central and pulmonary vessels."

II. *The Diseased Vascular Conditions which Precede Cerebral Hemorrhage.*—This group of causes includes especially atheromatous and syphilitic disease of the arteries and miliary aneurisms, with perhaps the addition of impoverished or toxæmic blood resulting from degeneration or inadequacy of one or more of the emunctories.

III. *The Cerebral Malnutrition or Inflammations Occurring during or before certain Forms of Insanity.*—According to Boyer, somnolence may at such times be characterized by a special form of *sleeplessness.* He says that somnolence is an intermediate stage between sleeping and waking, which in health precedes normal sleep, but which in sickness is accompanied by cerebral excitement, and is an obstacle to sleep, with sometimes illusions and hallucinations, and leading even to a condition of sub-delirium before sleep is finally attained, these features not being recalled by the patient on waking. Siemens also notes drowsiness as often occurring in the beginning and sometimes in the course of dementia paralytica.

IV. *Various Toxæmiæ, e.g., Malarial, Uræmic, Cholæmic, and Syphilitic.*—In regard to these causes of drowsiness we may quote from Gasquet as follows: "Sleepiness is produced by the retention in the blood of certain products of tissue change, and the active agent is very probably CO_2." Conner also lays it down that there is poisoning by CO_2 in conditions of dyspnœa, uræmia, etc. Whatever the poison may be of which we recognize the effects in what we call uræmia, as a cause of drowsiness, Da Costa declares that the strong point in diagnosis is that the coma is preceded by convulsions. The pupils are apt to be dilated and react slowly to light, while Fred. J. Smith says the pulse is likely to be small and rapid. Conner also considers that "in icterus the toxæmia is due to the failure of the action of the bile as a digestive secretion and to the reabsorption of the bile into the blood through the lymph vessels of the liver." The drowsiness in icterus, according to Gilbert and Castaigne, is due to cholæmia on the one hand, and to a nervous predisposition on the other. Da Costa and Osler refer to somnolence as a feature of acromegaly, but do not point out its probable cause.

V. *Dyspepsia.*—In its severer forms, disordered and delayed digestion, especially when painful, tends to interfere with sleep rather than promote it, and the same is true of hunger. When, however, the stomach, especially after one has undergone much bodily fatigue, receives a large quantity of food, this determines an access of blood to the digestive organs to secure their functional activity, and the brain is left relatively anæmic. This explains the after-dinner nap of well-fed people on Hammond's theory that sleep is always *due* to cerebral anæmia, while Brunton suggests that the lassitude and drowsiness, so apt to follow a full meal, may be properly regarded as a mild form of auto-intoxication due to the absorption of an excess of the normal digestive products.

VI. *Diabetes.*—It would be foreign to our subject to enter into a full consideration of diabetic coma. In many of these cases its development is either very sudden or is preceded by symptoms referable to the stomach or lungs or by headache, delirium, and difficulty of breathing. In some, however, as laid down by Tirard, it may be preceded by weakness, fainting, and somnolence, coma gradually supervening. Da Costa emphasizes the rapid weak pulse and the absence of palsies as characteristic of the disease, the diagnosis being confirmed by examination of the urine. The odor of apples in the breath is also often distinctive. Osler considers that we have not yet the data for a rational explanation of the symptoms, but quotes with approval the theory of Stadelmann, Külz, and Minkowski that β-oxybutyric acid is the exciting cause of the coma. "It is a decomposition product resulting from disintegration of the tissue albumins."

VII. *Obesity.*—The occurrence of drowsiness in the obese may be explained on several grounds: by the overloading of the blood current, by an excess of the products of an imperfect digestion, by cerebral inactivity which is apt to belong to such persons, and by relative feebleness of the heart and dilatation of the abdominal arterioles.

VIII. *Insolation.*—Drowsiness can hardly be called a common symptom in heat exhaustion, this condition being often marked by depression, restlessness, and even delirium, while in true sunstroke we have unconsciousness, it is true, but speedily passing into a coma.

