

## Part Four.

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### HYDRIATIC PRESCRIPTION MAKING.

A CLEAR conception of the nature of disease is the first essential in the building of a hydriatic prescription and in searching for therapeutic indications. To say that disease is disharmony, a morbid state, a perverted vital activity, is merely to say that when a man is sick, he is not well. In a condition of health the body is not only in a state of ease and comfort, but possesses the ability to maintain itself in such a state. This faculty which the body possesses of maintaining a physiological equilibrium, of resisting the encroachments of microbes and other enemies, is termed vital resistance. This most important factor is always to be taken into consideration in formulating a rational prescription.

The diseased body heals itself by precisely the same processes by which it maintains itself in health. Napoleon recognized this fact when once he protested against the polypharmacy of his day, exclaiming, "Life is a fortress. Why throw obstacles in the way of its defense? Its own means are superior to all the apparatus of your laboratories."\* To say that the thoroughly well man never falls sick, is not a paradox. The morbid manifestations or pathological states which are commonly known as disease, either acute or chronic, result not only from the recognized immediate or exciting cause, but from a lessening of the natural resistance to disease, or the innate ability to keep well. For example, typhoid fever, as Bouchard has shown, chooses for its victims persons whose stomachs have lost the power to destroy the typhoid bacillus which thus finds entrance to the intestines, and finding there a favorable habitat, rapidly grows and produces the series of morbid processes which constitutes the

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\*Emerson's Essays.

clinical picture of typhoid fever. Cholera germs, likewise, are unable to develop in the healthy alimentary canal, but only obtain a permanent footing in the body when the stomach has been weakened by indigestion or subacute gastritis. The tubercle bacillus is not able to establish itself in the thoroughly healthy organism, but thrives in the body which is rendered a favorable soil for this parasitic organism by errors in diet, neglect of exercise, and other unhygienic habits.

The rational treatment of disease requires first of all the removal of causes. The second step is to stimulate and regulate the normal physiological activities. This is the essential particular in which rational medicine differs from empiricism and the artificial method, the evils of which were so well pointed out by Dr. Jacob Bigelow, of Boston, half a century ago. When the body is in a disordered state, it is evident that it is far better to restore the physiological equilibrium by removal of the disturbing element or by encouraging those physiological activities which constitute the normal defenses of the body, than simply to antidote or neutralize one disorder or disturbance by creating a counter-disorder, or in other words, as suggested by the famous Baron Liebig, to undertake to cure one disease by producing another. There are of course conditions under which such measures may be commendable, but only as a last resort for relief of pressing symptoms which do not yield to other measures, or in cases recognized as incurable, and in which only palliation can be expected.

**The Natural Defenses of the Organism.**—The natural meth- 1471  
ods by which the body resists disease must be clearly understood. First of all is the blood, of which Holy Writ declares, "The blood is the life." The nerve supply of a part may be destroyed,—a limb, for example, may have lost entirely both sensation and power of motion, yet its life is maintained through the fact that the living blood is still circulating through its vessels. Cut off the blood supply, and even though no other injury be done to the limb, death will

speedily occur. The blood is not only the source of life, but is the great healing agent of the body.

In disease, the blood carries oxygen directly to the part in which the life-battle is being fought, whereby the cells engaged in the conflict are stimulated and sustained while the accumulated poisons are burned, or are carried away by the serum with which the tissues are bathed. Through the control of the general blood movement and of the local blood supply, hydrotherapy is capable of influencing almost every morbid process.

One of the most remarkable and useful methods by which the body defends itself against morbid processes is that known as phagocytosis, in which the white corpuscles of the blood destroy or remove from the circulation disease-producing microbes of various sorts which may find entrance.

The destruction of germs is also carried on in the body by other cells than the white corpuscles of the blood. The spleen doubtless possesses the power of attenuating parasitic organisms, even though they may not be entirely killed. The lymph glands wage a fierce and often successful battle against the encroachments of microbes of various sorts. It is this fact which gives rise to the rapid enlargement of the lymphatic glands in the vicinity of an infected part. The same enlargement and increase of activity of the glands and other structures usually takes place after removal of the spleen. Various cells lining the nasal cavity and the alimentary canal are able to destroy microbes of many sorts, and thus to protect the body from disease.

The destruction of poisons by the liver, by the thyroid gland, the suprarenal capsules, and doubtless by other structures, is a most important and admirable method of automatic defense, which is of the highest value in both health and disease; but in certain forms of disease, especially in acute infectious fevers, it is indispensable to the saving of life.

As pointed out by Charrin, the alkalinity of the blood plays a most important part in the defense of the organism, both in

ordinary health and disease. A lowering of the alkalinity of the blood diminishes the activity of the leucocytes, lessens the energy of the normal reflexes, diminishes the promptness and energy of those manifold reactions upon which so many of the life processes depend. The alkalinity is lowered in various diseases, especially in fever, in rheumatism, gout, diabetes, and in many cases of indigestion. This lessening of the alkalinity is always accompanied by lowered vital resistance. This is well shown in the frequency with which skin diseases, gangrene, cataract, and various other affections due to lowered resistance occur in diabetes. Milch cows are not infrequently subject to diabetes, and when in this condition, suffer more than usual from phlegmon.

The thyroid and perhaps other glands not only destroy poisons, but act as general regulators of nutrition through the internal secretions formed. These secretions produce various physiological effects, as vaso-dilatation and stimulation of the spinal cord.

The kidneys aid in the defense by eliminating poisons, especially those resulting from the oxidation of proteids. The suprarenal capsules are active in destroying certain poisons. The liver purifies the blood by removing the alkaline wastes, and forming urea from uric acid and other more highly toxic substances.

The skin plays a very important part in defending the body, not only in acting as a non-conductor and a regulator of the bodily temperature, but by opposing the entrance of germs, and by maintaining the various interesting reflex activities whereby the internal machinery of the organism is kept in motion.

**General Indications.**—The general indications for the employment of hydriatic procedures which are encountered in the management of different acute and chronic maladies, may be enumerated as follows:—



*Activities to be Encouraged.*

1. General vital resistance.
  - a. Destruction of toxins.
  - b. Elimination of toxins.
  - c. Destruction and elimination of bacteria.
2. Oxidation.
3. The functions of the automatic and reflex centers.
4. General and local metabolic processes, blood formation, glandular activity, etc.
5. Cardiac activity and general blood movement and local blood supply.
6. Heat production.
7. Heat elimination.

*Activities and conditions to be diminished, combated, or mitigated.*

1. Nervous irritability.
2. Bacterial growth.
3. Blood movement and volume.
4. Exaggerated metabolism.
5. Heat production.
6. Heat elimination.

In addition to the above indications which are drawn chiefly from a study of the etiology and pathology of disease, we may find through a study of the clinical history, course, complications, and termination of various chronic and acute diseases, a great number of special indications for the employment of both palliative and curative measures. Many of these have already been indicated in the section on "Therapeutic Effects," to which section the reader is referred to avoid unnecessary repetition here.

To deal exhaustively with each one of these several indications would require an extensive volume. We will undertake to present in the briefest manner possible only the most useful facts in relation to the use of hydriatic measures in meeting these several important indications.

**1472      Procedures for Increasing Vital Resistance.**—Vital resistance, as Charrin has suggested, is a property of the individual

cells. To increase the vital resistance, the energy and activity of the cell must be increased. Hydrotherapy affords a most excellent means of accomplishing this in the application of cold water to the cutaneous surface. It is generally conceded that the increase of vital resistance is one of the greatest advantages presented by the Brand bath (1150) in the treatment of typhoid fever and other infectious diseases. The Brand bath is not applicable, however, to all cases in which it is necessary to increase vital resistance. Fortunately, there are numerous procedures whereby vital resistance may be increased which differ sufficiently in form and intensity to make possible the most complete adaptation of the therapeutic means to the requirements of every case. The most useful of these procedures are elsewhere named in the order of their intensity (1625).

There are various partial or mixed procedures of greater or less value as a means of increasing the vital resistance through their exciting or tonic effects, of which the following may be especially mentioned: The wet-sheet pack (1179), the wet girdle (1347), the chest pack (1373), the rubbing sitz (1309), alternate sponging of the spine (1342), the alternate spinal compress (1340), cold water drinking (1426), the small cold enema (1405).

Any of these tonic procedures may be preceded by a short hot application as a preparation for the cold procedure, but the hot application must be very brief and the cold application must be prolonged sufficiently to produce the dominant effect. It must be remembered, however, that cold is primarily a depressing agent, and hence applications intended to increase the vital resistance must be very brief, and must be promptly followed by reaction. The lower the temperature, if the duration is short, the more highly tonic the effect of the application (632). Nearly every case of chronic disease requires cold applications of some sort twice a day, even if nothing more intense than the cold mitten friction (1209). In cases of fever, cold applications, such as the cold mitten friction (1209), or the cold towel rubbing (1213),

should be applied every three or four hours, unless a cold bath of some other sort, such as the wet sheet pack (1179) or the Brand bath (1150), has been administered.

The principal ways in which the body resists the encroachments of disease are, (a) destruction of toxins, (b) elimination of toxins, (c) destruction and elimination of bacteria.

**1473**     *a. Procedures Which Encourage Destruction of Toxins.—*

All procedures which encourage vital resistance, at the same time encourage the destruction of toxins by stimulating the toxin-destroying cells of the thyroid gland, the liver, the spleen, the lymphatics, and other tissues. The efficiency of these organs is also increased by the increased rate of blood movement which always follows tonic cold applications. The hepatic douche (1096) and the splenic douche (1097) increase the activity of the two largest glands in the body, while the general cold douche (1010) powerfully stimulates all the bodily activities by which destruction of toxins is promoted.

**1474**     *b. Procedures To Encourage the Elimination of Toxins.—*

In observations made upon rabbits some seven or eight years ago, the writer demonstrated that the perspiration of the ordinary healthy man contains toxic substances in such quantity that from 100 to 120 c.c. of the liquid collected from the surface of a sweating man, is, when injected intravenously, capable of killing a rabbit weighing one kilogram. It has been shown that in epileptics the toxicity may be enormously increased. In one case of this disease, 20 c.c. of the sweat thrown off during a paroxysm was found to be sufficient to kill a rabbit weighing one kilogram. Bouchard has also shown that certain poisons are thrown off by the skin. Hence eliminative baths (642-659), especially the electric-light bath (1250), the sweating wet sheet pack (1179), and the vapor bath (1246), are valuable means for encouraging the elimination of toxins resulting from bacterial action or perverted metabolic processes. The kidneys, liver, and bowels are the most important outlets for toxic substances. The liver disposes of alkaline wastes, the kidneys remove

urea, also uric acid and other products of deficient oxidation, while a variety of poisons find their way out through the intestines.

c. Water can not be employed in such a way as to act directly as a germicide; but by increasing the alkalinity of the blood, and especially by increasing leucocytosis and the activity of the lymphatic glands and other organs capable of destroying bacteria, the encroachments of these enemies of life may be successfully opposed. 1475

The observations of Metchnikoff and others have shown clearly the importance of leucocytosis as a means of combating bacterial infection. By the regulation of the local blood movement and volume, leucocytosis may be encouraged to almost any desired degree. Winternitz, Thayer, Thermes, and numerous others have shown the enormous influence of the general cold bath in producing general leucocytosis (383). By means of the heating compress (1344) frequently renewed, and the alternate compress (1340), local leucocytosis may be encouraged to a marvelous extent, and most admirable results in utilizing the natural defenses of the body may be secured. This fact has been demonstrated in multitudes of cases in the management of pneumonia, typhoid fever, and other maladies in which the pathological process is circumscribed and due to micro-organisms.

The most effective procedures for encouraging leucocytosis are the heating compress or pack (1344), the alternate compress (1340), the Scotch douche (1037), and the alternate douche 1044). The elimination of bacteria by the skin and kidneys is encouraged by sweating baths (1239-1250), copious water drinking (1423), and especially by the vapor bath (1246), the sweating pack (1191), and the prolonged neutral bath (1130), each followed by the cold mitten friction (1209), the cold towel rub (1213), or some other cold procedure.

**Procedures Which Increase Oxidation.**—Strasser and others 1476 have shown that the application of the cold bath increases the absorption of oxygen and the elimination of CO<sub>2</sub> (402),

and it is evident that general oxidation is thereby increased throughout the body. By the employment of hot baths in such a way as to elevate the body temperature, the oxidation of proteid substances is increased (567). We are thus in possession of means by which either the oxidation of carbon—in other words, the burning up of sugar or fat—or the oxidation of nitrogen, and the more perfect combustion and elimination, through conversion into urea, of uric acid, creatin, creatinin, and other proteid wastes, may be effected at will.

Cold applications for the purpose of increasing oxidation should be general in character, or at least should be sufficiently extensive to lower the body temperature a few tenths of a degree, in order to develop the reaction necessary to increase heat production, and consequently consumption of the carbonaceous elements. More prolonged baths, such as the dripping sheet (1217), rubbing shallow (1174), cold immersion (1114), plunge (1108), and the cooling pack (1189), are the measures most effective for stimulating oxidation of fat and carbohydrates.

The hot immersion bath (1126), the heating pack (1197), the dry pack (1192), the vapor (1246), hot air (1233), and Turkish baths (1239), sun bath (1254), and especially the electric-light bath (1250), are the most efficient means of stimulating nitrogen oxidation. By means of these measures the body temperature may be elevated a few tenths of a degree, or even three or four degrees, according to the duration of the bath. These general hot applications should always be followed, as has been elsewhere pointed out (644), by a very short general cold application, to counteract the depressing effects of the hot bath, and to restore the tone of the skin.

- 1477      Procedures Which Excite the Central Ganglia.**—In adynamic fevers, in many neurasthenic states, in cardiac failure, hypopepsia, renal insufficiency, and various visceral congestions, general or localized excitation of the central ganglia

is clearly indicated. This may be admirably accomplished by various hydriatic procedures, especially by very cold, very hot, or alternate hot and cold applications. The alternate general douche (1044), percussion or alternate spinal douche (1342), alternate spinal sponging (1342), alternate spinal compresses (1340), alternate immersion (1113), with all the various forms of cold (1318), alternate (1340), and hot and cold localized compresses (1356), are most efficient means of exciting the central ganglia.

**Measures Which Encourage General and Local Metabolic Processes.**— In most forms of chronic diseases, there is either primarily or secondarily a grave disturbance of the general nutrition, arising from failure of the tissues to maintain normal metabolism. The failure may be either general, as in some forms of autointoxication, or local, as in hypopepsia. In both classes of cases, hydrotherapy furnishes efficient and potent measures which may be relied upon to awaken the sluggish organs to normal activity, provided the integrity of their tissues has not been too extensively damaged. This may be accomplished by the same measures which have been mentioned above as capable of increasing vital resistance, and stimulating the central ganglia. Tissues to which applications may be directly made are most quickly excited by hot applications; as, for example, when it is desired to produce cutaneous activity, the results may be most quickly secured by a general hot bath of some sort. The best and most permanent effects are produced, however, by somewhat prolonged hot applications followed by a brief cold application. The most effective means of stimulating visceral activity is by applying to the related skin area a short cold douche (1070) with strong pressure, the alternate douche (1044), the alternate (1340) or the heating compress (1344). These measures also increase blood formation and glandular activity, as elsewhere shown (383-388, 390-399).

That general cold applications to the cutaneous surface promote to a high degree the processes of blood formation,

is well shown by the efficiency of the cold bath in combating the most inveterate forms of anemia, even when all other measures have failed. It is certainly safe to say that there is no known remedy of such great value in promoting blood formation as short general cold baths. The lower the temperature, the better, but the application must be very short. The cold mitten friction (1209) and the cold towel rub (1213) applied two or three times daily are especially valuable for this purpose. For patients who have been trained up to its use, the cold douche (1010) is most effective of all.

- 1479 Procedures Which Increase General Blood Movement and Local Blood Supply.**—By the regulation of the general movement of the blood, all the nutritive processes of the body may be influenced. Since the blood is the great healing agent of the body, measures whereby the movement of the blood throughout the body may be encouraged or controlled are of the greatest importance in dealing with both acute and chronic diseases of almost every sort. Cold applications to the surface excite the heart, increase the blood pressure, and increase the movement of the blood and lymph throughout the body. All tonic measures may be used for this purpose. The cold precordial compress (1383) serves a like purpose, and may be employed in many cases when general cold applications may be inadmissible, and also when hot applications are required for some other purpose, thus antagonizing the depressing effect of heat. The cold mitten friction (1209) and the cold towel rub (1213) are especially useful in reinforcing the energy of the heart and encouraging the circulation in almost all cases in which these indications are present, whether in cases of fever, cardiac or renal diseases, or in cases of neurasthenia with general feebleness, and in chronic tuberculosis and other wasting disorders.

General hot applications at first stimulate the heart and increase blood pressure, but later lower the blood pressure (1025), diminish the energy of the heart, and lessen the rate of the movement of the vital fluids. Hot applications are

seldom required for this purpose, though the neutral bath (1130) is sometimes useful in quieting excessive activity. It is important to bear this fact in mind whenever it is thought necessary to employ hot baths in cases in which there is pronounced cardiac weakness, so that excessive or prolonged general hot applications may be avoided. Being thus forewarned, it is also possible to guard against cardiac failure by the application of the cold precordial compress (1183) during the hot application. This is very often necessary in the administration of the vapor bath (1246), the electric-light bath (1250), and especially the Russian (1243) and hot immersion baths (1126), in cases of cardiac disease.

Cold applications first quicken and then slow the action of the heart, raise the blood pressure, and increase the movement of the blood and the lymph through their proper channels in all parts of the body (298-316, 1256-1292).

**Measures Which Increase Heat Production.**—That cold 1480 applications to the skin promote heat production has long been recognized as a thoroughly established fact (290). The processes of thermogenesis, or heat production, are brought into play through the impression of cold upon the thermic nerves of the skin. The more intense and prolonged this impression, the greater the effect in increasing heat production. The most intense effects are produced by prolonging the application until the temperature of the body has been slightly lowered. If the application of cold is greatly prolonged or is repeated at short intervals, the thermogenetic reaction fails, and the depressant effects of cold appear (417).

**Measures Which Increase the Elimination of Heat.**— 1481 Increased heat elimination is indicated in nearly all cases of fever, as it has been shown by Winternitz (1164), that in febrile disorders the elevation of temperature is due less to increased heat production than to decreased heat elimination. The measures most essential are such as will maintain active cutaneous circulation, while at the same time cooling the skin. This may be accomplished by vigorous



rubbing in a cold immersion bath,— the so-called Brand bath (1150), — by the rubbing wet sheet (1216), the wet-sheet pack (1179), very short hot applications followed by short cold applications to the surface, the cold friction bath (1209), the cold towel rub (1213), cold water drinking (1426), cold enema (1405), cold applications to the spine (1372). In certain cases the hot-blanket pack (1197), the hot evaporating sheet (726), and various other measures, may be usefully employed (744, 745).

**1482 Measures Which Relieve Pain and Nervous Irritability.—**

Nervous irritability and pain may be most successfully combated by hydiatic applications, which are not only successfully directed to the removal of the cause, but also act efficiently in palliation. The measures most useful for this purpose have been discussed elsewhere. See 693, 644. Also 1130, 1031, 1318, 1351, 1355, 1344, 1328. The general neutral bath (1130) and the neutral douche (1031) are marvelously efficient in relieving nervous irritability, and inducing sleep, not only in chronic forms of insomnia, but the neutral bath or pack in the delirium and vigil of acute fevers. The moist abdominal bandage (1351), cool head-cap (1371), and in certain cases the heating spinal compress (1355) are equally useful. The hot fomentation (1328) and the heating compress (1344) are as useful in relieving localized pain and diminishing local irritability, whether cutaneous or visceral, as are cold applications in arousing activity in sluggish parts. The cold compress (1318) and the ice compress (1314) are likewise useful in relieving pain in superficial parts to which these applications may be made directly.