IX., X., and XI. The states of drowsiness attributable to these causes, viz., *cerebral anæmia and hyperæmia, cerebral tumors and cranial injuries,* also *exhausting diseases,* may well be grouped together. A condition of cerebral anæmia is assigned by writers as the direct cause of drowsiness arising under various conditions and in different parts of the system. Sometimes cerebral tumors and cranial injuries will, by pressure or otherwise, so disorder the local circulation as to cause a hyperæmia in one part of the encephalon and an anæmia in another. Sometimes the blood contains an excess of carbon dioxide or other poisonous constituents which act as narcotics, and at other times it is rendered degenerate by excessive hemorrhages or by chlorosis (Gueneau de Mussy, quoted by Boyer), so that practically an anæmia is produced. Thus Gasquet argues "whether the blood sent to the brain be diminished in quantity or contains an excess of CO_2, the supply of new material and the removal of that already used would alike be impeded. This is seen in the drowsiness following healthful exertion, if not extreme." He explains, on the theory of a direct spasm of intracranial arterioles or of a dilatation of vessels in other parts of the body, thus leaving those of the head relatively empty, the drowsiness with sleeplessness of hysterical subjects and of some cases of insanity, as well as the drowsiness following exposure to extreme cold and that observable in the idle and aimless, whose brains are ever inactive. I may also quote in support of the same view the following from Germain Sée: "The fatigue and somnolence which precede sleep are an instinctive warning of a conservative character against the danger of overdoing." It is to be noted, however, that there is not entire agreement among writers as to the etiology of this morbid drowsiness any more than we found to be the case in regard to normal sleepiness. Thus Dana says: "Most cases of morbid somnolence are closely related to the epileptic or hysterical diathesis." Also under the name of *cataphora* or *sopor*, Boyer describes "a morbid sleep which differs from true sleep in that it does not answer to the need of sleep. It is observed under the same conditions as coma, when the causes are less intense. Fevers, poisonings, large losses of blood, and nervous exhaustion also lead to cataphora."

XII. *The Sleeping Sickness of Africa.*—The morbid entity or entities included under this title exist not only on the West coast of Africa, where they were first observed, but have been observed in the French island of Martinique, in Cuba, in New South Wales, and even in Paris (Guérin) in a few instances, but only among negroes of African birth. The characteristic features are that the disease attacks negroes, that there is a progressive somnolence, with emaciation and a fatal termination. There are a marked ptosis, puffiness of the face, and enlargement of the glands of the neck, together with muscular tremor and an absence of fever, the patient having a sense of coldness even when lying in the sun. Evidently the symptoms of other diseases, such as meningitis, typhoid fever, and certain skin affections have been confounded with those of this disease in some reported cases. Its etiology remains unsettled. Da Costa and others consider it to resemble beri-beri, while Manson, regarding it as a filariasis, ascribes it to *Filaria perstans.* He refers to a case believed to have been cured by the use of arsenic. As a prophylactic, he urges care about the drinking-water.

Besides cases which would be readily referred to one of the classes enumerated above, the writers in the medical journals are constantly giving histories of unexplained or unclassified cases in which drowsiness or increasing somnolence is the most prominent symptom. Many such are associated with chorea, hysteria, or hystero-epilepsy, others with severe neuralgias, with malarial poisoning, or follow upon exhausting illness or hemorrhages. Thus William T. Gairdner tells of a girl suffering from chorea, suspended during sleep, who had a peculiar somnolence together with normal sleep. She was intelligent and generally healthy. The abnormal sleep occurred suddenly and was interrupted only by calling her name loudly, when she at once awoke and went on with what she had been doing. L. N. Sharp reports the case of an old woman of eighty-two, who after the supposed passage of gall-stones, slept for nearly three weeks, being gradually more easily aroused and sleeping less and less till she finally recovered strength and appetite.

Morison cites a case in which deep and unexplained drowsiness set in, accompanied by cyanosis. There was subnormal temperature with a weak and flabby heart, without abnormal sounds. Albuminuria one-twelfth. The patient became extremely feeble so that he could not walk, but was cured in three weeks by daily massage, after digitalis, tonics, purgatives, and corrected diet had failed.

R. Caton tells of increasing somnolence in a man otherwise healthy except for some psoriasis. He improved under out-of-door farm work with a restricted diet and intestinal antiseptics. The diagnosis was that his trouble was due to auto-infection.

R. Matas reports persistent tendency to sleep in a young woman with a malignant tumor of the brain, which gradually caused anæmia by its increasing pressure upon the cerebral mass; also a case of cervico-dorsal neuralgia accompanied by stupor, which finally yielded to tonics and anodynes.

Finkler writes in "Allbutt's System of Medicine" that somnolence, sometimes increasing to coma, is occasionally observed in the beginning or course of influenza. The clinical picture resembles cerebro-spinal meningitis that has not fully developed. It is always accompanied by fever, which distinguishes it from the coma of diabetes.

After directing attention to these various systemic causes of pathological drowsiness, we must not overlook such as are certainly very common, but not on that account to be forgotten, viz., the various narcotic drugs, most of which are in daily use. Do not fail to come to the rescue of the drowsy and half-starved baby whose wet-nurse is masking her own deficiencies with frequent doses of soothing syrup or paregoric administered to her charge, nor to refer to their proper cause the apathy, the coated tongue, and the eruptive skin of the anæmic woman whose friend has recommended "a little bromide" to help her to sleep. The *drunken* man may be very drowsy, he may also be apoplectic or have a fractured skull, so that finding an alcoholic smell about his breath does not complete the diagnosis, as many an ambulance surgeon has realized to his cost. Da Costa points out that he is likely to have a frequent pulse, usually dilated pupils, injected conjunctivæ with no lateral deviation of the eye, and that there is often violent struggling. In *opium* poisoning, on the contrary, there are contracted pupils, calm, slow breathing, the drowsiness tending to pass into coma. In this class of possible causes of drowsiness should also be remembered *chloral*, which gives a flushed face with weak and intermittent heart action, while *chloroform*, *hydrocyanic acid*, and *nitrobenzol* all give a characteristic odor to the breath, the first also a quick and tumultuous heart action, such as accompanies stertorous breathing, muscular relaxation, and anæsthesia. *Hydrocyanic acid* poisoning, when not immediately fatal, is said to produce a peculiar disturbance of breathing, with short inspiration and prolonged and labored expiration. It seems hardly necessary to do more than mention, as drugs that may be responsible for drowsiness, *cannabis indica* with its hallucinations, its exaltation, and its abolition of the sense of distance and of time, *hyoscyamus*, with its dryness of throat and dilated pupils, and the many new drugs, such as *sulphonal*, *paraldehyde*, *hydrate of amylene*, and *chloralamide*.

Under the head of *treatment* it seems necessary to enter but little into details, for this condition which we have been considering is in most instances but a symptom of some pathological state, the diagnosis of which will point the way to its treatment. In the case of *diabetes*, however, the onset is sometimes so sudden and the danger from coma so great that the threatening drowsiness should be energetically dealt with, and Tirard mentions the methods based upon the theory of attempting to oxidize the products which might otherwise form diacetic or oxybutyric acid. With this object the inhalation of oxygen has been employed; also ozone dissolved in water with the addition of 2.5 per cent. of sodium hypophosphite, or a solution of hydrogen peroxide may be given internally. The intravenous injection of hot normal salt solution, however, he thinks the most hopeful, on the theory that the solution helps to dilute the toxic agent in the blood. In the hysterical sleeping girls various authors report success from the use of tartar emetic, while Dana warns us that in some cases, as in a neurasthenic patient of his own, food had to be given through the stomach tube. In the anæmic we must make use of arsenic, of iron, of moderate open-air exercise, perhaps of stimulants, and, in cases in which the heart is weak, of diuretics, including digitalis, and perhaps purgatives. Gasquet gives the caution that "in drowsiness from cerebral tumor or thrombosis it is doubtful if we should attempt to relieve it by medicine. Probably it prolongs life by giving rest to the diseased organ, and it would be rash to act by drugs on diseased vessels."