**1483 Measures Which Combat Bacterial Development.—**

The development of invading bacteria in cases of infection may be delayed by prolonged applications of cold, when it is possible to make the application directly to the parts involved. When deeper parts are affected, the growth of parasites may be combated by increasing the alkalinity of the blood by means of general cold applications (388), and by

the application of measures which have already been described as favoring local leucocytosis, such as the frequently renewed heating compress (1344), and the alternate compress (1340). These measures, by increasing the movement of the blood through the affected parts, bring constantly into contact with the growing bacteria fresh supplies of alexins and antitoxins, whereby their growth is discouraged, while at the same time the white cells are actively engaged in capturing and destroying the parasites. 1484

**Means of Controlling Blood Movement and Volume.—**

Stasis of the blood and lymph encourages morbid processes by favoring the development and the accumulation of waste and toxic substances in the tissues, thus leading to perverted metabolism or unhealthy tissue formation, and by weakening the resistance of the cells, which become asphyxiated by the accumulation of  $\text{CO}_2$  and poisoned by their own excretions, so that they are unfitted for combat with the invading parasites.

The same measures which have been described as encouraging leucocytosis may be successfully employed in combating stasis of the blood in inflamed or congested parts. Derivative measures (682), the cold compress (1318) over the affected viscus, Scotch douche (1037), and revulsive measures (680) of all sorts are indicated. See also 1256 to 1292. 1485

**Measures Which Lessen Heat Production.—**Heat production, which must be discouraged in febrile states, is best inhibited by short hot applications to the surface, and by prolonged or frequently repeated cold applications. The short hot immersion bath (1126), the hot-blanket pack (1197), fomentations to the spine (1328), the hot evaporating sheet (726), and the short hot immersion (1126) are the best means of applying heat for this purpose. The graduated bath (1120), the prolonged tepid bath (1123), ( $88^\circ$ ), and the cooling pack (1189) are the best cold applications for diminishing heat production (744).

**Measures Which Lessen Heat Elimination.—**It is seldom 1486

necessary to discourage heat elimination, except in cases of syncope, in which the dry pack (1192), the hot-blanket pack (1197), the hot enema (1406), and hot water drinking (1429) are efficient means of preventing excessive heat loss, and an aid to nature in accomplishing the end which it is sought to gain, by contraction of the peripheral vessels. When hot applications are made, great care must be taken to avoid exposing the patient during the changing of the application or after it has been removed. It is wise to alternate the hot application by a short cold application, with friction, vigorous cold wet-hand rubbing (1213), and cold mitten

1487 friction (1209). See 752.

**General Metabolic Activity Is Diminished**, first of all, by maintaining absolute rest in bed. The neutral bath (1130) is an efficient measure for the same purpose. In cases of hypopepsia, intestinal, uterine, and vesical catarrh, overexcitation of the secreting glands may be lessened by withdrawing the blood from the part by various derivative measures (667-682, 1286-1291).

1488 **Hydriatic Incompatibilities.**—Wise discretion must be used in the combination of procedures, lest one measure shall undo the therapeutic work accomplished by another. The combination of hydriatic processes in such a manner as to enable one procedure to intensify or to prolong the effect of another is perhaps the best test of a physician's experience and skill. The following meager suggestions barely touch the surface of the subject.

1. Tonic procedures must be carefully avoided when a sedative effect is desired, such as cold and neutral baths or other measures. The tonic application may be accidental. The contact with pure cold air after a neutral bath, or of the feet with a cold floor, may destroy the sedative effect of the bath altogether.

2. Sedative measures must be as carefully suppressed when tonic procedures are employed for their specific effects. When a hot bath precedes a cold bath, if too prolonged, or

if the cold application is too short, or if the patient is exposed to an overheated atmosphere after the bath, the tonic effect will be lost.

3. In the use of antipyretic measures, the procedures must be so managed that heat production will not be increased so much as to more than counterbalance the increase in heat elimination; hence, short cold or cool applications may be injurious. Cool sponging often raises the temperature by increasing heat production.

#### THE ADAPTATION OF HYDRIATIC PRESCRIPTIONS TO INDIVIDUAL DISEASES.

In the study of individual diseases with reference to the making of a hydriatic prescription, we must first of all consider in each case what are all the therapeutic indications present or likely to be present in the case in hand. The information sought will be found by carefully studying, first, the etiology of the disease; second, its pathology; and third, its clinical history, including the clinical course, complications and possible terminations and sequelæ.

#### TYPHOID FEVER.

The hydriatic treatment of typhoid fever may be taken as a type and model for the treatment of all acute infectious fevers, although each presents special indications to which attention will be called.

##### *Etiological Indications.*

1. **Prevent Further Introduction of the Bacillus.**—Boil the drinking water, or administer only distilled or other water known to be free from micro-organisms.

2. **Suppress the Growth in the Intestine of the Specific Bacillus and Putrefactive Organisms.**—Withhold all solid food, and food rich in nitrogen. Especially avoid meat extracts, broths. Give fruit juices and fruit purées, and dextrinized or predigested cereals, as zwieback, granola, grānut, syrupy malt extracts.

##### *Pathological Indications.*

3. **Combat the Local Morbid Process in the Intestine.**—  
(a) Pay thorough attention to indications especially as regards

a dietary which will not furnish a favorable nutrient media for the growth of the bacillus. Administer a coloclyster (1404) at 75° to 80° twice daily, placing the patient in the right Simm's position so as to insure a complete evacuation of the entire colon.

(b) Avoid irritating foods and drugs, especially purgation, mercurials, and salines.

(c) Increase the local resistance by the cold abdominal compress (1318) changed every ten to twenty minutes, rubbing the surface until red whenever the compress is changed. The compress should be employed through the entire course of the disease. It should never be allowed to remain sufficiently long to produce heat accumulation.

(d) Relieve local congestion and pain by applying fomentations (1328) to the abdominal surface, or the hot trunk pack (1197) for ten minutes every three hours, and by taking care to maintain the activity of the cutaneous circulation by frequent rubbings and proper covering in connection with the cold compress. See that the hands and feet are kept warm, if necessary by hot hand (1302), or foot baths (1297), or by warm wrappings and hot-water bottles.

4. **Increase and Sustain General Vital Resistance.**—Employ the cooling pack (1189), the graduated bath (1120), the prolonged neutral bath (1130), the Brand-bath (1150), the cold enema, (1405), and other rational antipyretic measures. See 711 to 745. The cold mitten friction (1209), cold towel rub (1213), or cold wet-sheet rubbing (1216) in bed should be employed systematically three or four times daily for general tonic effect.

Water drinking (1423), to the amount of 4 to 8 pints daily, half a glass an hour, counting liquid food. Water may be administered by enema (1404) when not readily swallowed.

5. **Energize the Heart and Blood-Vessels and Facilitate General Blood Movement.**—The cold bath, especially when accompanied by friction, increases the energy of the heart and the activity of the peripheral vessels. The cold mitten friction (1209), the cold towel rub (1123), and the Brand bath (1150), are most effective. Cold friction should be applied whenever the surface is blanched and cold or cyanotic. When the spasm of the blood-vessels is pronounced or the circulation feeble, precede the cold application with a short hot application, hot affusion (1103), large hot fomentations (1328), or hot sponging (1204). Apply

the cold precordial compress (1383) and the ice-bag (1314) over the heart for fifteen minutes at intervals of two to four hours.

6. **Prevent Wasting of the Muscles and the Tissues.**—Complete mental and physical rest. See also 4.

**Clinical Indications.**

The clinical symptoms of this disease are wonderfully mitigated by the application of those measures which are required to meet the etiological indications as presented before. There are various palliative measures, however, which may be employed for the relief of special symptoms, and as means of preventing various complications and sequelæ, and which may be employed with great advantage. Special indications also arise from variations in the type of the disease, in mixed infections, etc. The indications presented by the leading symptoms of the disease are as follows:—

7. **Headache.**—Cold compress (40° to 60°) to the head (1371) and face. Wet the hair thoroughly, and renew the compress before warmed. If the pain is very severe, apply the ice-bag or ice compress to the head (1315), and ice-collar (1316) or ice compress to the neck (1314); the hot and cold cephalic compress (1358) for ten minutes, the cold compress during the interval. Sponge forehead and neck with very hot water. Shampoo scalp with fingers dipped in cold water.

8. **Pain in the Neck.**—Fomentations (1328) applied for 3 minutes followed by the heating compress (1344), changed every 15 minutes. Repeat the fomentation hourly.

9. **Nose-Bleed.**—Ice to the back of the neck (1314); very hot compress to the face (1286); ice to the hands (1302); hot foot bath (1297); very hot nasal douche (1397). Compression of soft parts of nose against bone.

10. **Cough.**—Fomentation to the chest (1328) for 5 minutes. Heating compress (1344), changed every 2 hours or hourly, when temperature is above 102°. Continue so long as bronchial catarrh exists.

11. **Foul Tongue and Sordes.**—Cleanse the mouth with dilute peroxide of hydrogen or hydrozone, 1 to 6, four times daily. Mois-

ten the mouth frequently with cinnamon water. Keep the tongue moist by a mass of cotton placed between the teeth moistened frequently with cinnamon water, made by adding ten drops of cinnamon essence to half a glass of boiled water.

12. **Constipation.**—Copious coloclyster (1407) at 75°, twice daily, followed by enema, one pint at 70°; oil enema.

13. **Diarrhea.**—Copious coloclyster (1407) at 95° after every evacuation of the bowels; hot enema (105°) (1406), two or three pints followed by cold (70°) one pint. Cold abdominal compress (1318) at 60°, changing every half-hour; hot leg pack (1393), if extremities are cold. An exclusive diet of fruit juices for a day or two.

14. **Tympanites.**—Very hot fomentation (1328) for 5 minutes, followed by cold compress (1318), changing every 15 minutes. Coloclyster (1407) at 75° to empty colon. Yellow soap may be added to the water, if necessary. This symptom is rarely troublesome under hydriatic treatment.

15. **Fever.**—Cooling pack (1189); graduated bath (1120); prolonged tepid bath (1123) 88°; Brand Bath (1150); cold towel rub (1213); cold mitten friction (1209); large cold compress (1318); cooling enema (1405); cooling bath when temperature rises about 101.5°. See 703-765.

a. **High Temperature with Hot Dry Skin.**—Cooling pack (1189); graduated bath (1120); Brand bath (1150); prolonged tepid bath (1123). See 744.

b. **High Temperature with Cold Skin.**—Hot-blanket pack (1197), 5 to 10 minutes, followed by cooling pack (1189); hot full bath (1126) 3 minutes, followed by graduated bath (1120); fomentation to spine (1328) or hot enema (1406), followed by cold mitten friction (1209). See 745.

16. **Insomnia.**—Prolonged neutral bath (1130) at 92°-95°, neutral wet sheet pack (1182); cold compress to head (1371); hot foot (1297) or leg pack (1393) when legs are cold.

17. **Delirium.**—Ice-cap (1323); ice-collar (1316); alternate sponging (1206) or compress to upper spine (1340); prolonged tepid bath (1123), 88°, 1 to 4 hours; cooling pack (1189), three to five changes, last application prolonged to heating stage; hot foot (1297) and hand bath (1302), if extremities are cold; cooling enema (1405) every 3 hours.

18. **Coma.**—Cold towel rub (1213); cold mitten friction (1209); prolonged neutral bath (1130); wet-sheet pack (1179); alternate spinal compress (1340); cooling enema (1405) every 3 to 4 hours; alternate spinal compress (1342).

*Complications are due to special localized manifestations of the disease, chiefly either to secondary infection of the bacillus itself or to intense local action of the toxins.*

19. **Gastric Irritation.**—Large fomentations over the stomach or around the body (1328), for 20 minutes. Repeat every 3 hours. Cold compress (1318) at 60°, renewing every 15 minutes, during the interval; hot and cold gastric compress (1362); ice-bag to epigastrium (1316); ice pills, feed by nutritive enemas.

20. **Intestinal Ulcerations.**—Fomentation over the abdomen (1328), 5 minutes every 2 hours, followed by cold compress (1318) at 60°, changing as soon as warmed; hot foot bath (1297) or leg pack (1393).

21. **Intestinal Hemorrhage.**—Withhold food till hemorrhage ceases. Extreme quiet for 2 to 3 days, ice-bag over abdomen (1314), hot foot bath (1297) or hot leg pack (1393). Rectal irrigation with ice-water (1410). After 2 days, a cleansing enema to remove decomposing clots (1404), 75°.

22. **Inflammation of Bile Ducts.**—Large fomentation (1328) over the right side for 15 minutes every 3 hours followed by cold compress (1318) at 60°, changing every 15 minutes during the interval. Water drinking (1423); an exclusive diet of fruit juices and fruit purées for 3 or 4 days; cooling enema (1405) repeated every 3 hours.

23. **Appendicitis.**—Fomentation (1328) for 20 minutes over right iliac region every 2 hours. Cold compress (1318) at 60°, renewed every 10 minutes during the intervals. Hot foot bath (1297) or leg pack (1393) with the fomentation.

24. **Laryngitis.**—Fomentation (1328) to the throat for 10 minutes every 2 hours. Cold compress (1318) renewed every 15 minutes during the interval. Steam inhalation (1419).

25. **Bronchitis, Broncho-Pneumonia, Lobar Pneumonia.**—Fomentation to the chest (1328) for 10 minutes every 2 or 3 hours, followed by cool chest compress (1321) renewing, every 15 to 30 minutes during the intervals. See 1570, 1571, 1498, taking into consideration the patient's condition.



26. **Pulmonary Congestion.**—Alternate compresses (1340) to the chest for 15 minutes, renewed every 3 hours; heating chest pack (1374) during the interval, at 60°, changing once an hour. Rub the chest well at each change. Hot foot bath (1297) or leg pack (1393).

27. **Cardiac Failure.**—Cold mitten friction (1209) whenever the skin is cold or cyanotic. Avoid the Brand bath and extreme general cold baths. Lower temperature by cold mitten friction (1209), graduated bath (1120), prolonged tepid bath (1123); ice-bag over heart (620, 1314) for 15 minutes at intervals of 2 hours. (Avoid in endocarditis.) Hot fomentations (1328) over the heart for ½ minute followed by cold compress for 10 minutes when cold alone is not sufficiently stimulating.

28. **Endocarditis—Pericarditis.**—Hot fomentation (1328) for 30 seconds followed by ice-bag (620, 1314) to be taken off and parts rubbed till red every 15 minutes. Repeat the fomentation hourly, if necessary to relieve pain.

29. **Myocarditis.**—Fomentation (1328) 30 seconds, followed by compress (1314) at 60°, 15 minutes. Repeat hourly or every 2 hours. General cold friction (1209). Avoid the cold immersion bath and general cold applications.

30. **Arteritis and Phlebitis.**—Fomentation (1328) for 15 minutes every 2 hours. After each fomentation apply a heating compress (1344) or a dry cotton poultice (1388) to remain until the next fomentation. Complete rest of the affected parts.

31. **Mania.**—Neutral wet-sheet pack (1182); prolonged neutral bath (1130), 92° to 95°; cold to the head and neck.

32. **Meningitis.**—Hot-blanket pack (1197); ice-cap (1323); ice-collar (1315); ice-bag to spine (1372); hot immersion bath (1126), 103°, 2 to 5 minutes, followed by wet-sheet pack (1179) with ice-bag (1323) to head and ice compress (1314) to neck during bath. The wet-sheet pack should be prolonged in the heating stage (1183). Prolonged neutral bath (1130). Copious enema or colocylyster once or twice a day (1407).

33. **Apoplexy.**—Cold compress (1314) to the head and neck; hot leg pack (1393) for 30 minutes every 2 hours; dry pack to legs (1192) during intervals; brief application of cold friction (1209); catheterization of bladder (1411).

34. **Hysteria.**—Hot-blanket pack (1197) followed by neutral wet-sheet pack (1182); ice to head (1314) and spine (1372); cooling enema (1405).

35. **Neuritis.**—For general neuritis, prolonged neutral bath (1130) 1 to 3 hours, twice daily. Water drinking (1424), copious cooling enema (1405), hot-blanket pack (1197), 15 minutes, followed by heating pack (1183). For local neuritis, fomentation every 2 hours, with heating compress during interval, or revulsive compress for 5 to 10 minutes every hour or two.

36. **Multiple Sclerosis.**—Fomentation to the spine (1328) every 3 hours; followed by heating spinal compress (1344) renewing every 30 minutes during the intervals; prolonged neutral bath (1130); cold friction (1209); warm enemas (1406); cooling enema (1405) at 75° three times daily.

37. **Contractures.**—Fomentations to spine (1328) and affected parts followed by heating compress (1344).

38. **Periostitis.**—Fomentation (1328) to the affected part for 20 minutes repeated every 3 hours; continuous heating compress (1344) during interval.

39. **Arthritis.**—Fomentation (1328) for 15 minutes every 3 hours; heating compress (1344) during interval, changing hourly or more often when the local temperature is high.

40. **Abscess of the Muscles.**—Fomentation (1328) for 10 minutes every 2 hours followed by continuous heating compress (1344) at 60° during the interval. Prevent general septicemia by prolonged neutral baths, copious water drinking, large enemas twice daily, and early opening and antiseptic treatment.

41. **Suppurating Kidney.**—Fomentation for 10 minutes over the kidney, repeating every 2 hours; continuous heating compress (1344) during interval; revulsive compress every 3 hours (1341); irrigation of bladder (1411).

42. **Orchitis.**—Fomentation (1328) for 20 minutes every 2 hours followed by the cooling compress (1318) extending over the hypogastrium and inside the thighs; hot pelvic pack (1390) for 15 minutes every 3 hours; hot foot bath (1297); ice-bag (1372); take care to maintain vigorous surface circulation.

43. **Ovaritis.**—Hot and cold pelvic compress (1364); ice-bag

over ovary, removing for 5 minutes every half-hour, with hot leg pack (1393); keep the extremities warm.

44. **Pelvic Hematocele.**— Hot pack to the hips (1389) and legs (1393 and 1197), 10 to 20 minutes; repeat every 2 to 3 hours; ice-bag over tumor during intervals. After first 24 hours, revulsive compress (1341) three times daily; hot rectal (1410) or vaginal irrigation (1413) twice daily; fomentation (1328); hot enema (1406).

45. **Acute Nephritis, Albumin in Urine.**— Hot-blanket pack (1197) continued, if possible, to vigorous perspiration; repeat (1314) every hour. Ice-bag over heart during pack. Hot full-bath (1126) 103° to 105° for 6 minutes, followed by neutral bath (1130) 92° to 94° for 1 to 2 hours; fomentation to back (1328) for 20 minutes every 2 hours; heating compress (1344) applied at 60° during intervals; enema (1404) at 92° three times daily; small ice-bag (1314) over lower third of sternum, remove for 5 minutes every half-hour; copious water drinking (1423).

46. **Scanty Urine.**— Enema (1405) at 80° every 4 hours; copious water drinking (1423) from 1 to 2 pints every 4 hours, employing carbonated distilled water if possible; may add fruit juices, but avoid cane sugar, which causes tympanitis; small cold compress (1318) or ice-bag (1314) over sternum; fomentation (1328) over the loins for 15 minutes every 3 hours, well-protected heating compress during intervals.

#### ***During Convalescence.***

47. **Subnormal Temperature.**— Fomentation to the spine (1328) accompanied by cold mitten friction (1209); dry pack (1192). Hot enema (1406); hot water drinking (1429); warm flannels and hot water bottles.

48. **Cardiac Weakness.**— Cold (60°) precordial compress (1383), 15 minutes, 3 times daily; cold mitten friction (1209) or cold towel rub (1213) twice daily.

49. **Palpitation of Heart.**— Cold precordial compress (1383) or ice-bag (1314) over heart; may be relieved by the use of the stomach-tube (1401), if due to retained, undigested food stuffs; enema (1404) if bowels distended.

50. **Lack of Appetite, Hypopepsia.**— Fomentation (1328) over the stomach for 5 minutes followed by ice-bag (1314) half an

hour before eating; wet girdle (1347) worn at night; cold mitten friction (1209) or cold towel rub (1213) twice daily.

51. **Anemia.**—Graduated tonic treatment (1625), twice daily. Out-of-door life; nitrogenous diet.

52. **General Weakness.**—Alternate spinal sponging (1342) or compresses (1340) twice daily, followed by cold mitten friction (1209) or cold towel rub (1213) twice a day; massage (1221, 1461); manual Swedish movements.

#### **Complications.**

53. **Boils, Phlegmons, and Bed-Sores.**—Scrupulous cleanliness of the skin; hot soap bath twice daily; dependent parts, the axilla, groins, nares should be smeared with laundry soap, which should be allowed to remain for 10 minutes; apply alternate compress (1340) to parts subjected to pressure for 15 minutes twice daily; the parts should be carefully masséed (1221, 1461), taking care to avoid abrading the surface; pimples should be dressed antiseptically. Hot fomentation (1328); neutral compress (1339); ice-bag or ice compress (1314).