J. Haven Emerson.

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DRUG HABITS. See *Cocaine, Opium, Chloral,* and *Insanity.*

DUBLIN, N. H.—The most elevated village in New Hampshire (between 1,500 and 1,600 feet), is situated in the southwestern part of the State, 85 miles from Boston. Although not in the White Mountain district, Dublin has a greater elevation than any resort in that region, Bethlehem being the highest with an elevation of 1,459 feet. The town lies at the base of Mount Monadnock, 3,186 feet, near which is Lake Monadnock, and possesses unusual beauty of scenery. The roads, which are good, afford charming drives. The characteristics of the climate are the purity of the air and its tonic qualities. Below are the meteorological data so far as they are obtainable:

METEOROLOGICAL DATA OF DUBLIN, NEW HAMPSHIRE.

(Temperatures in Fahrenheit scale.)

1893.	Maximum.	Minimum.	Mean of maximum and minimum.	Clear days.	Partly cloudy.
January	45°	− 14°	15.5°	13	3
February	45	− 10	17.5	13	5
March	53	1	27.0	11	9
April	61	17	39.0	12	5
May	85	32	58.5	14	5
June	86	44	75.0	10	7
July	84	46	65.0	18	9
August	86	47	66.5	16	9
September	72	37	54.5	12	6
October	70	23	46.5	10	3
November	58	11	34.5	10	5
December	51	− 8	21.5	12	7

There is no record of relative humidity, but it probably does not differ very much from that of Bethlehem, which for July, August, and the first half of September for five years was 65.8 per cent. There are frequent strong west winds, but fogs are rare.

The usual summer range of temperature is from 68° to 75° F.; the maximum, exceeding 80°, is reached perhaps once or twice in the summer. The nights are always cool. The dryness of the air is marked.

There is one first-class hotel, and there are several boarding-houses, though the predominant mode of life is the cottage one; and comfortable, even luxurious houses can be rented. There are Unitarian and Episcopal churches, also a good public library. Dublin has now become an established summer resort, and possesses many fine private residences.

The attractions are the charming excursions in the country about, mountain climbing, driving, boating, bathing, fishing, tennis, golf, and the usual social life of a large summer community. The water supply is excellent and the drainage good. The soil is sufficiently porous to absorb quickly the water after rain. The subsoil is a mixture of clay and gravel. From its elevation, from the purity and dryness of the air as well as its tonic qualities, the climate of Dublin is a favorable one for pulmonary tuberculosis. The climate is recommended also for bronchitis, gout, rheumatism, neurasthenia, insomnia, cardiac indolence, and general depression of health. From personal experience the writer can testify to the purity and exhilarating quality of the air and the beauty and charm of the scenery. In the early autumn, when the leaves are coloring and the air is crisp, outdoor life is a delight, and riding or walking along country roads affords a constant succession of delightful views.

Edward O. Otis.

DUBOISIA.—The leaves of *Duboisia myoporoides* R. Br. (fam. *Solanaceæ*). This is a large shrub or small tree of Australia and some neighboring islands. As the drug occurs in commerce, it is usually broken up into a mass of fragments, mostly from an eighth to a half-inch in length. These are brownish, smooth, and slightly shining. When entire, the leaves are from three to four inches in length by from half an inch to one inch in breadth, and are lanceolate, narrowed toward both ends, and have an entire margin. They have a very slight narcotic odor and a bitter taste. They are not very largely used, but there is a small steady demand for them, for the same uses as those of stramonium or belladonna. The alkaloids are accompanied by some resinous matter, and the accounts of them have been very contradictory. It is now generally recognized that "*duboisine*," the principal one, is identical with *hyoscyamine* in composition and action. It has been used as a substitute for atropine in eye practice, and the drug is the equivalent, in action, use, and dosage, of belladonna.

D. Hopwoodii von Mueller, or "pituri," of Australia, contains an alkaloid, *piturine* ($C_{12}H_{16}N_2$), closely resembling nicotine. The powdered leaf is smoked like tobacco, and is said to be stimulating and supporting, like coca, kola, and other drugs. *Henry H. Rusby.*

DULCAMARA. See *Bittersweet.*

DULCIN ($C_6H_4NH_2.CO.NH.OC_2H_5$).—Sucrol, Valzin, Paraphenetol carbamide, Para-ethoxy-phenyl urea. It may be made from paraphenetidin by the action of potassium cyanate, but preferably by acting upon paraphenetidin with phosgene dissolved in toluol, the product being treated with ammonia. It occurs in colorless, shining needles soluble in 800 parts of cold water, 55 of boiling water, 25 of alcohol, and freely in ether. Having about two hundred times the sweetening power of cane sugar, Riedel employs it to replace the latter in the diet of diabetics. It is also used to sweeten bitter or otherwise unpleasant pharmaceutical preparations.

W. A. Bastedo.

DUNCAN SPRINGS.—Mendocino County, California.

POST-OFFICE.—Hopland. Hotel and cottages.

ACCESS.—Viâ San Francisco and Northern Pacific Railroad to Hopland station.

The new hotel is located on a picturesque knoll, half a mile from the station. The springs are found on a hill 250 feet above the valley and 1,000 feet above the sea level. The surrounding country is of a rough, broken character, and the climate salubrious. The flow of water from the principal spring, the Duncan, is one gallon and a half per minute. There are several other springs,

known as the "Seltzer," the "Iron," the "Borax," and the "Sulphur" springs, their names indicating in a general way their character. The following analysis by A. W. Thatcher shows the mineral ingredients of the principal spring:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Magnesium bicarbonate	90.11
Magnesium chloride	1.41
Magnesium sulphate	1.64
Calcium bicarbonate	15.64
Silica	6.94
Potassium bicarbonate, Sodium bicarbonate	2.37
Total solids,	118.11

Free carbonic acid gas, 36.57 cubic inches.

The waters are said to be much sought after in the treatment of rheumatism, dyspepsia, and constipation.

James K. Crook.

DUODENO-CHOLECYSTOSTOMY. See *Gall-Bladder.*

DUPUYTREN'S CONTRACTION. See *Hand and Fingers.*

DYNAMOMETER.—The word dynamometer, derived from *δύναμις*, force, strength, and *μέτρον*, a measure, is used to denote an instrument for measuring strength or force. This may be either mechanical, muscular, or even physical. As applied to medical science, however, dynamometers are used chiefly in two ways: (1) To determine and regulate the strength of forces applied to the human body; (2) to measure the amount of strength or force which can be exerted by the human body, or various portions thereof, under various conditions. More particularly are these instruments used to determine the force of contraction of certain muscles, or groups of muscles, as the flexors of the fingers and thumb in measuring the force of the grasp of the hand, or of the muscles concerned in pushing or pulling in different ways. Less commonly they are susceptible of employment in determining resistances in which not only the muscles but the firmer and more solid parts of the organism are involved.

The earliest direct attempt to estimate the human strength for scientific purposes seems to have been made by De La Hire, who in 1699 published his "Examen de la Force de l'Homme," in the "Memoirs of the Academy of Sciences" at Paris. He determined the strength of men from their ability to lift weights and carry burdens, and compared it with that of horses.

The first instrument, however, which was directly used for this purpose, and to which the name of dynamometer was given, was invented by an Englishman named Graham; but it did not obtain notoriety until attention was drawn to it by Desaguliers, who in 1719 published his work on "Experimental Philosophy." The latter was a Frenchman by birth, but came early to England, and was made professor at the University of Oxford. He modified Graham's machine in various ways, and thus produced a machine of his own.