54. **Ataxo-Adynamic State.**—Hot full-bath (1126) for 5 minutes followed by cold affusion (1103) for 3 minutes at 75° to 73°; the affusion should be followed by vigorous rubbing. Hot full-bath (1126) 104° to 105° followed by cold affusion (1103), 75° to shoulders, head, and spine, the patient being held in sitting position during the affusion. The affusion should begin with two pails, increasing in number to 6, adding one at each application if effects are satisfactory. Ice-bag (1314) over heart 10 minutes every 2 hours. Prolonged neutral bath (1130), 92° to 95°, rubbing gently if inclined to chill; gradually lower temperature to 88°; continue for several hours. A general cold friction (1209); ice-bag to the spine; fomentations to the spine (1328), or hot-blanket pack (1197) followed by cold friction (1209).

55. **Typhoid in Infants.**—Graduated bath (1120); prolonged neutral bath (1130); cooling pack (1189); continuous abdominal compress (1351); cooling enema (1405). Avoid Brand bath.

56. **Typhoid in Aged Persons.**—Graduated bath (1120); prolonged neutral bath (1130); cooling pack (1189); cooling enema (1405); cold friction (1209) over heart and chest every 3 hours, heating compress (1344) between. Special attention

should be given to the administration of water by the mouth and by enema (1404). Avoid Brand bath.

57. **Typhoid with Puerperal Fever.**—The prolonged neutral compress (1339); graduated bath (1120), avoiding temperatures lower than 80°. Cooling pack (1189); hot-blanket pack (1197), followed by cold towel rub (1213) or cold mitten friction (1209); hot pelvic pack (1390); hot enemas (1406); hot uterine irrigation (1415); hot vaginal irrigation (1413); cold precordial compress (1383) or ice-bag (1314) over heart; fomentation (1328) over abdomen 5 to 10 minutes every 2 to 3 hours; heating compress (1344) applied at 60°, renewing every 20 minutes during the intervals.

58. **Typhoid with Pregnancy.**—Prolonged neutral or tepid bath (1130); cool enemas (1405); cold towel rubs (1213); cold friction (1209). Wet-sheet pack (1179); abdominal compress (1318). Avoid Brand bath.

59. **Typhoid with Erysipelas.**—The same measures as in ordinary typhoid, adding ice-cold compress (1314) to inflamed surfaces, changing every 15 minutes; fomentation (1328) for 5 minutes every 2 hours; after 24 hours, cooling compress (1318) to the inflamed parts, changing every 20 minutes. As inflammation diminishes prolong the intervals (1344).

60. **Typhoid with Diabetes.**—Prolonged tepid bath (1123); cooling enema (1405); fomentation to spine and abdomen (1328) followed by neutral pack (1182); cold mitten friction (1209); cold towel rub (1213).

61. **Typhoid with Obesity.**—Cooling pack (1189); cold mitten friction (1209); cold towel rub (1213); revulsive compress (1341) to the chest twice daily; cooling enema (1405); lightly covered chest compress (1377) changed every 2 hours.

62. **Typhoid with Influenza.**—Hot foot bath (1297) followed by heating pack (1183) continued to sweating (1187) if possible; hot leg packs (1393); prolonged neutral baths (1130, 1182). Short hot immersion bath (1126), with cold to the head, followed by prolonged neutral bath (1130). Cold compress to head. See also indication 28.

63. **Typhoid with Tuberculosis.**—Neutral bath; cold towel rub (1213); chest compress (1344) changed every 2 hours. Avoid Brand Bath.

64. **Typho-Malarial Fever.**—Short hot immersion bath (1126) or hot-blanket pack (1197) followed by short cold pail douche (1103), spray (1055), shower (1047), or percussion douche (1035) followed by dry pack (1192) just before chill begins. During the chill the douche may be administered best as pail pour (1103), patient sitting in tub; when temperature is high, cooling pack (1189), cooling enema (1405), cold abdominal compress (1318). Treatment the same as for ordinary typhoid.

65. **Contraindications.**—The following measures are to be avoided: prolonged hot applications, short cold applications, vigorous friction; and in cases complicated with myocarditis, hemorrhage, and perforation, avoid the Brand bath, affusion, and all disturbing procedures. The same measures are to be avoided also in cases complicated with nephritis, pelvic hematocele, meningitis, appendicitis, pneumonia, bronchial pneumonia, multiple neuritis, spinal meningitis, arthritis, and ovaritis, diabetes, obesity, or tuberculosis, in infants and aged persons.

**General Method.**—Antipyretic measures should begin at the earliest possible moment without waiting to make the diagnosis absolutely certain. Vigorous measures at the outset will shorten the duration of the disease, greatly diminish its intensity, lessen the danger of a fatal issue, and abbreviate the period of convalescence. If the patient is first seen after the temperature has reached a high point ( $103^{\circ}$  or  $104^{\circ}$ ), most vigorous hydratic measures should be employed at once to bring the fever under control if possible. As the disease advances, milder measures, such as the neutral bath (1130), the graduated bath (1120), the rubbing wet sheet in bed (1216), and repeated wet towel rubbing (1213) are the measures indicated. During the first few days of the fever (3 to 7 days) the diet may consist exclusively or nearly so, of natural fruit juices,—unsweetened grape-juice is best; later, gruels prepared from heat-dextrinized cereals (1630) or malted preparations (1631) should be employed in addition.

By a careful study of the above paragraphs it will be noted how many different indications are met by a single simple hydratic procedure, as for example, the abdominal cooling compress.

**MALARIAL FEVER—REMITTENT. INTERMITTENT.****1490 Etiological Indications.**

1. **To Suppress Infection.**—Boil drinking water, and if necessary and possible remove to a salubrious locality. Avoid mosquito bites.

**Pathological Indications.**

2. **Increase General Resistance.**—Tonic hydiatic applications, especially the wet-sheet pack (1179); cold mitten friction (1209); cold towel rubbing (1213); wet-sheet rub (1216); half-bath (1174); cold douche (1010); cool colocyler daily (1407); copious water drinking (1423). The vigor of the applications must be suited to the patient's condition (1625). Repeat two to three times daily during remission or between the paroxysms.

3. **Increase General Leucocytosis as a Means of Destroying the Parasites.**—The hot bath followed by vigorous cold applications, —hot-blanket pack (1197) followed by cold towel rub (1209); vapor bath (1246) or electric-light bath (1250) followed by cold douche (1010) or wet-sheet rub (1216); hot-blanket pack (1197) followed by cold douche (1010) or shallow bath (1174); sweating bath (832, 1191) followed by wet-sheet rubbing (1216).

4. **Combat Hepatic and Splenic Enlargement.**—Fomentations (1328) or the revulsive compress (1341) over the liver and spleen three times daily, followed by the heating compress (1344) be worn during the intervals.

5. **Interrupt Malarial Paroxysm or Periodicity.**—The hot bath (1126) followed by a short very cold douche or affusion (1103), with vigorous rubbing followed by dry pack. (1192). Apply an hour before the chill and repeat in half an hour. Approach of chill is indicated by rise of temperature.

6. **Combat Anemia, Changes in the Blood and Organic Changes and Degenerations of the Liver, Spleen, and Other Viscera.**—Copious water drinking (1424) to eliminate the poisons; cold applications as indicated for increasing vital resistance; hot baths followed by cold douches or affusions (1103); sweating pack (1191) followed by wet-sheet rub (1216); enema, 70°,

(1404) or coloclyster (1407) twice a day; careful feeding; easily digestible foods, especially well-dextrinized cereals and fruits.

**Clinical Indications.**

7. The indications for the treatment of continued malarial fever are almost identical with those for the treatment of typhoid. The typhoid state is not infrequently present. The abdominal compress (1351) is as useful in combating lesions of the liver and spleen in the remittent or continued forms of malarial infection as in typhoid.

In the intermittent form special attention is given to suppression of the chill and less to the employment of antifebrile measures.

8. **Fever.**—The temperature rises higher than in typhoid. The cooling pack (1189) is especially indicated. The cooling enema (1405), graduated bath (1120), rubbing wet sheet in bed (1216), cold towel rubbing (1213), and cool sponging (1204) are indicated. Water drinking (1424). In intermittent fever care must be taken to avoid precipitating a chill by cold applications, which should not be made until all tendency to rigor has disappeared.

9. **Chill.**—The prevention of the paroxysm, or interruption of the periodicity of the disease is of the highest importance in intermittent malarial fever. The best measures are the sweating pack (1191), or the very hot immersion (1126) or shower bath (1054), 3 to 5 minutes, followed by a very cold douche or affusion (1103), and this followed by vigorous rubbing (920), and the dry sweating pack (1192). When the chill occurs, give the patient hot water to drink, wrap in warm blankets, place bags filled with hot water, or heated bricks, to the sides and loins. Avoid hydropathic applications of all sorts. Moistening of the skin causes chill by evaporation.

10. **Sweating.**—Wipe with a soft cloth, taking care to avoid too much exposure of the body. If the sweating is greatly prolonged, sponge the surface with very hot (1204) water. Make no cold applications while the patient is sweating.

11. **During Interval.**—If intermittent, on well day administer a sweating bath followed by cold wet-sheet rub (1216) and other vigorous tonic measures. A fomentation (1328) should



be applied over stomach and liver, morning and night. The wet girdle (1347), without impervious covering, should be worn constantly and changed just before becoming dry, or three or four times daily.

12. **Mixed Infections: Typho-Malarial Fever, Malarial Dysentery, and So-called Malarial Pneumonia.**—Should be treated especially with reference to the primary or most prominent disorder. See Dysentery (1530), Pneumonia (1498), Typhoid (1489).

13. **Hematuria.**—Continuous rest in bed; hot-blanket pack (1197) for 30 to 40 minutes, followed by cold mitten friction (1209), twice or more times daily, administered so as to avoid chilling. The skin must be well reddened and very active cutaneous circulation maintained. Ice-bag (1314) over sternum during interval; withdraw ice-bag for 5 minutes every half-hour to allow reaction to occur. Fomentation (1328) to back for 15 minutes every 2 hours followed by well-protected heating compress (1344). Between fomentations (1328), maintain vigorous surface circulation by hot-water bags, etc.

14. **Syncope.**—Hot-blanket pack (1197) for 15 minutes, followed by very cold and vigorous friction (1209), and wrapping in warm, dry blankets. Hot fomentation over heart 1 minute followed by cold friction to the chest 2 or 3 minutes, repeated every hour or more if necessary. Hot water drinking (1429); hot enema (1406). Induce sweating if possible by fomentation to spine and over liver (1328). After a few minutes follow by general cold friction (1209).

15. **Convulsions.**—Heat to back (1335) with ice to head (1314), or hot immersion bath (1126) with ice cap (1323); copious water drinking (1424) and hot enema (1406). After the bath, wrap the patient in dry blankets.

16. **Malarial Enlargement of Liver and Spleen.**—Alternate compress (1340) or alternate douche (1044), over liver and spleen; wet girdle (1347) to be changed every 4 hours.

17. **Malarial Cachexia.**—Electric-light bath (1250), vapor bath (1246), hot-blanket pack (1197), or sweating wet-sheet pack (1187), followed by tonic cold applications suited to the patient's condition, once daily, as cold mitten friction (1209) or towel rubbing (1213), wet-sheet rub (1216), half bath (1174) or douche (1010) once or twice daily; fomentation

(1328) over the liver twice a day with heating compress (1344) during the interval; water drinking (1424); an aseptic dietary.

18. **Complications.**—These are for the most part similar to those of typhoid fever and require the same treatment.

**General Method.**—In cases of intermittent malarial fever the first object to be gained is the interruption of the paroxysm. If the patient's system is greatly deteriorated and his blood corpuscles greatly diminished in number, either by the long continuance of the malarial disease, or some pre-existing malady, the vital resistance may be in nearly all cases sufficiently developed by means of simple hydiatic procedures, carefully administered as above described, to interrupt the paroxysm without the administration of a medicinal agent of any sort. If, however, after one or two thoroughgoing attempts to interrupt the paroxysm by hydiatic means, success is not attained, antiperiodic doses of quinia (5 to 15 grains) may be administered. The drug should be given within the six hours just preceding the expected paroxysm. The hydiatic measures recommended for interrupting the paroxysms should also be employed, and between the paroxysms strongly tonic measures should be steadily kept up to fortify the patient against a new attack. These measures should be continued for several weeks after the interruption of the paroxysm. The use of large doses or many-times repeated doses of quinine is never necessary in the treatment of intermittent fever when the resources of hydrotherapy are effectively brought into operation.

In chronic malarial infection, which is often refractory to quinine, hydrotherapy is marvelously successful. See "Malarial Cachexia" (17).

Remittent malarial fever can not be so readily brought to a quick termination as the intermittent form of the disease. The general method is the same as in typhoid fever. When the temperature is high, administer vigorous antipyretic measures, especially the cooling pack (1189); during the remission apply fomentations (1328) over the liver, cold towel rubbings (1213) every two or three hours, and thus build up the patient's resistance. In cases which have resisted antiperiodic doses of quinine, arsenic, and other drugs, a few days' application of hydiatic measures rarely fails to effect a radical change for the better. If hydrotherapy alone proves insufficient, one or two small antiperiodic doses of quinine may be administered with the happiest results.

**SCARLET FEVER.****1491 Pathological Indications.**

1. **Encourage General Resistance.**—Hot-blanket pack (1197), 3 to 8 minutes followed by cooling wet-sheet pack (1189). (The cold sheet should be well heated before removing.) Or, the hot pack (1183) may be followed by cold towel rub (1213), wet-sheet rub (1216) in bed, or tepid affusion (1103), 85° to 80°, the patient sitting in a bath tub. Cold mitten friction must be avoided.

2. **Eliminate Poisons.**—Copious water drinking (1423), two to six glasses in 24 hours. Carbonated water, fruit juice, fruit purées, etc.

**Clinical Indications.**

3. **Fever.**—Cooling pack (1189), hot-blanket pack (1197), followed by cold towel rub (1213) or wet-sheet rub (1216), graduated bath (1120), copious water drinking (1423), cooling enema (1405).

4. **Delayed Eruption.**—Wet-sheet pack (1183) prolonged to heating stage.

5. **Diarrhea.**—Enema (1405), 75° to 80° after each movement. Fomentation (1328) for 15 minutes over the abdomen every two hours, followed by heating compress (1344), changed every half-hour. If the general surface is cold, the hot full-bath (1126) for five minutes, followed by short cold towel rubbing (1213).

6. **Vomiting.**—Hot and cold trunk pack (1367), ice-bag (1314) over the stomach or spine opposite, lavage (1401) if vomiting is persistent.

7. **Convulsions.**—Hot-blanket pack (1197) for 10 minutes, followed by cold wet-sheet pack (1179) with ice to head (1314). Hot bath (1126) for 5 minutes followed by neutral bath (1130) 92° to 95°. Water drinking (1423); large enema (1404).

8. **Pharyngitis.**—Fomentation (1328) to throat 10 minutes every hour with ice compress (1314) during interval. Steam inhalation (1419) 5 to 10 minutes every half-hour. Gargle throat with very hot water hourly. Throat compress (1381) at 60°, changed every 15 minutes; protected heating compress (1344)

changed once in 3 hours. Spray throat with weak solution of peroxide of hydrogen or hydrozone every hour.

9. **Delirium with Insomnia and Nervous Agitation or Chorea.**—Ice bag (1323) to head, hot fomentations (1328) to spine, followed by prolonged wet-sheet pack (1179).

10. **Desquamation.**—Neutral (92° to 95°) alkaline bath daily (1112, 1463), 15 minutes to 1 hour.

11. **Nephritis, or Suppression of Urine.**—Hot-blanket pack (1197) for 20 to 30 minutes followed by heating compress (1344) to the loins. Copious water drinking (1423); enema (1405) 80° to 90°, twice daily.

12. **Pleurisy.**—Fomentation to the chest (1328) for 15 minutes every 2 hours with heating compress (1344) during the interval. Tight muslin bandage about chest if pain is intense.

13. **Rheumatism.**—Sweating pack (1191); copious water drinking (1424); fomentation (1328) to joints every 3 hours with heating compress (1344) during interval.

14. **Pericarditis, or Endocarditis.**—Ice-bag (1314) or cold compress (1314) over heart to be removed for 5 minutes every 15 to 20 minutes.

15. **Enteritis.**—Hot trunk pack (1197), with hot foot bath (1297) or hot leg pack (1393) for 20 minutes, followed by cold abdominal compress (1318) at 60°, to be changed every 30 minutes. Enema (1404) after each stool, at 95°.

16. **Pneumonia.**—Fomentation (1328) for 15 minutes every 2 or 3 hours, cold compress (1344) at 60° during interval, changing every 10 to 20 minutes. Hot hip and leg pack (1393) once or twice daily to relieve congestion. Keep skin warm and active. Hot-blanket pack (1197) if patient is chilly, followed by heating wet-sheet pack (1183).

17. **Enlarged Spleen or Liver.**—Fomentation (1328) over part for 10 to 20 minutes twice daily. Follow by ice water compress, to be changed every 2 hours during interval.

18. **Contraindications.**—Avoid short cold baths, prolonged hot baths, and all other measures which diminish heat elimination or increase heat production.

**General Method.**—At the beginning encourage eruption by hot-water drinking (1429), very hot baths (1126), heating pack (1183).

After eruption is fully developed, cooling pack (1189), graduated bath (1120), cool enema (1405), and other antipyretic measures. Copious water drinking (1426) is especially important.

Give attention to throat, to prevent infection of the ears. Steam inhalation (1419); irrigation (1400); heating compress (1344).

If albumin appears, the blood must be kept in the skin by hot packs (1197) and warm wrappings; and the cold applications must be "partial," such as wet-hand rub (1201), cold mitten friction (1209), cold towel rub (1213).

Prolonged chilling of the skin must be carefully avoided.

### MEASLES.

#### 1492 *Pathological Indications.*

1. **Maintain General Resistance.**—Wet-sheet pack (1179); graduated bath (1120).

2. **Prevent Pulmonary Complications.**—Fomentation to chest (1328) twice a day, chest pack (1373) during interval.

#### *Clinical Indications.*

3. **Naso-Pharyngeal Irritation.**—Apply light very hot compresses (1286) to the face. Inhale steam (1419) and vapors of aromatic oils and balsams. Fomentation (1328) to the throat every 2 hours, heating compress (1344) during the interval, changing every 15 minutes at first, less frequently later.

4. **Headache.** See 1554, 11-15; 1562.

5. **Delayed Eruption.**—Hot-blanket pack (1197) 10 minutes followed by heating wet-sheet pack (1183).

6. **Inflammation of Middle Ear.**—Ice to throat of same side (1314); fomentation (1328) over ear.

7. **Nephritis.** See 1537.

8. **Hemorrhagic Form.**—Hot-blanket pack (1197) or short hot immersion bath (1126) followed by heating wet-sheet pack (1183). Repeat every 3 or 4 hours. Prolonged neutral (1130) bath at 95° to 93°.

9. **Bronchial Catarrh.**—Fomentation to chest (1328), cold towel rub (1213), or cold mitten friction (1209) twice daily. Moist chest pack (1373) night and day.

10. **Lobar Pneumonia — Broncho-Pneumonia.**—Fomentation (1328) for pain and irritable cough, repeated every 2 or

3 hours; cold compress (1344) during interval, at 60°, changing every 15 to 30 minutes; hot hip and leg pack (1197) if the local inflammation is severe. See Pneumonia (1498).

11. **Cough.**— See 1570, 4-7.
12. **Nosebleed.**— See 1496, 4.
13. **Inflammation of the Eye or Eyelids.**— See 1602.

ERYSIPELAS.

1493

**Pathological Indications.**

1. **General.**— Cold mitten friction (1209) or towel rub (1213) every 3 hours.
2. **Combat Local Inflammation and Extension of the Disease.**— Cold compress (1318) during the early stage of the disease, renewing before it becomes warm, later, less frequently. Avoid ice-bags or ice compresses, which involve risk of sloughing; Fomentations (1328) for 2 to 5 minutes every 2 hours. Ice-collar (1316), when the skin of the head or face is affected.