His machine, or rather machines, because different ones were required to test different muscles, consisted practically of a large wooden frame and stout uprights to afford points of support or resistance, and handles attached to a crossbar which moved a steelyard. By hanging weights on the latter the force used could be directly determined. Desaguliers decided from his investigations that five Englishmen were equal in strength to a horse, while it required seven Frenchmen or Dutchmen to furnish the same force.

These instruments were, however, too unwieldy and cumbersome to be used outside of the laboratory, and being also somewhat expensive they fell rapidly into disuse and were forgotten. Meanwhile Leroy, like De La Hire, a member of the French Academy of Sciences, proposed an instrument which consisted simply of a metallic tube, within which was placed a spiral spring with an attached graduated rod terminating above in a globe. This was to be grasped by the hand, and the spring compressed from above, the amount of force exerted being marked on the rod.

In 1807 Régnier first described his dynamometer. This consisted principally of an elliptic spring of metal, to which was attached a dial furnished with two rows of figures and with two hands, one for each row. The dial was so arranged that the hands were moved by any change in the form of the spring, and the force of either tension or pressure could be easily measured. The two rows of figures corresponded to the effects produced by action on the instrument according as the force was applied in the direction of the long or in that of the short axis; the upper row in myriagrams corresponding to the former, the lower row in kilograms to the latter. This instrument was the first dynamometer of practical value, and most of those in present use are more or less varying modifications of the same type. As may easily be understood, it served not only to measure force as connected with the human frame, but also the strength of machines, and the forces exerted or applied by them. It was first employed in surgery by Sédillot about 1836. He used it to determine and regulate the amount of force exerted in reducing dislocations and in other surgical operations. For this purpose the instrument was attached to one of the cords which extended from the pulley to the limb of the patient, and the measure of the force exerted was read from the dial. Sédillot used the dynamometer of Régnier, but the needles worked in a somewhat different manner. Instead of serving to mark the result of forces according as they were applied in the direction of the long or of the short axis, in this instrument one of the needles simply marked the *maximum* variation, while the other was freely movable and corresponded in position with the amount of the traction at each given moment, thus enabling the operator to recognize variations and to provide for continuous steady action. "He thus succeeded in producing continued extensions, that is to say, those maintained at the same strength and gradually and regularly increased."

None of the dynamometers thus far used appear, however, to have been simple or readily capable of application to medical purposes. In 1859 Burq first published his description of a new *pocket* dynamometer, "formed of the metals most active in metallotherapy." This was to serve, first, for the ready exploration of the strength of pressure and of traction in all the muscular systems of external life; secondly, for the closely approximative determination of the forces which the surgeon may be called upon to use, as in the reduction of certain dislocations; thirdly, for the more usual metallotherapeutic investigations.

Burq's dynamometer (see Fig. 1670) consists simply of a small box or case of metal, rectangular and open in front. Its upper and lower portions are, when it is not in use, maintained at a slight distance from the point of complete closure by a double spring of steel, which is so placed in the interior as to be always perfectly protected. This records accurately, on a dial placed in the centre of the case, the force of all efforts which may be made, directly or indirectly, with the hands or the feet, to close the case. When it is desired to test the force of traction, the hooks represented in the figure are inserted into openings made for them in the top and bottom of the case, and the traction is exerted by means of the handles which are attached to them below.

Another important modification in the form of dynamometers was that introduced by Duchenne, of Boulogne, and apparently first described in 1863. A little later he speaks of it thus: "I have had made a powerful dynamometer (measuring from 1 to 100 kgm.), and a sensitive dynamometer (measuring from 1 to 8 kgm.). The powerful one serves to measure the force of the pressure of the closed hand, that of all movements of parts, and the amount of what I have called nervous excitability (*irritabilité nerveuse*), or the degree of exhaustion of this excitability. First, we measure the force of pressure