**Clinical Indications.**

3. **Fever.**— Graduated bath (1120); prolonged neutral bath (1130); cooling enema (1405); cooling wet-sheet pack (1179).
4. **Recurring Chills.**— Dry pack (1192); hot water drinking. (1429).
5. **Vomiting.**— Ice-bag (1314) over stomach; hot and cold trunk pack (1367).
6. **Pericarditis, Endocarditis.**— See 1576. Fomentation (1328) over heart 30 seconds, followed by precordial compress (1383) at 60°; change every half-hour.
7. **Myocarditis.**— See 1489, 29; 1576, 5.
8. **Arthritis.**— See 1499; 1489, 39.
9. **Albuminuria, Acute Nephritis.**— See 1537.
10. **Delirium.**— See 1489, 17.

**General Method.**— During the early stage of the disease, while the surface is bright red and the inflammation extending, apply cooling measures, changing every few minutes (3 to 5), as often as warm. Prevent extreme depression by a fomentation (1238), not too hot, every hour or two. When the parts become a dull red color, or the rapid extension is checked, employ the heating compress (1344), changing at intervals of 15 to 30 minutes, prolonging the interval as the fever and inflammation subside.

**SMALLPOX.****1494 Pathological Indications.**

1. **General.**—Spare, aseptic diet (1626); water drinking (1423). See Scarlet Fever (1491, 1).

**Clinical Indications.**

2. **Lumbar Pain.**—Fomentation (1328) or hot trunk pack (1197) every three hours; heating pack (1183) during interval, change every 30 to 40 minutes.

3. **Nausea and Vomiting.**—Ice-bag (1314) over stomach, hot and cold trunk pack (1367).

4. **Constipation.**—Cold enema (1405) daily; coloclyster (1407) 70° daily.

5. **Diarrhea.**—Enema (1404) at 95° after each movement; fomentation (1328) to abdomen; cold compress (1318) to be changed every hour.

6. **Delayed Eruption.**—Hot-blanket pack (1197) or hot bath (1126) followed by sweating wet-sheet pack (1183).

7. **Fever.**—Graduated bath (1120); prolonged tepid bath (1123); cooling wet-sheet pack (1189); cool enema (1405), with simultaneous fomentation (1328) to back if necessary to prevent chill; large cooling compress.

8. **Stage of Suppuration.**—Prolonged or continuous neutral bath (1130).

9. **Tumefaction of Face.**—Hot compress (1286) to face for 5 minutes every hour; cold compress (1318) during interval, at 60°, renewed every 20 minutes.

10. **Pitting.**—Cooling compress, using red cloth, covering face completely. Red curtains to windows.

11. **Headache and Delirium.**—Ice-cap (1323), ice-collar (1316). Hot and cold cephalic compress (1358).

12. **Broncho-Pneumonia.**—See 1576, 5.

13. **Endocarditis.**—See 1573.

14. **Laryngitis.**—See 1568.

15. **Nephritis.**—See 1537.

16. **Inflammation of Eye.**—1602.

17. **Contraindications.**—After the eruption appears, avoid the wet-hand rub, cold mitten friction, and all friction baths.

**General Method.**—Keep the temperature down, and maintain activity of the skin by prolonged neutral (1130) and tepid baths (1123); aid elimination by copious water drinking (1423); prevent visceral complications by continuous cold to the head (1323) and the frequently changed abdominal compress (1318). In confluent cases, general septicemia is prevented by prolonged immersion baths (1136).

### CEREBROSPINAL MENINGITIS.

#### *Pathological Indications.*

1495

1. **General.**—Careful cold mitten friction two to four times daily.

2. **Combat Congestion of the Brain and Cord.**—Ice-cap (1323); ice-collar (1316); cooling coil to the head (1323); ice-bag to the spine (1372). General derivative treatment; hot hip (1389) and leg packs (1393); hot-blanket pack (1197); hot immersion bath (1126) 102°. The head should be protected by the ice-cap (1323), cooling coil, or the ice-collar (1316) during all hot applications. Fomentation to the spine every 2 hours. Spinal ice-bag during intervals. Vigorous cutaneous circulation must be maintained.

3. **Prevent Bronchitis.**—Fomentation (1328) to the chest twice daily; well-protected heating compress (1374) during interval. Keep shoulders dry and well protected while in bed. In cold bath, see that water covers shoulders. The chest compress must cover the shoulders.

#### *Clinical Indications.*

4. **Headache.**—Fomentation (1328) to the back of the neck; ice compress (1314) to head and neck; hot and cold head compress (1358).

5. **Pain in Back and Legs.**—Fomentation (1328) to back; hot hip pack (1389). Repeat every 4 hours or more often. Heating compress (1344) or ice-bag (1314) during interval.

6. **Vomiting.**—Ice-bag (1314) over stomach; hot and cold trunk pack (1367).

7. **Diarrhea.**—Enema (1404) at 95° after each movement. During interval cold abdominal compress (1318) at 60°, renewed every fifteen minutes with fomentations to the abdomen 15 minutes every two hours (1328).



8. **Muscular Rigidity.**—Hot-blanket pack (1197); hot immersion bath (1126); hot fomentation (1328), followed by well-protected heating compress (1344).

9. **Hyperesthesia.**—Neutral bath (1130), 94° to 96°.

10. **Delirium or Mania.**—Prolonged wet-sheet pack (1179); ice-cap (1323) and ice-collar (1316).

11. **Muscular Spasm.**—Hot immersion (1126) 102° for 15 to 30 minutes, with ice-cap (1323) and ice-collar (1316). Prolonged neutral bath (1130). Heating spinal compress (1355).

12. **Contraindications.**—Cold immersion bath, Brand bath, and other general cold procedures.

**General Method.**—The object to be sought by treatment is to relieve congestion of the brain and spinal cord by diverting as much blood as possible into the skin, hence the skin must be kept constantly warm. General cold procedures such as the cold immersion bath and the cooling pack must be avoided. Undue excitement of the brain and cord during hot applications is prevented by protecting these parts by ice compresses (1314) and the application of an ice-bag (1314) over the heart. Partial cold applications, as cold mitten friction (1209), should be administered several times daily to maintain vital resistance, care being taken to maintain surface warmth by the application of heat to the spine and legs (1328, 1393) or other parts during the treatment, so as to avoid retrostasis.

## MUMPS.

### 1496 *Pathological Indications.*

1. **General.**—Cold mitten friction (1209) or cold towel rub (1213) two to four times a day. Neutral bath one hour daily (1130); copious water drinking (1423).

2. **To Combat Local Inflammation.**—Hot-blanket pack (1197) followed by heating or sweating wet-sheet pack (1187), continued 1 to 2 hours. Repeat the application twice a day. Fomentation (1328) over the affected parts every 2 hours for 15 minutes, followed by heating compress (1344) at 60°, to be changed every 10 minutes or as soon as warm; ice-bag over swollen glands until active inflammation is subdued. Remove ice every half hour and apply fomentation for 5 minutes.

**Clinical Indications.**

3. **Headache.**—Cool compress (1314).
4. **Nose-Bleed.**—Ice (1314) to back of neck; hot compress (1286) over face; ice to hands; elevate hands to vertical position; if necessary, hot foot bath (1297), or hot leg pack (1393); very hot nasal douche (1397).
5. **Diarrhea.**—Enema (1404) at 95° after each movement. Abdominal compress (1318) at 60°, renewed every 15 to 30 minutes. If pain is present, abdominal fomentation (1328) for 15 minutes or until relieved, every 2 hours; large hot soap enema to empty colon if due to fecal accumulation.
6. **Vomiting.**—Ice (1314) over stomach or spine opposite, or hot and cold gastric compress (1362); ice pills; sipping very hot water.
7. **Earache.**—Ice bag (1314) to neck of the same side, fomentation (1328) over ear; hot ear douche (1396) if necessary. Protect the ear with warm cotton to prevent chilling by evaporation after treatment.
8. **Convulsions.**—Hot blanket pack (1197) or hot immersion (105° to 108°) (1126) with cold to head.
9. **Inflammation of the Mammæ.**—Fomentation (1328) over the breast for 15 minutes every 3 hours. During interval, heating compress (1344) at 60° renewed every 15 to 30 minutes. Hot pack (1197) to arm of the same side. Hot hip (1389) and leg pack (1393) for derivative effect if pain is severe.
10. **Inflammation of Testicle.**—Ice compress (1314) covering entire genitals and inner surfaces of thighs with simultaneous hot hip (1389) and leg pack (1393) for 30 minutes. Repeat every 4 hours. During interval, heating compress (1344) at 60° in place of ice compress, renewed every 15 minutes.

**DIPHTHERIA AND TONSILITIS.****Pathological Indications.**

1497

1. **Increase and Maintain Vital Resistance.**—Hot fomentation (1328) to the spine or short hot bath (1126), followed by cold mitten friction (1209) or cold towel rub (1213) two to three times a day.

**To Combat Local Inflammation.**—Fomentation (1328) to throat every 2 hours for 15 minutes; ice compress (1314) to throat during interval. If inflammation becomes intense, and suppuration or sloughing is threatened, the heating compress (1344) at 60°, changing every hour. Steam inhalation (1419); antiseptic lotions to throat; hot-water gargle.

**2. Combat General Toxemia and Resulting Degenerations and Localized Inflammations.**—Copious enemas (1404) twice daily. Copious water drinking (1423), three to six pints daily. The free use of fruit juices. Hot fomentations (1328) to the spine or short hot bath (1126), followed by cold mitten friction (1209) or cold towel rub (1213) two to three times a day.

**3. To Combat Local Inflammation.**—Hot-blanket pack (1197) followed by sweating wet-sheet pack (1183); repeat every 3 or 4 hours if necessary. Fomentation (1328) to throat every 2 to 3 hours for 15 minutes; ice compress (1314) to throat during interval; ice pills; if inflammation becomes intense and sloughing is threatened, the heating compress (1344) at 60°, changing every hour. Steam inhalation (1419); antiseptic lotions.

#### ***Clinical Indications.***

**4. Fever.**—Hot-blanket pack (1197) followed by wet-sheet pack (1179); prolonged neutral bath (1130) when rectal temperature rises above 101°; fomentation (1328) followed by cold towel rub (1213); cold enema (1405) with simultaneous fomentation (1328) to the back; hot enema (1406) followed by cold towel rub (1213) or cold mitten friction (1209).

**5. Coma or Collapse.**—Hot-blanket pack (1197); colocyler (1407) at 80°; alternate compress or sponging to spine (1342); cold mitten friction (1209); hot and cold cephalic compress (1358); in case of collapse, short hot immersion bath (1126) followed by dry pack (1192); hot enema followed by dry pack (1192).

**6. Albuminuria, Nephritis.**—See 1537.

**7. Broncho-Pneumonia.**—See 1573.

**8. Paralysis.**—Fomentation to spine (1328) with cold mitten friction (1209); short hot-blanket pack (1197) or electric-light bath (1250) followed by cold mitten friction (1209); hot and cold friction over the affected part; applications of galvanism and

sinusoidal current; gymnastics, massage, and appropriate exercise.

9. **Neuritis.**—Fomentation (1328) over the course of the affected nerve for 15 minutes every 2 to 4 hours; during the interval, the heating compress (1344), well protected. Coloclyster (1407) daily; water drinking (1423), two to four pints; aseptic diet (1626); rest of affected part.

10. **Croup.**—Steam inhalation; inhalation of vapor arising from slaking lime; fomentation to throat 15 minutes every 2 hours; cold or very cold compress, changed every 15 minutes during the interval; hot blanket pack (1197); keep skin warm. Surgical interference is often necessary.

11. **Threatened Suffocation.**—Put the patient in a bath (102° to 105°), and pour cold water over the chest and spine. Cold mitten friction.

#### LOBAR PNEUMONIA.

##### *Etiological Indications.*

1498

1. Exercise special care to prevent pulmonary congestion from exposure of the shoulders or chest to chill by evaporation. Provide the patient with abundance of pure warm air; have a supply of oxygen at hand for immediate use if required.

##### *Pathological Indications.*

2. **Maintain General Vital Resistance.**—Cold mitten friction (1209) or cold towel rub (1213) two to four times daily, after some appropriate heating procedure, as fomentation (1328) to chest or back, hot-blanket pack (1197), or sweating pack (1191).

3. **Combat Local Congestion of the Lungs and Invasion of the Specific Bacillus.**—Fomentation (1328) to the chest before and behind, for 15 minutes every 3 hours. During interval, apply cold compress (1318) at 60°, changing every 15 minutes, or as soon as warmed. Lengthen the period between fomentations, and change the compress less frequently as temperature is lowered, the pain less, and the stage of the disease more advanced. Several ice-bags may be used in place of the cold compress, but the bags should be removed at least every half hour, and the chest should be rubbed until red and warm to maintain surface circulation and skin reflexes. The skin must be kept warm.

4. **Elimination of Poisons.**—Sweating pack (1191) continued

for 2 to 4 hours followed by cold mitten friction (1209) carefully administered. The sweating bath may be preceded by the short hot bath. Copious water drinking (1423). Neutral enema twice daily (1404).

**Clinical Indications.**

5. **Cough.**—Fomentations (1328) every 3 hours; heating compress (1344), changing every 15 to 30 minutes during interval. Steam inhalation (1419) 15 minutes every hour; sipping half a glass of hot water (1429) when inclined to cough; careful protection of neck and shoulders from chilling by contact with wet bedclothing. Keep shoulders covered. Fig. (186.)

6. **Pain in Chest.**—Revulsive compress (1341) covering the whole chest before and behind.

7. **Exudate.**—Alternate compresses (1340) for 20 minutes three times a day, with continuous well-protected heating compress (1344) during intervals after convalescence; for unresolved exudate, alternate fan douche (1061) or alternate spray (1055).

8. **Constipation.**—Daily cold enema (1405) or coloclyster (1407).

9. **Diarrhea.**—Enema (1404) at 96° after each movement; cold abdominal compress (1318), renewing every half hour. Fomentation (1328) every 2–4 hours if pain or tenderness is present.

10. **Tympanites.**—Hot enema (1406) followed by small cool enema (1405); cold coloclyster (1407) with soap; cold abdominal compress (1318) changing hourly.

11. **Gastro-Duodenitis.**—Fomentation (1328) over stomach and bowels or hot trunk pack (1197) every 3 hours. During intervals, cold compress (1318) at 60°, changing every 30 minutes; neutral enema (1404) daily.

12. **Jaundice.**—Large hot coloclyster (1407) at 105°, followed by small cold enema (1405) twice daily. Fomentation (1328) over the liver and stomach every 2 hours. During the interval, heating compress (1344), changing every 30 minutes.

13. **Weak Heart, Feeble Pulse.**—Cold compress (1314) or ice-bag (1314) over the heart for 15 minutes every 2 hours. Cold mitten friction (1209) every 2 hours. Prolonged neutral bath (1130) with ice-bag over heart, cold pour to back of head and upper spine at the end of the bath.

14. **Cyanosis.**— Hot-blanket pack (1197) for 15 minutes, followed by cold mitten friction (1209). Avoid exposure of the body to chill by evaporation.

15. **Headache.**— Ice compress (1314) to head, or ice-cap (1323); hot pack to legs (1393) and hips (1389), or other derivative treatment; hot and cold cephalic compress (1358).

16. **Nose-Bleed.**— Ice-bag (1314) to back of neck; short hot fomentations (1328) to face. See 1496, 4.

17. **Delirium.**— Heating wet-sheet pack (1183); ice-cap (1323) to head; prolonged sweating pack (1197).

18. **Insomnia.**— Neutral wet-sheet pack (1182).

19. **Cerebral Congestion.**— Hip and leg pack (1189); ice head cap (1323).

20. **Fever.**— Prolonged neutral bath (1130); wet-sheet pack (1179), cooling enema, 1405. See 1485.

21. **Subnormal Temperature.** See 752, 1486.

22. **Pain in Abdomen and Back.**— Hot-blanket pack (1197) or large fomentations (1328) over affected parts, followed by heating compress (1344).

23. **Capillary Bronchitis.**— Hot-blanket pack (1197) followed by sweating wet-sheet pack (1187). Hot enemata (1406) followed by cold friction (1209) carefully given. Fomentation (1328) to the chest followed by heating compress (1344) or chest pack (1373), to remain in place an hour, or until thoroughly warmed. Repeat bath when temperature rises to 102°.

24. **Contraindications.**— Brand bath and cold immersions.

**General Method.**— Maintain warmth and activity of the skin, taking special care to avoid chilling of the shoulders, which should be especially protected by a wrapping closely applied. Combat pulmonary congestion by local applications made as above directed. Keep the temperature down by carefully managed hydropathic measures such as the heating pack (1183), the hot-blanket pack (1197), followed by cold mitten friction (1209), and like measures, rather than cold immersion baths and cooling packs, which aggravate pulmonary congestion by producing retrostasis. Promote vital resistance by frequently repeated partial cold rubbings (1209), and thus sustain the vital powers until opportunity has been afforded for the development of antitoxins and the suppression of the disease by the natural healing processes.

**ACUTE ARTICULAR RHEUMATISM.****[499 Etiological Indications.**

1. Absolute rest in bed. Abstinence from all solid food for a few days, allowing only ripe fruits, fruit juices, well dextrinized cereals (1630), and malted foods (1631). Avoid meats, animal broths, beef tea or extracts, eggs, oysters, cheese, and all foods rich in proteids.

**Pathological Indications.**

2. **Combat Inflammatory Process in Joints.**—Secure active cutaneous circulation by hot-blanket pack (1197) and sweating wet-sheet pack (1187); hot fomentations (1328) to the joints, followed by heating compress (1344). Keep the patient sweating until acute pain ceases and temperature falls.

3. **Prevent Extension of the Disease to the Heart, Lungs, Pleura, and Meninges** by promoting activity of the skin and kidneys, and building up the general vital resistance by carefully administered cold applications. The hot-blanket pack (1197), hot enemas (1406), hot trunk pack (1367), following each hot application by cold mitten friction (1209) administered carefully to all portions of the body free from local inflammation.

**Clinical Indications.**

4. **Encourage Elimination.**—The prolonged sweating bath administered by means of the hot-blanket pack (1197) continued for several hours, is a most valuable measure. The patient should not be taken out of the pack suddenly, but gradually, cold mitten friction (1209) being applied to each part until good reaction occurs before uncovering another portion. After rubbing, the surface should be carefully protected by flannel blankets. Free water drinking; large enema twice a day (1404).

5. **Pains in Joints.**—Hot-blanket pack (1197) followed by dry wrapping; fomentation (1328) to joints, repeated every 2 hours; during the interval a well-protected heating compress (1344) applied as soon as the fomentation is removed. Smear joints with vaseline daily.

6. **Fever.**—Hot-blanket pack (1197) continued to sweating, followed by sweating wet-sheet pack (1191) prolonged for several

hours, is the best means of lowering the temperature. When the temperature is very high, the neutral bath (1130), 92°–95°, may be employed. Ice compress to head and neck. Cold mitten friction (1209) or cold towel rub (1213) may be administered after the sweating pack (1191) or the hot-blanket pack (1197) two to three times daily.

7. **Profuse Perspiration.**—Do not check during early stage; simply wipe the patient with a dry cloth. If the temperature is very high, 104° to 105°, the graduated bath (1120) may be administered; the temperature should not be lowered below 85°. As the temperature is lowered, the patient should be rubbed with sufficient vigor to prevent chill. The cool enema (1405) may also be used in connection with the fomentation (1328) to the back. Be careful not to check perspiration suddenly, nor at all until acute symptoms subside.

8. **In Convalescence** encourage blood making by graduated cold baths (1625), especially cold mitten friction.

9. **Hyperpyrexia** (temp. 104° to 106°).—*a.* Prevent by ice-cap (1323), cold mitten friction (1209) at 50° to 40°, or cold towel rub (1213) at 60° to 50°, two or three times a day, when temperature rises above 101.5° F. May precede cold application by very hot sponging (1204).

*b.* Combat when temperature rises above 101.5° by mitten friction (1209), temperature 60°, every two or three hours, continuing until temperature falls to 101°. Continue application to each part until reddened, so as to prevent retrostasis (671). Graduated baths (1120) (102° to 85°) may be resorted to in obstinate cases, also the cool enema (1405). In all cases apply ice-cap (1323) and ice-collar (1316) to antagonize cerebral congestion and coma.

10. **Endocarditis, Pericarditis.**—The hot fomentation (1328) (not *very* hot) should be applied over the heart for half a minute at intervals of 1 hour. This should be followed by the ice-bag (1314) or cold precordial compress (1383).

11. **Pleurisy and Pneumonia.**—See 1498, 1573, 1574.

12. **Cerebral Rheumatism.**—Ice (1314) to head; prolonged neutral baths (1130), 92°; coloclusters (1407) at 80° three times a day; ice to head and neck; cooling pack; sweating pack, repeating two or three times daily.

13. **To Prevent Permanent Damage of Joints.**—Simple flex-



ions of the joints as soon as the fever declines; short applications of alternate compress or alternate douche two to three times daily, after convalescence begins, with a well-protected heating compress during the interval.

14. **Articular Affusions.**—Alternate compress (1340) or alternate douche (1044) three times a day, well-protected heating compress (1344) during interval; galvanism to joint; cataphoresis; static electricity; massage; bandaging.

15. **Nodosities.**—Scotch douche (1037) or fomentations (1328) three times a day, heating compress (1344) during interval until tenderness is removed, then alternate douche (1044) three times a day, followed by well-protected heating compress (1344); massage; galvanism.

16. **Arteritis and Phlebitis.**—Fomentation (1328) over affected part every 2 or 3 hours for 20 minutes; heating compress (1344) during interval, wrung very dry, and protected with mackintosh (1344).

17. **Neuralgia.**—Revulsive compress (1341) followed by dry cotton poultice; renew every hour or two.

18. **Neuritis.**—Complete rest of part; fomentation every 2 to 3 hours, followed by well-protected heating compress (1344).

19. **Tachycardia.**—Cold precordial compress (1383) for 15 minutes every hour; avoid hot food and drinks; ice-bag over heart (620) during hot applications to joints and other parts.

20. **Diarrhea.**—Neutral enema (1404), 95°, after each stool; cold abdominal compress (1318), 60°, during intervals, changed every hour.

21. **Gastralgia.**—Hot and cold gastric compress (1362), heat to epigastrium (1332), cold to spine (1372). Hot water drinking (1429); dry diet of well-dextrinized cereals (1630).

22. **Periostitis and Osteitis.**—Very hot fomentation (1328) for 15 minutes every 2 hours, heating compress (1344) during intervals, well wrung and well protected with flannel and mackintosh. If suppuration, early opening with knife.

23. **Urticaria.**—Sponging with very hot water (1204); hot saline or alkaline sponging (1206); prolonged neutral bath (1130).

24. **Contraindications.**—Cold immersion baths and cold douche.

**General Method.**—Aid the elimination of lactic acid by promoting cutaneous activity. This is also the best means of relieving the articular pains. The patient should be drenched with water through both the stomach (1423) and rectum (1404), to encourage profuse perspiration, and prevent undue increase in the specific gravity of the blood. Tonic and antipyretic measures must be used with great care, and so managed as to avoid retrostasis. Chilling the patient will increase the pain. The cold rubbings applied to maintain general vital resistance must be accompanied by hot applications to the joints, and if necessary, more extensive hot applications to the spine (1328) or legs (1393) to prevent chilling of the surface. Those hydiatic measures are most appropriate and efficient which aid heat elimination by dilating the surface vessels rather than by lowering the temperature of the skin.

## CHRONIC RHEUMATISM.

1500

*Etiological Indications.*

1. A nourishing dietary excluding meats; avoid fruits and vegetables at same meal, all indigestible foods and dishes, tea, coffee, condiments, and excess of salt. Carefully graduated cold bathing daily (1625).

*Pathological Indications.*

2. **Increase General Vital Resistance.**—This is the most important indication in this disease, as in malarial infection, and in acute rheumatism and other infectious maladies. Short sweating procedures (1246, 1250) of any sort followed by short and graduated cold applications (1625) are the most important general measures.

3. **Swelling of Joints.**—Fomentation three times a day; during intervals, heating compress (1344) wrung dry and well protected by mackintosh; derivative massage.

4. **Pain.**—See 1499, 5; Scotch fan douche (1037).

5. **Stiffness of Joints.**—Fomentation three times a day, well-protected heating compress during intervals; alternate articular douche (1100); massage of joints and muscles (1461); massage douche (1066); prolonged neutral bath (1130).

6. **Cardiac Disease.**—See 1576.

7. **Dry Skin.**—Sweating pack (1191); electric-light bath (1250); oil rubbing (1232); cold mitten friction (1209); cold

towel rub (1213); wet-sheet rubbing (1216); vapor bath (1246); hot-air bath, especially electric-light bath (1250); Turkish bath (1239); sun bath (1254).

8. **Contraindications.**—Very cold baths, especially immersions. See 1010, 1103, 1174, 1201, 1209, 1213, 1216, 1217. See also Acute Rheumatism, 1499.

#### TYPHUS FEVER.

##### 1501 *Pathological Indications.*

1. **General.**—See 1489, 4, 5, 6.

2. **Prevent Visceral Congestion and Degeneration.**—Hot-blanket pack (1197) followed by sweating wet sheet pack (1187) and prolonged neutral bath (1130), once or twice daily.

##### *Clinical Indications.*

3. **Fever.**—The graduated bath (1120), the prolonged tepid bath (1123), and the prolonged cooling pack (1181) are preferable to the Brand bath (1150), as tending less to produce visceral and cerebral congestion.

4. **Insomnia.**—The wet-sheet pack (1179) continued to the heating (1183) or sweating stage (1187). Repeat often as necessary and continue 2 hours or more if patient sleeps. Continuous cold to the head; ice-bag to neck and head.

5. **Delirium.**—Ice compress (1314) to head and neck; prolonged neutral bath (1130) or prolonged or repeated wet-sheet pack (1179).

6. **Cerebral Congestion.**—Fomentation (1328) to the upper spine; ice compress (1314) to the head and face; ice-collar (1316); ice-cap (1323); hot and cold cephalic compress (1358); wet-sheet pack (1179); hot-blanket pack (1197).

7. **Pain in Legs.**—Fomentation (1328) to the lower spine; hot hip (1389) and leg pack (1393) followed by wet-sheet pack (1179) or cold towel rub (1213).

8. **Persistent Vomiting.**—Ice-bag (1314) to the epigastrium; hot and cold gastric compress (1362); hot and cold trunk pack (1367); lavage (1401), if persistent.

9. **Complications.**—See 1507.

**General Method.**—Combat cerebral congestion by carefully maintaining a warm and active skin. Cold immersion baths (1114) when applied must be of brief duration and the brain

must be carefully protected by an ice-collar (1316) and ice-cap (1323) during the application. Less intense réfrigerative measures are preferable because of the danger attending strong retrostasis in this disease. In other particulars the management of this disease is essentially the same as that of typhoid fever.

## YELLOW FEVER.

*Pathological Indications.*

1502

1. **Maintain General Vital Resistance.**—Short hot applications followed by cold mitten friction (1209) or wet towel rub (1213) every 3 to 6 hours. Copious water drinking (1424); cool enema (1405) twice a day, more often if vomiting is persistent.
2. **Elimination of Poisons.**—Prolonged neutral bath (1130); water drinking (1424); enemas (1404). See 1473, 1474.

*Clinical Indications.*

3. **Chill.**—Dry pack (1192); hot water drinking (1429).
4. **Headache.**—Ice-cap (1323); hot and cold head compress (1358).
5. **Pain in Loins and Legs.**—Hot hip and leg pack (1197), trunk pack (1196). Fomentation over lower back (1328).
6. **Delirium.**—Ice-cap (1323), wet-sheet pack (1183) to heating stage.
7. **Cerebral Congestion.**—Ice-cap (1323), or ice-collar (1316); hot leg pack (1393); prolonged neutral bath (1130).
8. **Gastric Irritation.**—Fomentation (1328) over stomach every 2 hours; during interval heating compress (1344) at 60° renewed every 20 minutes; ice-bag (1314) to epigastrium; hot and cold gastric compress (1362) or hot and cold trunk pack,
9. **Vomiting.**—Ice pills; if necessary, withhold liquid-foods. and administer food and water by enema (1404); gastric lavage. Ice-bag over sternum; ice to spine; fomentation over stomach.
10. **Constipation.**—Cold enema (1405) twice daily; soap enema.
11. **Albuminuria.**—Fomentation (1328) to the back every 2 hours for 15 minutes; during interval, heating compress (1344), well protected; hot-blanket pack (1197) for 30 minutes, followed by short cold friction (1209) and wrapping in dry blankets (1192); repeat every 4 hours. Ice-bag over ster-

num; continuous abdominal heating compress (1344), changing every 20 or 30 minutes. Copious enema twice daily (1405).

12. **Collapse.**—Hot-blanket pack (1197); hot enema (1406); cold mitten friction (1209); cold compress over heart (620); fomentation over heart (1328) for 30 seconds, cold compress (1314) 10 minutes; repeat.

13. **Jaundice.**—Prolonged neutral bath (1130); large hot enema (1404) twice daily; copious water drinking (1423); fomentation (1328) over liver every 3 to 6 hours for fifteen minutes, heating compress (1344) during the intervals.

14. **Convulsions.**—Short hot bath (1126) followed or accompanied by cold affusion (1103) to head and spine; alternate compress (1342) to spine; heating wet sheet pack (1183).

15. **Coma.**—Alternate spinal compress (1342) or sponging (1342); hot enema (1406); cold friction (1209); ice-cap (1323).

**General Method.**—Combat visceral congestion from the start by maintaining a warm and active skin. Copious enemas (1404) and water drinking (1423) will encourage elimination of the poison while the frequently repeated cold rubbings stimulate vital resistance. The hydriatic method bids fair to rob this disease of its terrors, as shown by the experience of Jackson and others more than a century ago and numerous observers in more recent years.

## INFLUENZA, LA GRIPPE.

### 1503 *Pathological Indications.*

1. **Increase General Vital Resistance and Aid Elimination of Poisons.**—Sweating baths followed by vigorous cold applications; hot-blanket pack (1197) or hot immersion bath (1126); hot leg bath (1299) with fomentations (1328) to chest or spine, followed by cold mitten friction (1209), cold towel rub (1213) or wet-sheet rub (1216); sweating pack (1191, 1197). Copious water drinking (1424); large enema (1404) once or twice daily.

#### *Clinical Indications.*

2. **Pain in Head, Back, and Legs.**—Very hot leg pack (1393) till general perspiration begins, followed by cold mitten friction (1209), or cold towel rub (1213), keeping limbs very warm.

3. **Fever.**—Sweating wet-sheet pack (1187) and neutral bath (1130); cold mitten friction (1209); cold towel rub (1213); copious water drinking (1424); cooling enema (1405).
4. **Bronchitis, Broncho-Pneumonia, Pleurisy.**—See 1570, 1571, 1572, 1573, 1574.
5. **Headache.**—Hot and cold head compress (1358), fomentation to face (1328) especially over eyes.
6. **Nausea.**—Ice-bag (1314) over stomach.
7. **Vomiting.**—Hot and cold trunk pack (1367); withhold liquids.
8. **Diarrhea.**—Neutral enema (1404) after each movement. Cold abdominal compress (1318), changing every 15 minutes.
9. **Colic.**—Hot enema (1406); hot fomentation (1328) over abdomen.
10. **Inflammation of Eye or Ear.**—Fomentation (1328) over affected part; derivative treatment to legs—hot leg bath (1299); hot foot bath (1297); prolonged leg pack (1393).
11. **Neuritis.**—See 1543.
12. **Typhoid Influenza.**—See Typhoid State (1507, 17).
13. **Rheumatoid Influenza.**—Hot-blanket pack (1197) 2 to 3 hours once or twice daily, followed by cold mitten friction (1209) carefully administered, and wrapping in dry flannels. Repeat pack twice a day. Fomentation (1328) over especially painful parts, several times daily, followed by heating compress (1344) during interval.
14. **Thoracic Influenza, Bronchitis.**—See 1570.
15. **Lobar, and Broncho-Pneumonia.**—See 1498, 1573.
16. **Catarrhal Jaundice.**—See 1534, A.
17. **Meningitis.**—See 1495.
18. **Nephritis.**—See 1537.

**General Method.**—Combat pulmonary and visceral congestion by maintaining warmth and activity of the whole cutaneous surface, giving special attention to the lower extremities so as to divert blood away from the cranial and pulmonary cavities. Sweating procedures (1197, 1233, 1250) may be employed with vigor and frequently repeated if followed by short cold rubbings (1209) administered in such a way as to avoid general chilling of the surface.

**CHOLERA.****1504 Etiological Indications.**

1. **Prevent Further Infection.**—Boil drinking water, administer acid fruit juices to destroy cholera germs; avoid milk, meat juices, broths, which afford excellent nutrient media for the comma bacillus. Also avoid all solid food till convalescence is established.

**Pathological Indications.**

2. **Increase Vital Resistance.**—Hot full-bath (1126) or hot-blanket pack followed by cold mitten friction (1209) or cold towel rub (1213); hot-blanket pack (1197); short hot bath (1126) or hot enema (1406), followed by cold friction (1209) until surface is red.

3. **Combat Visceral Congestion.**—Hot-blanket pack (1197) followed by vigorous cold rubbing with mitt (1209) or towel (1213).

4. **Encourage Elimination.**—Prolonged neutral bath (95° to 98°) (1130); copious water drinking.

**Clinical Indications.**

5. **Vomiting.**—Lavage (1401); lavage with distilled water or boiled water containing 1 part pure hydrochloric acid to 4,000 parts of water (10 to 12 drops pure hydrochloric acid to the quart of water).

6. **Diarrhea.**—Large warm enema after each stool (1406), at first adding soap to the water. Cold compresses to the abdomen, changed every 20 minutes. Hot enemas, 108° to 110°, three to four pints. Hot enema, three to four pints, containing five to eight drams of tannic acid to the quart. Repeat every 2 hours.

7. **Cyanosis.**—Vigorous cold friction (1209); hot-blanket pack, followed by cold friction; dry pack with cold over heart; hot enema (110°), followed by cold friction.

8. **Scanty Urine.**—Hot enema (1406), frequently repeated; ice-bag (1314) over lower third of sternum. Hot-blanket pack (1197).

9. **Collapse.**—Alternate spinal sponging (1206, 1342) or compress (1340); cold friction (1209); hot enema (110°); alternate compress over heart.

10. **Cramps.**— Hot fomentations; short hot immersion bath (1126); rubbing of limbs.

11. **Heart Failure.**— Ice-bag or cold compress (1314) over heart for 15 minutes every 2 hours with general cold friction (1209).

12. **Contraindications.**— Prolonged hot baths; prolonged fomentations to abdomen.

**General Method.**— Relieve intense visceral congestion by maintaining warmth and activity of the skin; stimulate vital resistance by repeated cold rubbings (1209); while at the same time cleansing the stomach and bowels by frequent thorough washings, — gastric (1401) and rectal lavage (1410).

### DENGUE, BREAKBONE FEVER.

#### *Clinical Indications.*

1505

1. **Chill.**— Dry pack (1192).

2. **Fever.**— Cooling pack (1189); hot-blanket pack (1197), followed by sweating wet-sheet pack (1187); prolonged neutral bath (1130); copious enema (1405) twice daily.

3. **Swollen Joints.**— Fomentation (1328) every 3 hours; during intervals, heating compress (1344), changing every hour.

4. **Cerebral Congestion.**— Ice-cap (1323); ice-collar (1316, 1327).

5. **During Remission.**— Sweating wet-sheet pack (1187) followed by cold mitten friction (1209) or towel rub daily (1213). Moist abdominal bandage (1351) at night. Copious water drinking (1423). Cold mitten friction (1209) twice daily.

6. **Convalescence.**— Graduated tonic treatment (1625); aseptic diet (1626); wet girdle (1347) at night.

**General Method.**— During the febrile period of the disease the method is essentially the same as that of other infectious fevers. Advantage should be taken of the intermission to build up the patient's resistance and fortify him against a return of the malady by means of cold friction (1209), towel rubs (1213), or wet-sheet rubs (1216) two or three times a day, and a simple, dry, highly nutritious, aseptic dietary (1626). The treatment should be continued for some weeks after the fever has disappeared, so as to prevent relapse.



**PLAGUE.****1506 Pathological Indications.**

1. **Combat Visceral Congestion and Inflammation.**— Hot-blanket pack (1197) for one-half hour, followed by prolonged sweating wet-sheet pack (1187) 1 to 2 hours, repeating three times daily; copious water drinking (1423); large enema (1404) twice daily.

2. **Stimulate Resistance.**— Cold towel rub (1213) or mitten friction (1209) after each hot application, and at least as often as every 3 hours.

**Clinical Indications.**

3. **Pain in the Neck and Legs.**— Hot hip (1389) and leg pack (1393) or fomentation (1328) to the back every 3 or 4 hours, followed by heating compress (1344) to the back, changing hourly during the interval.

4. **Pain in the Head.**— Fomentation (1328) to the back of head for 5 minutes every 2 hours, followed by ice-cap or cold compress (1314); hot and cold head compress (1358).

5. **Gastric Hemorrhage.**— Hot trunk pack (1197) for 5 minutes, followed by ice-bag (1314) over the stomach; hot pack to hips (1389) and legs (1393), followed by continuous heating compress (1344) to each leg separately. Repeat every few hours if necessary.

6. **Intestinal Hemorrhage.**— Hot hip (1389) and leg pack (1393) for 10 minutes, followed by heating pack (1344) to each leg separately, ice-bag (1314) to abdomen. It is well to apply the ice-bag during hot applications.

7. **Renal Hemorrhage.**— The same as preceding, except that the ice-bag (1314) should be applied over the lower third of the sternum.

8. **Typhoid State.**— See (1507, 17).

9. **Collapse.**— Short hot immersion bath (1126) or hot-blanket pack (1197) for 15 minutes, followed by vigorous cold friction (1209) and warm wrapping of the body, repeated every 2 or 3 hours, if necessary.

10. **Cramps in Legs.**— Hot pack to legs (1393) followed by friction of the limbs with oil or vaseline.

11. **Buboes.**—Fomentation (1328) every 2 hours for 15 minutes; during interval, ice compress (1314) or heating compress (1344), whichever affords most relief. Lancing if suppuration occurs, then apply a cotton poultice over an antiseptic dressing with thorough drainage.

12. **After Reaction.**—Neutral bath for an hour to an hour and a half twice daily, followed by oil rubbing. Feed patient with fruit juice and well-dextrinized cereals (1630), grape juice, raspberry juice, buttermilk, kumyss.

**General Method.**—Maintain most intense activity of the skin by sweating baths (1197, 1233, 1250), followed by short cold rubbings (1209), thus relieving visceral congestion, and exciting vital resistance to combat the disease.

#### COMPLICATIONS COMMON TO ACUTE FEBRILE DISORDERS.

##### *Digestive System.*

1507

1. **Gastritis.**—Fomentation (1328) every 3 hours, followed by heating compress (1344) at 60°, to be changed every 30 minutes during interval.

2. **Entero-Colitis.**—Large hot enema (1406), 105°, followed by neutral enema (1404), 96°, after each movement. Fomentation (1328) to abdomen every 3 hours. Heating compress (1344) at 60° during intervals, changed every 30 minutes.

3. **Peritonitis.**—Hot soap enema (1406) 3 times daily; fomentation (1328) every 3 hours; heating compress (1344) at 60° during interval, changing every 30 minutes.

4. **Pericarditis, Endocarditis.**—Fomentation (1328) for 30 minutes every hour, followed by ice-bag (1314) or cold compress, (1318) to be removed for 5 minutes every 15 minutes. Hot hip (1389) and leg pack (1393) if extremities are cold. Cold mitten friction (1209) to maintain surface circulation.

5. **Phlebitis, Arteritis.**—Hot-blanket pack (1197) followed by cold mitten friction (1209), carefully avoiding the affected part; or hot pack (1197) to affected limb 15 minutes every 3 hours. The hot application should be followed by the heating compress (1344) which is changed after the next hot application, and retained during the interval.

6. **Laryngitis.**—Steam inhalation (1419); fomentation to throat (1328) every 3 hours with heating compress (1344) during interval, renewed every 15 minutes at first, later once an hour. Derivative applications to legs,—hot foot baths (1297), hot leg packs (1393), heating leg pack (1183). Repeat three to four times daily. Fomentation (1328) for 15 minutes every 3 hours, with well-protected heating compress (1344) between, changing once an hour. Derivative treatment to lower extremities. Steam inhalation (1419) 15 minutes every hour.

7. **Broncho-Pneumonia.**—Fomentation to chest (1328) every 2 hours, heating compress (1344) at 60° during the interval, changing every 30 minutes; hot-blanket pack (1197) for 15 minutes, followed by heating (1183) or sweating wet-sheet pack (1187), one to three applications each 24 hours.

8. **Pleurisy.**—Fomentation (1328) every 15 minutes until pain is relieved. Repeat every 3 hours; well-protected heating compress (1344) during interval. Tight bandage about chest if necessary to control pain.

9. **Nephritis, Albuminuria.**—Hot-blanket pack (1197) for 30 to 60 minutes two to three times in 24 hours. Follow by cold friction (1209). Protect the surface, and maintain vigorous surface circulation. Large enema (1404) 3 times a day; copious water drinking (1424); fomentation (1328) to lumbar region every 4 hours for 30 minutes, followed by heating compress (1344) during interval; ice-bag over lower sternum.

10. **Edema.**—The same treatment as above (9) with the addition of the cold precordial compress (1383) 15 minutes every 2 hours.

11. **Delirium.**—Ice-cap (1323); ice-collar (1316); heating wet-sheet pack (1183) continued 1 to 2 hours. Prolonged tepid or neutral bath (1130).

12. **Paralysis.**—Ice-cap (1323), ice to spine (1372); alternate with fomentation (1328) for 3 minutes every 15 minutes, repeating four times. Repeat every 4 hours.

13. **Convulsions.**—Ice-cap (1323); ice to spine (1372); hot hip (1389) and leg pack (1393). Hot immersion bath (1126) 105°, 5 to 8 minutes, with ice to head and neck (1314).

14. **Abscess.**—Fomentation (1328) for 15 minutes every 2 hours; heating compress (1344) at 60° during interval. Renew every 15 to 30 minutes.

15. **Visceral Inflammation.**—Large hot fomentation (1328) over inflamed part for 15 minutes every 2 hours. During the interval, heating compress (1344) at 60°, renewed every 15 minutes during the acute stage. Later, fomentation (1328) 3 times a day, with continuous heating compress (1344) during intervals.

16. **Threatened Gangrene.**—Alternate compresses (1340) every 3 hours, heating compress (1344) or dry heat during intervals.

17. **Typhoid State.**—Aseptic diet (1626); copious water; drinking (1423); neutral enema (1404) (95°) daily; prolonged neutral (1130) or tepid bath (1123); graduated bath (1120) Brand bath if no contraindications (1150, 1489, 65). See Typhoid Fever (1489, 5, 15, etc.).

#### PULMONARY TUBERCULOSIS.

##### *Etiological Indications.*

1508

1. Destroy sputum; avoid swallowing sputum; live in the open air and sleep in cool, well-ventilated rooms.

##### *Pathological Indications.*

3. **Increase General Vital Resistance.**—Graduated cold baths (1625), twice daily; fattening dietary; systematic exercise; out-of-door life; cool, dry, elevated climate; very short electric-light bath (1250) daily, or three times a week.

##### *Clinical Indications.*

4. **Anemia.**—Cold bath twice daily; food rich in fat and blood-making material; easily digested foods rich in proteids, such as kumyss, buttermilk, purées of peas, etc., (1626, 1630, 1631.)

5. **Indigestion — Anorexia.**—Dry aseptic dietary (1626), kumyss, malted cereals (1631). Wet girdle (1347); ice-bag over the stomach half an hour before meals. See Gastric Catarrh (1520) and Hypopepsia (1521).

6. **Chill.**—Rest in bed, dry pack (1192), hot water drinking (1429).

7. **Cough.**—Fomentation (1328) to chest, followed by heating chest pack (1373); sipping hot water when inclined to cough.

8. **Pain.**—Revulsive compress (1341) 15 minutes two or three times daily; during intervals, well-protected heating compress (1379).

9. **Pulmonary Hemorrhage, Pulmonary Congestion.**— Very hot application to spine between shoulders. Ice to chest (1314), ice to hands (1302). Hot leg pack (1393). Keep the extremities warm. Elevate the chest and shoulders.

10. **Fever.**— Neutral pack (1182), 15 to 20 minutes. Free water drinking (1423). Rest in the horizontal position until the daily evening temperature becomes nearly normal.

11. **Night Sweats.**— Very hot sponging (1204) at bedtime.

12. **Hypopepsia.—Atonic Dyspepsia.**— Daily general cold applications (1625); ice-bag (1314) over stomach for half an hour before meals.

13. **Diarrhea.**— Enema (1404) at 95°, after each movement followed by cold abdominal compress (1318) at 60°, changing every half hour. Rest in bed till checked.

14. **Cough.**— See 1570, 4-7.

15. **Laryngitis.**— See 1568.

16. **Emaciation.**— See 1516.

17. **Contraindications.**— Avoid general cold baths when hemorrhage is threatened, as immersion bath, affusion and cold sitz-bath, also Turkish and Russian baths.

**General Method.**— The great object to be kept in mind in the hydriatic treatment of this disease is to build up the patient's vital resistance by carefully graduated cold applications repeated two or three times daily. The intensity of the application should be steadily increased from day to day in order to secure good results. No patient is too feeble to receive hydriatic treatment of some sort, and by careful graduation persons of feeble physique but in whom the disease is not yet far advanced may be trained to receive very vigorous cold applications with excellent effects. In making the cold applications care must be taken to avoid chilling of the patient, the ill effects of which will be at once manifest by aggravation of the cough (1625).

#### TUBERCULOSIS OF LYMPH GLANDS, SCROFULA.

##### 1509 *Pathological Indications.*

1. **Increase General Vital Resistance.**— Graduated cold applications (1625); sun baths (1254); cold air baths; gymnastics; out-of-door life; aseptic diet rich in fats and proteids (1626); residence in elevated region.

**Clinical Indications.**

2. Revulsive (1341) or alternate compress (1340) over swollen glands twice a day. During intervals, flannel-covered heating compress (1344) renewed before becoming dry.

3. Suppurating glands must be treated surgically. Removal of the glands is sometimes necessary.

**WHOOPING COUGH.**

1. **Increase Vital Resistance.**—Cold mitten friction (1209) 1510 or cold wet-hand rub (1213) three times a day.

2. **To Relieve Cough.**—Chest and neck pack (1373) changing every four hours. Copious drinking of hot water (1429) especially just before coughing paroxysm. The patient should drink three to eight pints of water daily.

3. Neutral bath (1130) daily for a half-hour, followed by cold mitten friction (1209) to promote activity of the skin and kidneys.

4. The disease can not be greatly shortened, but the strength may be maintained, suffering mitigated, convalescence facilitated, and grave sequela prevented by the faithful employment of the above measures, which should be continued, not only during the active stage of the disease, but for several weeks after the beginning of convalescence.

**LITHEMIA, URIC ACID DIATHESIS.****Etiological Indications.**

1511

1. A spare aseptic diet (1626), especially avoiding beef tea, animal broths, and also tea, coffee, or cocoa. Use fruits freely. Kumyss or buttermilk is preferable to raw milk. In extreme cases, fruit diet for a few days (1627). Out-of-door life; abundant exercise; dry, cool climate; daily cold bathing.

**Pathological Indications.**

2. **Increase Oxidation of Proteid Wastes.**—Hot bath (1126), prolonged sufficiently to elevate body temperature 2° to 4°; sweating wet-sheet pack (1191); dry pack (1192); vapor bath (1246); hot-air (1233) or Turkish bath (1239). Electric-

light bath (1250), or hot full-bath (1126), followed by dry pack (1192); follow all hot baths by a short, cold application adapted to the patient's condition, cold mitten friction (1209), cold towel rub (1213), wet-sheet rub (1216), dripping sheet (1217), shallow bath (1174), cold rain douche (1047). Follow bath by prolonged moderate exercise, or massage and manual Swedish movements. Inhalation of oxygen; oxygen enema.

3. **Encourage Elimination of Tissue Wastes.**—In addition to above, water drinking (1423); free use of fruit juices and carbonated distilled water; wet girdle (1347) day and night; cool colocylyster (1407) daily, if bowels are sluggish.

4. **Increase Alkalinity of Blood.**—Exercise; cold baths; cold air bath (1470); sweating baths; fruit diet (1627).

#### **Clinical Indications.**

5. **Swollen and Painful Joints.**—Fomentation (1328) two to four times daily, heating compress (1344) during intervals, well-protected with mackintosh and cotton or flannel covering.

6. **Painful Joints, not Swollen.**—Revulsive compress (1341) three times a day, followed by deep massage of limb above the joint and light centrifugal friction (1224) of the joint; during intervals, dry pack or cotton poultice (1388) to the joint.

7. **Stiff and Enlarged Joints.**—Alternate jet or spray (1044, 1055) or the alternate compress (1340), followed by thorough massage of the joint with passive joint movements, applied twice daily, well-protected heating compress (1344) during intervals.

8. **Headache and Migraine.**—See 1562, 6, 7, 8, 11, 12.

9. **Neurasthenia.**—See 1554.

10. **Neuralgia.**—See 1545.

11. **Insomnia.**—See 1564.

12. **Muscular Pains.**—See 1513.

13. **Gall Stones.**—See 1534 B.

14. **Renal Colic.**—See 1536.

15. **Irritable Prostate.**—See 1594, 2.

16. **Arterio-Sclerosis.**—See 1577, 8.

17. **Bright's Disease.**—See 1538.

18. **Contraindications.**—Prolonged cold baths.

**General Method.**—Diminish the production of uric acid by regulation of diet (1626); increase the destruction of uric acid

by exercise, prolonged hot baths (1197, 1233, 1250), followed by short cold applications (1209, 1213); increase elimination of uric acid by copious water drinking (1423).

## GOUT.

1512

***Etiological Indications.***

1. Avoid meats, tea, coffee, tobacco, sometimes even milk and eggs; take daily sufficient exercise in the open air to cause perspiration, followed by short cooling bath. Diet: fruits, dextrinized cereals, nuts, kumyss, buttermilk (1626-1631).

***Pathological Indications.***

2. **Encourage Tissue Change, Especially Oxidation of Protein Wastes.**—Prolonged sweating baths—vapor (1246), Turkish (1239), electric-light (1250) or hot-air bath (1233), sweating wet-sheet pack (1187), dry pack (1192), hot-blanket pack (1197), followed by daily cold bath, carefully given, and nicely graduated (1625). Out-of-door life.

3. **Maintain Normal Alkalinity of the Blood.**—Tonic graduated cold applications (1625), free use of fruits; avoid flesh foods, tea, coffee, and alcohol.

See Lithemia (1511).

**A. Acute Form.*****Clinical Indications.***

4. **Headache.**—Water drinking (1423); enema (1404); hot and cold cephalic compress (1358) with hot foot (1297) or leg bath (1393).

5. **Migraine.**—Lavage (1401); revulsive compress to seat of pain (1341); hot leg (1299) or foot bath (1297); enema (1404); hot enema (1406); fomentation over stomach (1328); fomentation over spine (1328); alternate spinal compress (1342).

6. **Constipation.**—Cold enema (1405).

7. **Hemorrhoids.**—If inflamed, hot fomentations (1328) to relieve pain, followed by cold compress (1314) to anal region and buttocks; cool enema.

8. **Pruritis Ani.**—Very hot anal douche (1087).

9. **Pain and Swelling of Joints.**—Elevate limb; cooling compress (1318); change soon as warm.

10. **Fever.**—Hot-blanket pack (1197) followed by prolonged neutral bath (1130).



11. **Scanty Urine.**—Water drinking (1423) (distilled carbonated water) (1428); enema (1404) twice daily. See 1537.

12. **Retrocedent Gout.**—For coma or delirium, cold to head and neck (1314); large enema (1404); hot-blanket pack (1197); hot immersion (1126).

13. **Cardiac Complications, Syncope.**—Hot enema (1406); alternate compress to spine (1342).

14. **Gastro-Intestinal Disturbance by Retrocession.**—Fomentation (1328) over stomach; hot trunk pack (1197); hot immersion (1126) or hot-blanket pack (1197) with heating gastric compress (1344) during interval.

15. **Contraindications.**—Avoid cold baths; avoid immersion of affected parts in cold water, and general cold baths.

#### B. Chronic Form.

16. The general measures indicated above. See also 1511.

17. **Increase circulation** in affected parts by hot fomentations (1328) followed by dry cotton pack (1388) or heating compress (1344); massage, at first derivative only; later, to joint itself.

18. **Constipation.**—Relaxing diet; wet girdle (1347); cold water drinking (1423); abdominal massage.

19. **Hepatic Congestion.**—Revulsive hepatic compress (1341) every 3 hours; heating compress (1344) during interval.

20. **Gravel.**—Copious water drinking (1423) and large enema (1404) daily. See Uric Acid Diathesis, 1511.

21. **Melancholy.**—Vigorous sweating baths (1191, 1250) followed by short cold percussion douche to the spine (1074). See Melancholia (1558).

22. **Bronchitis.**—See Chronic Bronchitis, 1570.

23. **Asthma.**—Scotch douche to legs (1037); large enema (1404); prolonged neutral bath (1130); fomentation (1328) to chest followed by the chest pack (1373).

24. **Epilepsy.**—See 1551.

25. **Angina Pectoris.**—Fomentation (1328) over heart for 1 minute followed by cool compress (1314) for 10 minutes, repeat; hot foot bath (1297) or hot leg pack (1393); ice bag to spine (1372); rest in bed; keep extremities very warm.

**General Method.**—The general methods to be pursued in this disease are essentially the same as those applicable to the Uric Acid Diathesis, or Lithemia, 1511.

**ACUTE MUSCULAR RHEUMATISM.*****Pathological Indications.*****1513**

1. See Acute Rheumatism, 1499.

***Clinical Indications.***

2. The same as for acute articular rheumatism (1499) except that the local applications are made to the muscles instead of to the joints. Sweating baths (1197, 1191) especially the electric-light bath (1250) and the vapor bath (1246); long neutral baths (1130); fomentation (1328) over painful parts followed by the well protected heating compress (1344); water drinking (1423); aseptic diet (1626).

**DIABETES.*****Pathological Indications.*****1514**

1. **Increase Oxidation of Sugar.**—A large amount of moderate out-of-door exercise, especially respiratory exercise and daily cold baths.

2. **Increase Absorption of Oxygen.**—Graduated cold baths (1625); out-of-door exercise; breathing exercises; oxygen inhalation.

3. **Improve Intestinal Digestion.**—Cold percussion douche (1035) to spine; short cold fan douche (1061) to abdomen; wet girdle (1347) day and night; fomentation to abdomen twice daily; abdominal massage.

4. **Diabetic Diet.**—Eggs, buttermilk, kumyss, gluten biscuit, zwieback, fruits, except dates and figs, green peas, strawberries, spinach, greens, nuts and nut products of all sorts except chestnuts.

***Clinical Indications.***

5. **Sciatica.**—Hot leg pack (1393); Scotch douche (1037); rest in bed.

6. **Rheumatic Pains.**—Electric-light bath (1250) or sweating pack (1191) until patient perspires 5 to 8 minutes. Follow by a suitable cold application.

7. **Obesity.**—Vigorous exercise; monotonous diet; sweating baths (1191, 1197) three times a week; vigorous cold applications daily; dripping sheet rubs (1217); half bath (1174); cooling pack (1189); plunge bath (1108).

8. **Emaciation.**—Rest in bed; cold mitten friction (1209) or towel rubbing (1213); massage; diet rich in fats and proteids.

9. **Boils.**—Prolonged neutral baths (1130); tri-weekly soap shampoo.

10. **Pruritis.**—Prolonged neutral baths (1130) followed by cold mitten friction (1209) to sound parts of skin; neutral compress (1339).

11. **Somnolence.**—Copious water drinking (1423); hot enema (1406), repeated every 3 or 4 hours; prolonged neutral bath (1130) with cold affusion (1103), 60°, to head and spine at intervals of 15 minutes. Hot-blanket pack, 15 minutes (1197), followed by cold friction (1209) and dry pack (1192).

12. **Constipation.**—Enema (1404) at 70° daily; wet girdle (1347). See 1524.

13. **Insomnia.**—Prolonged neutral bath (1130) at bedtime; neutral pack (1182), 30 to 40 minutes; neutral spray (1057) or broken douche (1031), 3 to 4 minutes at bedtime.

14. **Bronchitis.**—Chest pack (1373); steam inhalation (1419); Scotch douche (1037) to legs.

15. **Pulmonary Congestion.**—See 1572.

16. **Edema of Legs.**—Rest in bed; cold precordial compress (1383), 15 to 30 minutes three times daily. Revulsive compress (1341) or Scotch douche (1037) to legs three times a day, allowed during interval by heating compress (1344).

17. **Pneumonia.**—See 1498.

18. **Cardiac Dilatation.**—Cold precordial compress (1383) or ice-bag (1314) over heart 15 minutes three times a day; effervescent bath (1139). Carefully graduated exercises by the Schott method.

19. **Threatened Gangrene.**—Alternate compress (1340) or pour (1103) to affected part and large adjacent area three times a day; protected heating compress (1344) during interval.

20. **Cirrhosis of Liver.**—Alternate hepatic compress (1340) or douche (1044) twice daily. During interval, well-protected heating compress (1344).

21. **Nephritis.**—See 1537.

22. **Cystitis.**—See 1539.

23. **Eczema.**—Alkaline bath (1113, 1463); or neutral bath (1130), 30 minutes twice daily; zinc ointment.

24. **Thirst.**—Frequent drinking of small quantities of cold water, as half a glass every hour. Sipping very hot water.

25. **Dry Skin.**—Vapor bath (1246) or prolonged neutral bath (1130), followed by oil rubbing daily (1232), or two or three times a week.

26. **Contraindications.**—If emaciated, avoid exercise and prolonged hot or cold baths.

**General Method.**—The general plan of treatment in this disease is essentially the same as that required in the treatment of obesity, which this disease closely resembles, but in cases of diabetes accompanied by emaciation, very cold procedures, especially cold immersions (1114), which are applicable to cases of obesity and cases of diabetes in which the patients are fleshy, must be carefully avoided, and the principal reliance must be placed upon short cold procedures which build up the patient's resistance while increasing oxidation of carbon to a moderate degree. Special attention must be given to improving the intestinal digestion, the faulty character of which is doubtless largely responsible for this disease.

## OBESITY.

### *Pathological Indications.*

1515

1. **Increase Oxidation of Hydrocarbons.**—Moderately prolonged cold baths, especially wet-sheet pack (1179); shallow bath (1174); cold rain douche (1047); dripping sheet (1217); shallow bath (1174); plunge bath (1108); exercise to the extent of fatigue several times daily. The cold bath may be advantageously preceded by the electric-light bath (1250), or some other form of sweating bath (1191, 1197) not too prolonged. Exercise should always be preceded by a cold bath of sufficient duration to lower the temperature a few tenths of a degree.

### *Clinical Indications.*

2. **Cardiac Weakness.**—Cold precordial compress (1383) (except in fatty degeneration of heart) 15 to 30 minutes three times daily; graduated exercises, effervescing bath (1140).

3. **Bronchitis.**—See 1570.

4. **Albuminuria.**—See Nephritis 1537.

5. **Diabetes.**—See 1514.

6. **Rheumatic Pains.**—See 1499, 5.

7. **Contraindications.**—Avoid prolonged hot baths unless immediately followed by cold bath.

**General Method.**—Increase the consumption of carbon by prolonged cold baths (1114) and vigorous exercise while reducing the daily ration to the lowest point consistent with the maintenance of the patient's strength. The treatment must never be conducted in such a way as to diminish the patient's muscular or nervous energy. If the patient complains of feeling weak or debilitated, the vigor of the treatment must be diminished. There should be a steady gain in muscular strength accompanying the loss of flesh. The patient's strength should be determined at least weekly by the dynamometer so that his condition may be exactly known. Hot baths are especially debilitating.

#### EMACIATION.

#### 1516 *Pathological Indications.*

1. Rest in bed, fat- and blood-making diet (kumyss, buttermilk, eggs, dextrinized cereals [1630], malted or predigested cereals [1631]); graduated tonic treatment (1625). Fomentation (1328) over stomach twice daily followed by wet girdle (1347).

#### *Clinical Indications.*

2. **Persistent Vomiting.**— See 1519, 3.

3. **Gastric Ulcer.**— Withhold food by mouth; rectal feeding; fomentation (1328) over stomach twice daily; well-protected heating compress (1344) during interval. Graduated hyriatic treatment. See 1625.

4. **Chronic Gastritis.**— Rest in bed; abdominal fomentations (1328), 2 to 3 times daily; protected heating compress (1344) during interval. See 1520.

5. **Intestinal Catarrh.**— Enema (1404) at 95° after each stool. During interval heating compress (1344) at 60°, changing every 30 minutes. See 1529.

6. **Hypopepsia.**— Graduated tonic treatment (1625); ice-bag (1314) over stomach half an hour before each meal. See 1521.

7. **Hyperpepsia.**— See 1522.

8. **Diabetes.**— See 1514.

9. **Insomnia.**— See 1564.

10. **Tuberculosis.**— See 1508.

11. **Chronic Malarial Infection.**— See 1490.

12. **Chronic Bronchitis.**— See 1571.

13. **Asthma.**— See 1571, 4.
14. **Drug Habits.**— See 1612.
15. **Pelvic Disease.**— See 1586-1592, 1596.
16. **Rachitis.**— See 1517.
17. **Scurvy, Purpura.**— See 1518.
18. **Contraindications.**— Avoid prolonged hot baths and cold immersion baths.

**General Method.**— The general plan of treatment must be such as to secure increased income of tissue-building material with a diminished outflow, hence the diet must be very simple, easily assimilable, and taken in as large a quantity as possible. Exercise must be diminished, or in grave cases suspended altogether. Moderate exercise may be allowed if necessary to maintain the appetite. Special attention must be given to increase of the appetite and improvement of digestion by suitable hydriatic applications. Cold applications must be very short and intense, so as to produce strong nervous impressions upon the nerve centers without to any considerable degree removing animal heat or increasing oxidation.

#### RACHITIS, RICKETS.

##### *Pathological Indications.*

1517

1. **Increase General Vital Resistance.**— Carefully graduated hydriatic treatment (1625) applied twice daily; aseptic dietary of substances rich in fats and proteids. Massage (1461); oil rubbing (1232); sun baths (1254); out-of-door life.

#### SCURVY, PURPURA.

##### *Pathological Indications.*

1518

1. **Increase General Vital Resistance.**— Neutral bath (1130) three times a week, 30 to 60 minutes; cold towel rub (1213) carefully administered twice daily; gentle massage. Aseptic dietary (1626); abundance of fruits, kumyss, butter-milk, dextrinized (1630) and malted foods (1631).

##### *Clinical Indications.*

2. **Local Pain.**— Alternate sponging (1204) or compress (1340); fomentation (1328), followed by heating compress (1344); rest in bed.

3. **Edema.**— Alternate compress (1340) or spray (1055); leg pack (1393); dry bandaging. Centripetal friction (1221).

**ACUTE GASTRIC CATARRH.****1519 Etiological Indications.**

1. **Rest.**— Withhold food if necessary, administering food and water by enema for several days (1404).

**Pathological Indications.**

2. **Combat Local Inflammation.**— Fomentation (1328) for 15 minutes over stomach and bowels every 2 hours. During intervals, heating compress (1344) at 60°, changing every 30 minutes. Hot foot bath (1297); hot leg pack (1393).

**Clinical Indications.**

3. **Vomiting.**— Ice-bag (1314) to epigastrium; hot and cold gastric compress (1362); hot and cold trunk pack (1367); ice (1372) to spine opposite stomach; careful lavage (1401) if vomiting is persistent and rejected matters offensive.

4. **Pain.**— Revulsive compress (1341) 10 minutes every hour. Heating compress (1344) during interval.

5. **Fever.**— Hot-blanket pack (1197) 20 minutes, followed by cold half pack (1196); prolonged neutral bath (1130); cooling pack (1189), following fomentation (1328) over stomach.

6. **Contraindications.**— Cold immersion baths and general cold douche.

**CHRONIC GASTRITIS.****1520 Etiological Indications.**

1. **Avoid causes,** as, mustard, pepper, vinegar, strong acids, even acid fruits; sugar, preserves, cheese, alcoholic beverages, tea and coffee, all indigestible and irritating substances, coarse vegetables, pickles, confectionery, and hasty eating.

2. **Physiological Rest.**— Avoid the use of fish, fowl, game, and all flesh foods, which excite the secretion of HCl and remain long in the stomach. Coarse vegetables, fried foods, fats, except in a natural emulsified condition, large meals, tea, coffee, wines, and all liquors are to be avoided.

**Pathological Indications.**

3. **Increase General Vital Resistance.**— Graduated cold baths (1625) twice daily.

4. **Combat Local Congestion.**— Gastric fomentation (1328)

three times daily, 15 min.; during intervals, heating compress (1344). Hot leg pack (1393) followed by heating compress (1344) to legs; Scotch douche (1037) to legs; hot leg bath (1299), followed by cold friction (1209) to legs. In acute exacerbations, withhold all food, rest in bed.

**Clinical Indications.**

5. **Mucus Vomiting in Morning.**—Omit the evening meal. Fomentation (1328) over stomach in evening followed by heating compress (1344) to be worn during the night; lavage (1401) at bedtime.

6. **Vomiting Soon after Eating.**—Hot and cold gastric compress (1362) or trunk pack (1367) half an hour before eating, to be retained 2 hours; dry food in small quantity; rest in bed after eating; ice-bag to spine after eating.

7. **Gaseous Eructations.**—Lavage (1401) once or twice a week; dry diet of predigested cereals (1630). Cold compress (1314); heating compress (1344) over stomach at 60°, changing every 4 hours. Massage for half an hour 2 hours after eating, if local irritation or tenderness does not contraindicate. Drink pint of hot water half an hour before eating. Avoid use of vegetables, or of vegetables and fruits at same meal.

8. **Abdominal Tympanitis.**—Abdominal heating compress (1351), 60°, changed every 4 hours; large soap enema (1404) or colocolyster (1407) two or three times a week, at 70°.

9. **Constipation.**—Graduated cold enema (1409) 70°, daily. Abdominal massage; wet girdle (1347); cold douche to abdomen (1081), fan (1061) or broken jet (1010), 20 seconds; cold rubbing sitz (1309).

10. **Hepatic Congestion.**—Fomentation (1328) over liver twice daily; during interval, continuous heating compress (1344).

11. **Emaciation.**—Rest in bed; mild tonic hydropathic treatment, carefully graduated (1625). Ice-bag (1314) over stomach half an hour before eating. See 1516.

12. **Pain in Stomach.**—Revulsive compress (1341) over epigastrium; repeat several times daily if necessary. Avoid acid fruits, very hot foods, very cold foods, and concentrated sweets if they cause pain.



**HYPOPEPSIA AND APEPSIA.****1521 Pathological Indications.**

1. **Increase General Vital Resistance.**—Graduated tonic hydriatic treatment (1625) twice daily; out-of-door life; cold-air bath (733, 1470); swimming.

2. **Increase Activity of Gastric Glands.**—Cold fan douche (1061) over stomach; cold percussion douche (1035) to dorsal spine; general cold douche (1010) or other cold procedure (1625); wet girdle (1347); external and internal galvanism of stomach. Drink a third of a glass of cold water half an hour before eating.

3. **Increase Motility.**—Cold gastric douche (1094) 3 hours after meals; small cold enema, retained, three to four hours after eating; abdominal massage; manual and mechanical Swedish movements; galvanization of cervical and abdominal sympathetic.

**Clinical Indications.**

4. **Indigestion, Bilioussness.**—Hydrochloric acid being absent, flesh meats must be withheld. Aseptic diet (1626); avoid fried foods, rich gravies and animal fats, which lessen the secretion of HCl (Pawlow), cane sugar, and concentrated sweets. Hot applications over the stomach an hour after eating.

5. **Loss of Appetite.**—Ice-bag over stomach half an hour before each meal; hot and cold gastric lavage (page 886); cold mitten friction (1209) before breakfast; repeat before dinner if necessary; small cold enema (1404) or cold rectal irrigation (1410) before breakfast.

**HYPERPEPSIA.****1522 Etiological Indications.**

1. Avoid irritating food substances, mustard, pepper, spices, condiments of all sorts, flesh foods of all sorts, excess of proteids, hot foods, mushes, farinaceous and sweet desserts, frequent meals.

**Pathological Indications.**

2. **Increase General Vital Resistance.**—Graduated tonic hydriatic treatment (1625) twice daily.

3. **Combat Irritation of Gastric Glands, or Hypersecretion.**—Revulsive compress (1341) twice daily, an hour before meals; continuous heating compress (1351) without mackintosh during

interval. Avoid cold douche over stomach and spine opposite, and prolonged cold baths. Hot douche (1024) or fomentation over stomach and spine opposite 3 to 4 times daily. Hot immersion bath (1126) at 105° for 15 minutes, or electric-light bath 10 minutes, half an hour before dinner. Follow by cold mitten friction (1209). Sip half a glass of hot water half hour before eating.

4. **Combat Toxemia.**—Sweating procedures; electric-light bath (1250); sweating pack (1191); vapor bath (1246); prolonged neutral bath (1130); follow hot baths by short cold application, as a wet-sheet rub (1216), cold towel rub (1213), cold shower (1047), douche with broken jet (1010). Water drinking (1423). Enema (1404) daily for a week or two, 70°, injecting a second portion to be retained.

5. **Flatulence of Stomach and Bowels.**—Cold abdominal compress (1318), changed every 4 hours; cold enema, following fomentation for 15 minutes twice a day.

6. **Painful Digestion.**—Hot fomentation (1328) an hour after eating for 15 minutes, followed by heating compress (1344) to be worn until next meal.

7. **Gastric Irritation with Vomiting After Eating.**—Hot and cold gastric compress (1362) or hot and cold trunk pack (1367) applied half an hour before eating and continued for 2 hours.

8. **Contraindications.**—Cold douche over stomach, cold shower, and prolonged cold baths of all sorts.

## DILATATION OF THE STOMACH.

### *Etiological Indications.*

1523

Aseptic diet (1626); avoid overeating, frequent eating, and gas-forming foods, also drinking large quantities at once. Give very simple dry dietary of well-dextrinized (1630) or predigested (1631) cereals or liquid diet,—kumyss, acid buttermilk, purées, or gruels prepared from predigested cereals, nut creams or emulsions.

### *Pathological Indications.*

1. **Combat Gaseous Distension of Stomach.**—Lavage (1401) at regular intervals as required to prevent food accumulation. Cold gastric compress (1314) without impervious cover-

ing, changed every 4 hours; cold fan douche (1061) over stomach twice daily.

2. **Increase General Vital Resistance, Combat Autointoxication.**—Short sweating baths,—electric-light bath (1250); sweating wet-sheet pack (1187); hot immersion (1126) 4 to 6 minutes, at 105°; hot-blanket pack (1197); hot enema (1405). Follow each hot bath by a tonic application (1625).

**Clinical Indications.**

3. **Vomiting.**—Lavage (1401); withholding food; if persistent, feeding by nutrient enema; ice-bag (1314) over stomach and to spine opposite.

4. **Pyrosis.**—Hot water drinking (1429) before retiring at night; fomentation (1328) over stomach at bedtime, with wet girdle (1347) overnight; sipping half a glass of very hot water on rising in the morning. A few ounces of orange juice or other natural, unsweetened fruit juice a half-hour before eating.

5. **Enteroptosis.**—Massage with replacement of viscera, electricity to abdominal muscles; manual Swedish movements to strengthen abdominal muscles; cold fan douche (1061) to abdomen; abdominal supporter.

6. **Constipation.**—Graduated cold enema (1409); cold douche (1010) to abdomen; wet girdle (1347); regularity at stool. See 1524.

6. **Pain.**—Fomentation over the abdomen (1328) followed by heating compress (1344), protected by flannel only.

**Complications.**

7. **Neurasthenia.**—See 1554.

8. **Hysteria.**—See 1553.

9. **Delirium.**—Hot-blanket pack (1197) followed by cold mitten friction (1209); heating wet-sheet pack (1183), succeeded by dry pack (1192); lavage (1401); colocylyster (1407).

10. **Coma.**—Lavage; colocylyster; hot and cold head compress (1358); hot and cold to spine (1342); hot-blanket pack (1197); hot enema (1406); ice-cap (1323); cold towel rub (1213) or cold mitten friction (1209).

11. **Cardiac Palpitation.**—Lavage (1401); ice-bag (1314) over heart 15 minutes every hour.

12. **Aortic Palpitation.**—Rest in horizontal position; ice-bag

(1314) over aorta; abdominal supporter when on feet; enema (1404) if colon is distended; gastric lavage (1401) if the stomach is foul.

13. **Anorexia.**— Graduated cold baths (1625); wet-sheet pack (1179) once or twice a week; short electric-light bath (1250) two to three times a week; sun bath (1254) daily; cold-air bath (733, 1470) daily; ice-bag over stomach half an hour before meals; cool sitz (1305); general and abdominal massage; manual Swedish movements; application of faradic or sinusoidal current to principal groups of muscles so as to cause contraction.

14. **Hiccough.**—Lavage (1401) when due to gastric irritation and stasis of food. Faradization, one electrode to spine, the other below ribs, right and left sides, of sufficient strength to contract the muscles strongly. Continue 5 to 15 minutes. Slowly sip half a pint of iced carbonated water; hold breath for half a minute; pressure with hands over the stomach, forcing the viscera up against the diaphragm. Hot and cold gastric compress (1362); ice-bag to back of neck; ice pills; ice-bag to epigastrium (664).

#### CONSTIPATION.

1. **Increase Peristaltic Activity.**— Drink half a pint to a 1524 pint of cold water before breakfast, preferably carbonated water. Increase bulk of food, with free use of fruit, especially apples, oranges, and figs. Granose is especially to be commended; also nut products, malted nuts, cereals, bran cakes, and figs. Small cold enema (1404); graduated enema (1409); fomentation (1328) over liver twice daily followed by heating compress (1344) during interval. Wet girdle (1347) at night. Abdominal massage. Cold fan douche (1061) to abdomen; cold percussion douche (1035) to spine. Cold plantar douche (1083) 1 to 3 minutes; cold rubbing sitz, 70° to 75° (1309), 5 to 20 minutes. Avoid complete emptying of colon, using small cold enema instead of a large quantity of warm water, except when necessary to relieve autointoxication, or remove hardened or impacted feces. If necessary, introduce into rectum, as high as possible, at night or before breakfast, to be retained till next stool, a small pledget of cotton saturated with raw linseed oil or with glycerin.

2. **Increase Activity of Intestinal Glands.**—Half a pint to a pint of water at bedtime, to be retained overnight; abdominal massage; wet girdle, without mackintosh (1347). Boracic acid powder before breakfast, introduction of absorbent cotton saturated with oil or glycerin at night or before breakfast.

3. **Remove Accumulated Fecal Matters.**—Large hot enema or coloclyster; neutral enema; warm soap enema; oil enema; glycerin enema (one part glycerin to four water) (1404). Repeat the application till bowel is thoroughly emptied, then inject a pint of water at 70° to 60° to tone the bowel.

4. **Dilatation of Colon.**—Graduated enema (1409); cold fan douche (1061) to abdomen and spine opposite; running cold foot bath (1296); cold rubbing sitz (1309); cold wet girdle, without mackintosh (1347), changing every 4 hours.

5. **Increase Strength of Abdominal Muscles.**—Cold fan douche (1061); cold plantar douche (1083); percussion abdominal douche (1081); cold abdominal compress (1318); renewed every 4 hours, without impervious covering; sinusoidal electricity; massage; special exercises, particularly head raising and legs raising while lying upon the back.

6. **Enteroptosis.**—Restore prolapsed bowels to position; strengthen abdominal muscles as indicated above; correct sitting position; abdominal supporter; replace viscera daily. See 1525.

7. **Hemorrhoids.**—Long cold sitz bath (1305); cool anal douche (1087); cold anal compress (1395); small cold enema (1405); if inflamed, rest in bed, fomentations over the nates followed by cold compress (1395). Repeat fomentations every 3 hours. Surgery if necessary.

8. **Pain.**—If due to *fissure*, hot applications; sitting over steam. If due to *irritable rectum*, hot irrigation (1410). For *pain in the abdomen*, revulsive compress (1341); Scotch douche (1037); hot enema at 110°, followed by small cool enema (1404); revulsive sitz (1311½).

9. **Relieve Spasm of Sphincter Ani Muscle.**—Prolonged neutral (1312) or hot sitz bath (1311); warm rectal irrigation (1410); hot rectal irrigation (1410); fomentations (1328) over the nates. Dilatation sometimes required.

10. **Restore Sensibility of Rectum.**—Alternate irrigation of the rectum (1410); cold douche to lower spine and nates (1076).

Shallow cold sitz (1305); cold anal douche (1087); alternate anal douche (1046); sinusoidal electricity to rectum.

**II. Contraindications.**—Sweating baths sometimes induce constipation (1176), also abuse of the fomentation and the habitual use of the warm enema, which should be strictly avoided. If the enema is used daily, the temperature, at least at the conclusion, should be 65° to 75°, so that a tonic effect may be secured.

**General Method.**—Each case must be carefully studied with reference to the leading cause or causes which are operative in the individual case. Most important of these are,—a paretic or atonic condition of the intestine through disturbed or defective innervation; diminished intestinal secretion or an abnormal absorption of intestinal secretion resulting in unusually dry and solid fecal mass; dilatation of the colon, giving rise to accumulation; relaxation and weakness of the abdominal muscles with lowered intra-abdominal tension; hemorrhoids and other diseases of the rectum; prolapse of the colon and other abdominal viscera; loss of normal sensibility of the rectum; spasm of the anal sphincter.

## ENTEROPTOSIS.

### *Etiological Indications.*

1525

1. Correct sitting and standing positions; corrective gymnastics and manual Swedish movements; sinusoidal electricity to muscles of the trunk. Avoidance of waist constriction by belts, corsets, or heavy skirts. Cold fan douche (1061) to abdomen; cold plantar douche (1083).

### *Pathological Indications.*

2. **Replace the Viscera.**—Replace viscera daily by abdominal massage, genu-pectoral position, inspiratory lifting, etc; abdominal supporter; combined support of abdomen and shoulders.

3. **Strengthen the Abdominal Muscles.**—Cold fan douche to abdomen (1061); cold plantar douche (1083; special exercises, particularly raising head, both legs, head and legs simultaneously or in alternation, inspiratory lifting; knee-chest position; electricity, applied so as to cause rhythmical contraction of abdominal muscles, preferably the slowly alternated sinusoidal current; swimming; Swedish gymnastics; abdominal massage.

**Clinical Indications.**

4. **Abdominal Tenderness and Discomfort.**—Fomentation (1328) twice daily; wet girdle (1347); abdominal supporter; hot enema followed by small cold enema (1404).

5. **Indigestion.**—Aseptic dietary (1626); massage to empty the stomach 2 hours after eating. Massage (1461) when required. See Hypopepsia and Dilatation of Stomach (1521, 1523).

6. **Pain between Shoulders.**—Fomentation (1328) to back; gastric heating compress (1344); abdominal supporter.

7. **Backache.**—Fomentation (1328); revulsive compress (1341); alternate sponging (1206) or compress (1340); heating spinal compress (1355); Scotch douche (1037); abdominal supporter.

8. **Neurasthenia.**—See 1554.

9. **Headache.**—See 1554, 11-15, 1562.

10. **Hysteria.**—See 1553.

11. **Nervous Asthma.**—Hot enema (1406); hot water drinking (a pint or more); fomentation to abdomen (1328); fomentation to back; wet girdle day and night (1347); hot and cold trunk pack daily (1367); abdominal supporter; galvanism to abdominal sympathetic; abdominal massage with replacement of viscera.

12. **Constipation.**—Graduated cold enema (1409). See 1524.

**General Method.**—General tonic treatment to improve innervation; special massage to restore viscera to position; a properly adjusted abdominal supporter; special gymnastics for exercising the abdominal muscles; the daily application of electricity as a means of passive exercise of the muscles of the abdomen and loins; and the cultivation of an upright and forcible attitude in sitting and standing, the abdominal muscles being well drawn in, are the essential features of the rational method of dealing with this disorder.

**GASTRIC ULCER.****526 Etiological Indications.**

1. Rest in bed; rectal feeding for 2 weeks, repeating after a few days if necessary; bland aseptic liquid diet (1626, 1628); avoid solid food, condiments, flesh foods.

***Pathological Indications.***

2. Revulsive compress (1341) three times a day, heating compress (1344) during intervals; hot fomentation (1328) or hot douche to spine (1074).

***Clinical Indications.***

3. **Pain.**— Revulsive compress (1341); gastric fomentation (1328); heat to spine (1335); hot-blanket pack to hips and legs (1393).

4. **Vomiting.**— Ice pills; carbonated water; lavage (1401) if stomach is foul and no recent hemorrhage.

5. **Hemorrhage.**— Rest in bed; ice-bag over stomach; hot hip and leg pack (1197). Withhold foods and drink by stomach. administering water and food by enema.

## NERVOUS DYSPEPSIA.

***Pathological Indications.***

1527

1. **Irritation of Solar Plexus and Abdominal Sympathetic.**— Fomentation (1328) twice a day; during interval, apply heating compress (1344), changing every 4 hours, except during sleep. Abdominal compress (1351) during the night; dry bandage (1353) during the day; abdominal supporter when enteroptosis exists.

***Clinical Indications.***

2. **General Weakness.**— Graduated cold baths (1625) twice daily; percussion douche to spine.

3. **Heartburn.**— Dry aseptic dietary (1626); gastric fomentation (1328) followed by heating compress (1344).

4. **Eructations and Regurgitations of Food.**— Fomentation (1328) over the stomach twice daily; continuous heating compress (1344) during the interval, without impervious covering, renewing every 4 hours.

5. **Spinal Irritation.**— Fomentation (1328) at night followed by heating spinal compress (1355) to be worn during the night; wet girdle (1347).

6. **Cold Extremities.**— Scotch douche (1037); running cold foot bath (1296); leg pack (1393); massage (1461).



7. **Headache.**— Hot and cold head compress (1358); alternate spinal sponging (1342), cool compress if congestion is present; massage to head and neck.

8. **Anorexia.**— Ice-bag over stomach half an hour before eating; cold spinal douche (1074); cold air bath (733, 1470); out-of-door life; small cold enema before breakfast, retained.

9. **Abdominal Weight and Tenderness.**— Abdominal supporter; hot fan douche (1063) to abdomen; hot foot bath (1297); revulsive sitz (1308); fomentation (1328) twice daily, followed by heating compress (1344).

10. **Excessive Peristalsis.**— Hot and cold abdominal compress (1356); abdominal fomentation twice daily, followed by wet girdle (1347) protected with mackintosh; abdominal supporter.

11. **Asthma** — Nervous or reflex asthma, is commonly associated with dilated or prolapsed stomach, and irritable lumbar sympathetic ganglia. The most important palliative measures are the hot and cold trunk pack (1367); fomentation (1328) over abdomen twice daily, followed by heating compress (1344) to be worn during intervals; hot enema (1406); hot immersion bath (1126); general tonic treatment (1625); Scotch douche to legs. See Enteroptosis (1525) and Dilatation of the Stomach (1523).

**General Method.**— The general method consists in improving the nerve tone, allaying general nervous irritability, lessening gastric irritation and improving the general nutrition by the appropriate measures as indicated above.

#### ACUTE GASTRO-INTESTINAL CATARRH IN CHILDREN, 1528 CHOLERA INFANTUM, SUMMER DIARRHEA

1. Withdraw all food; hot-blanket pack (1197) till skin is reddened; follow by cold mitten friction (1209) or cold wet-hand rubbing (1213). If temperature is high, heating wet-sheet pack (1183), repeated if necessary. Rest in bed.

2. **Persistent Vomiting.**— Gastric lavage (1401); ice-bag (1314) to stomach.

3. **Frequent Stools.**— Hot enema (1406), at 105° to 110° after every stool; fomentation (1328) to abdomen every 3 hours, followed by heating compress (1344), changing every 20 minutes.

4. **Pain in Abdomen.**— Revulsive abdominal compress (1341) for 15 to 20 minutes every hour or two.

5. **Collapse.**—Hot-blanket pack (1197) until warm, followed by prolonged neutral bath (1130) at 92° to 95°. Hot water drinking (1424); large warm (98°) enema (1406).

#### CHRONIC INTESTINAL CATARRH, CHRONIC DIARRHEA.

##### *Pathological Indications.*

1529

1. **To Lessen Congestion.**—Rest in bed. Enema (1404), 95°, after each stool, followed by half a pint of cold water. Fomentation (1328) to abdomen twice daily, 15 minutes; during interval, heating abdominal compress (1351) renewed every 2 hours. The heating compress should be covered with flannel only.

2. **To Discourage Bacterial Growth.**—Aseptic dietary, especially fruit juices, purées, dextrinized cereals, kumyss, beaten eggs. Cleanse colon by large hot enema daily, following by small enema (pint) of gallic or tannic acid solution (dram to pint).

3. **To Combat Weakness and Autointoxication.**—Short sweating baths, 3 to 8 minutes, and graduated cold baths (1625).

##### *Clinical Indications.*

4. **Pain in Abdomen with Tenderness.**—Fomentation (1328) to abdomen every 2 to 3 hours; hot enema (1406), 110°, after each stool; heating abdominal compress (1344) after each hot application, to be changed once an hour until the next hot application is made.

5. **Gas in Intestines.**—See 1520, 8.

6. **Gastric Symptoms.**—See 1520–1523.

7. **Neurasthenic Symptoms.**—See 1554.

8. **Mucous Stools.**—Large hot enema (1404) at 95° followed by small cold enema (1405); cold abdominal compress (1318) changed every hour. Revulsive sitz (1308) or compress to abdomen (1341); Scotch (1037) fan douche (1061) to abdomen.

9. **Frequent Stools.**—Abdominal compress as above; prolonged cool sitz (1309) at 75°, 15 minutes, followed by short hot affusion (1103) to spine, and wet-sheet rub (1216).

10. **Alternating Constipation and Diarrhea.**—Large warm (98°) soap enema (1406), or colocylyster (1407), once or twice a week; follow with small cold enema (1405); wet girdle (1347).

**11. Contraindications.**— Cold douche, protected heating compress, prolonged fomentations.

**General Method.**— Increase the general vital resistance and improve gastric conditions, regulating the diet so as to render the intestine an unfavorable habitat for the bacteria which constitute the chief cause of this disease; remove bacteria and masses of mucus and pseudomembrane by neutral enemas (1404), and follow by small enemas of gallic or tannic acid solution, which destroy the germs associated with this disease.

### 1530 ACUTE DYSENTERY, COLITIS.

1. Free water drinking (1423); an aseptic dietary; no animal broths or meat preparations (1626). Browned rice, kumyss, buttermilk, fresh ripe fruit, fruit juices, with well-dextrinized cereals (1630), are proper foods.

2. **To Combat Visceral Inflammation.**— Hot-blanket pack, (1197) with hot hip and leg pack (1197), followed by heating abdominal compress (1344), 60°, changed every 20 to 40 minutes; ice suppositories if the inflammation extends into the rectum. Cold sitz (1305), 75°, 15 to 30 minutes, with hot foot bath (1297). Cold irrigation of the rectum (1410). Rest in bed.

3. **To Relieve Pain.**— Very hot pelvic pack, with hot foot bath (1297); very hot enema (1406), 110°, followed by cold rectal irrigation (1410); repeat hourly if required.

### 1531 CHRONIC DYSENTERY, CHRONIC COLITIS.

Rest in bed; aseptic dietary (1626); graduated cold baths (1625) twice daily; cold rubbing sitz (1309); hot revulsive sitz bath (1311), 6 to 10 minutes daily, immediately preceded by a hot enema (1406).

If much pain is present, revulsive sitz (1308, 1311) once or twice a day. Moist abdominal bandage (1347).

### 1532 CHOLERA MORBUS.

1. Secure physiological rest of stomach and bowels by withholding food. Rest in bed.

2. **Vomiting.**— Ice-bag (1314) over stomach. Ice pills; ice compress to the throat. (1314). Fomentation (1328) to spine; ice-bag (1314) to spine; hot and cold trunk pack (1367); lavage (1401).

3. **Diarrhea.**— Hot enema (1406) after each stool; fomentation (1328) over abdomen every 2 hours, duration 20 minutes during interval, heating compress (1344) at 60°, renewed every 30 minutes. If the temperature is above 102°, prolonged neutral bath (1130) or hot-blanket pack (1197) followed by cold friction (1209) or cold towel rub (1213).

4. **Collapse.**— Hot-blanket pack (1197) 15 minutes, followed by cold mitten friction (1209).

5. **Cardiac Weakness.**— Ice-bag (1314) over heart.

#### APPENDICITIS.

1533

1. Withhold food. Rest in bed. Large hot enema (1406), repeated every 6 hours; fomentation (1328) 15 minutes every hour; during interval, heating compress (1344) at 60°, changed every 10 minutes. As inflammation is subdued, prolong interval between fomentations, and change cold compress less frequently. Fomentation at night followed by heating compress over affected region (1344) for several months, if necessary.

2. **Intestinal Obstruction.**— Large hot coloclyster (1407); hot bath (1126). If speedy relief is not obtained, surgical measures should be employed.

#### JAUNDICE.

1534

##### A. Catarrhal Form.

1. **General.**— Cold mitten friction (1209); cold towel rub (1213); rest in bed; aseptic diet (1626).

2. **Pain.**— Fomentation (1328) over stomach and liver for 15 minutes every 2 or 3 hours; during interval, heating compress (1344) at 60°, renewed every 30 minutes. Copious hot enema (1406), 110°, twice a day. After discharge of hot-water, an enema of one pint water at 70°. Hot trunk pack (1197); hot immersion bath (1126) 104°, 10 min.; cold towel rub (1213), or wet sheet rub (1216).

3. **Fever.**— Sweating wet sheet pack (1191); vapor bath (1246); electric light bath (1250); copious water drinking (1423).

4. **Headache.**— Hot and cold head compress (1358); evaporating head compress (1324); cold cephalic compress (1371); hot sponging (1204) of back of neck.

5. **Itching.**— Neutral saline bath (1464); hot sponging (1204).

6. **Chill.**— Hot water drinking (1429); dry pack (1192).
7. **Gastric Catarrh.**— See Chronic Gastritis 1520.

#### **B. Biliary Colic — Gall-stone.**

1. **General.**— Fruit diet (1627); water drinking (1423); liquid aseptic dietary (1628).
2. **Pain.**— Revulsive compress (1341) every two hours; continuous hot applications to hepatic region; hot colocyler (1407), or enema (1406), every 2 hours; hot immersion bath (1126).
3. **Fever.**— Prolonged neutral bath (1130); hot-blanket pack (1197) followed by wet-sheet pack (1216); cold mitten friction (1209) or cold towel rub (1213).
4. **Nausea and Vomiting.**— Lavage (1401) if persistent. See 1519, 3.
5. After acute attack, administer treatment for Gastro-intestinal Catarrh. See 1529.

#### **CIRRHOSIS OF THE LIVER.**

##### **1535 *Etiological Indications.***

1. Avoid tea, coffee, tobacco, alcoholics, condiments. Aseptic dietary (1626).

##### ***Pathological Indications.***

2. **Organic Changes in Liver.**— Alternate douche (1044), alternate compress (1340); Scotch douche (1037); flannel-covered heating compress (1344). Follow local application by general douche (1010,) or wet-sheet rub (1216).

##### ***Clinical Indications.***

3. **Pain.**— Fomentation (1328); revulsive compress (1341) or douche (1041), with hot leg bath (1299) or pack (1393) followed by compress (1344), twice a day.
4. **Jaundice.**— Wet sheet pack (1179) followed by wet sheet rub (1216); electric-light bath (1250) followed by graduated shower (1047) or wet-sheet rub (1216).
5. **Dropsy.**— Scotch douche (1037) to legs and abdomen; trunk pack (1349); strong faradic application to abdomen.
6. **General Weakness.**— Carefully graduated tonic baths (1625); neutral bath (1130); neutral galvanic bath (1451); sun baths (1254); out-of-door life.
7. **Contraindications.**— Cold immersions and very cold general or prolonged cold douche.

**RENAL COLIC.**

1. **During Attack.**— Rest in bed; diet of fruit (1627), kumyss, 1536 or buttermilk; hot water drinking (1423); hot enema (1406), repeat every two hours; hot immersion bath (1126) cold to head and over the heart, if the bath is greatly prolonged; hot trunk pack (1197) renewed hourly; revulsive sitz (1308); cold precordial compress (1383) if heart is weak or much excited.
2. **To Prevent Attacks.**— Combat lithemia. See 1511.
3. **Vomiting.**— Ice pills; ice to throat.
4. **Urinary Suppression.**— Hot-blanket pack (1197) followed by dry sweating pack (1192).

**ACUTE NEPHRITIS.*****Pathological Indications.***

1537

1. **Relieve Renal Congestion.**— Congest the skin by means of the hot trunk pack (1197), hot-blanket pack (1197), or hot immersion bath (1126) continued to perspiration, followed by friction, avoiding deep massage procedures. Rubbing until vigorous perspiration is induced. Maintain active cutaneous circulation; fomentation to loins for 30 minutes every 3 or 4 hours, heating lumbar compress (1344) during interval.
2. **Encourage Renal Activity.**— Ice-bag (1314) over lower third of sternum; hot enema (1406); hot water drinking (1429); prolonged neutral bath (1130).
3. **Encourage Elimination of Toxins.**— Hot (1406) or cold enema (1405) twice daily. Prolonged hot-blanket pack (1197); sweating wet-sheet pack (1191); electric-light bath (1250); vapor bath (1246); copious water drinking (1423).

***Clinical Indications.***

4. **Nausea.**— Hot and cold gastric compress (1362); ice-bag over the stomach (1314); sipping very hot water (1429).
5. **Diet.**— Fruit juice; fruit purées; buttermilk or kumyss.
6. **Cardiac Weakness.**— Ice-bag (1314) over heart for 15 minutes every 2 hours; cold mitten friction (1209); cold towel rub (1213) 2 or 3 times daily.

7. **Contraindications.**—Prolonged general cold applications, Brand bath, cold douche, cold affusion.

**General Method.**—Absolute rest in bed; maintaining a warm and active skin even to the extent of perspiration; an aseptic, liquid dietary (1628) to encourage free diuresis, copious water drinking.

#### CHRONIC NEPHRITIS, BRIGHT'S DISEASE.

**1538** 1. **General.**—Aseptic dietary (1626); especially avoid meats and condiments; buttermilk or kumyss diet or exclusive fruit diet (1627) during acute attack; tea, coffee, tobacco, and alcoholic liquors to be strictly avoided.

2. **Maintain activity of skin** by warm woolen clothing, dry friction (1221), applied daily; cold mitten friction (1209) followed by dry friction (1221); oil rubbing (1232). Carefully graduated cold applications (1625). Electric-light bath (1250) followed by cold towel rub (1213). Sweating bath (1197) twice a week at bedtime, followed by cold mitten friction (1209).

3. **Acute Exacerbation.**—Apply treatment recommended for acute Bright's disease (1537).

4. **Dropsy.**—Short electric-light bath (1250), followed by cold mitten friction (1209) or cold towel rub (1213), water drinking (1423), one to two pints twice daily; effervescent bath (1139).

5. **Contraindications.**—Cold immersions, prolonged cold douche, frequently repeated, or prolonged hot baths.

**General Method.**—The essential features are a carefully regulated regimen adapted to the patient's condition, warm clothing, avoidance of chill, frequent neutral baths (1130), very gentle tonic measures, copious water drinking (1423), perfect digestion and bowel action, an aseptic dietary (1626), out-of-door life, avoidance of exposure to cold and excesses of every description especially sexual and dietetic excesses.

#### CYSTITIS AND IRRITABLE BLADDER.

**1539** 1. **Inflammation.**—Copious water drinking (1423), revulsive sitz (1308) twice a day; hot leg packs (1393) followed by dry heat to legs; neutral bath (1130) 20 to 40 minutes two or three times a week; prolonged neutral sitz (1312); cold friction; cold towel rub (1213); fomentation (1328) over bladder; bladder irriga-

tion (1411); hot enema (1406); hot pelvic pack (1390); aseptic dietary (1626).

2. **Irritable bladder**, inflammation not present. Very hot sitz (1311) for five minutes, followed by neutral sitz (1312) for 10 to 20 minutes. Hot pelvic pack (1390); heating compress (1344) over perineum and genitals; revulsive sitz (1308); hot rectal irrigation (1410).

3. **Contraindications**.—Cold sitz, cold immersion, cold douche, cold foot bath.

#### INCONTINENCE OF URINE.

1. **To Increase Energy of Bladder**.—Cold plantar douche (1083) 1 to 2 minutes; cold running foot bath (1296); cold percussion douche (1035) to hips and legs, 60° to 65°; cold douche (1076) to lumbar region; cold fan douche (1061) at 65° over bladder. Cold rubbing sitz (1309). Irrigation with normal saline or boracic acid solution; begin at 100°, and lower temperature 1° daily to 80°.

2. **Relieve Vesical Irritation**.—Revulsive sitz (1308); hot pelvic pack (1390); prolonged neutral sitz (1312) following revulsive sitz (1308). Neutral douche to lower spine (1103); Scotch douche to feet and legs (1037); hot bladder irrigation, 100°–115°.

3. **Improve General Nerve Tone**.—Cold mitten friction (1209) or cold towel rub (1213); cold pelvic pack (1390); general cold douche (1010); shallow bath (1174); wet-sheet rub (1216).

#### NOCTURNAL INCONTINENCE IN CHILDREN.

1. **Improve General and Local Nerve Tone**.—Cold affusion (1103) at 75° at bedtime, followed by neutral pour (1103) to spine, 2 minutes, 96°. Sea-bathing (1147) and swimming. Avoid water drinking for 2 hours before retiring. Aseptic dietary (1626). Meats and salt especially to be avoided.

2. **Relieve Constipation** and flatulence when present by wet girdle (1347), graduated enema (1409); if necessary, carefully graduated cold baths (1625); cool enema (1405), and proper diet.

3. **Diminish Acidity of Urine**, by free use of fruit and water drinking in the forenoon.



**PERITONITIS.****A. Acute Form.**

- 1542** 1. Rest in bed; fluid diet; fruit-juice without sugar; gruels of dextrinized or malted cereals (1630); withhold food 24 to 48 hours.
2. **Albumin in Urine.**— Hot-blanket pack (1197) and other sweating measures to maintain cutaneous activity, repeated every 2 to 4 hours.
3. **Fever.**— Hot-blanket pack (1197) followed by cold mitten friction (1209); prolonged neutral bath (1130); fomentation (1328) to abdomen with cooling wet-sheet pack (1189) at the same time.
4. Enema (1404) at 80°, repeating, to remove gas; add soap to water if necessary to secure movement. Fomentation (1328) every 2 hours for 15 to 20 minutes. During interval, heating compress (1344) at 60°, changing every 5 minutes while the body temperature is elevated, less frequently as temperature falls. Copious water drinking (1423); prolonged neutral bath (1130); cold precordial compress (1383) or ice-bag (1314) over heart for 15 minutes 2 or 3 times a day for cardiac weakness.
- Prevent Obstruction.**— Large enema (1404) three times a day from beginning, temperature 75°; soap and turpentine enema.

**B. Chronic Form.**

Aseptic dietary (1626), liquid diet (1628). Hot enema (1406) followed by fomentation (1328) to abdomen for 20 minutes, three times daily; well-protected heating compress (1344) during the interval. Copious water drinking (1423); graduated cold applications twice daily (1625). If temperature is elevated, neutral bath (1130) half an hour to an hour daily.

**Contraindications.**— Cold immersions, prolonged cold douche, cold affusion, cold wet-sheet rub, and cold sitz.

**NEURITIS.****1543 Etiological Indications.**

1. Rest of affected parts until acute stage is over.
2. **Combat Toxemia.**— Sweating bath two or three times a week, preferably the electric-light bath (1250); follow sweating bath by a suitable cold application (1625).

**Pathological Indications.**

3. **Combat Inflammation.**—Local revulsive compress (1341) for 15 minutes every 2 to 4 hours, followed by heating compress (1344) during intervals; suitable derivative applications (682).

**Clinical Indications.**

4. **Pain.**—Scotch douche (1037); vapor douche (1102) followed by graduated fan douche (1061), gradually reduced from 100° to 80°; protect by dry cotton pack (1388) or heating compress (1344) covered with mackintosh.

5. **Paralysis.**—Alternate compress (1340); alternate douche (1044); percussion douche (1035) to spine and affected parts.

## MULTIPLE NEURITIS.

**Etiological Indications.**

1544

1. Rest in bed while the disease is rapidly progressive.

2. **Combat Toxemia.**—Prolonged neutral bath 1 to 2 hours, daily. Aseptic dietary (1626); avoidance of tea and coffee, tobacco and alcoholic liquors, and all excesses. Sweating, especially by electric-light bath (1250), 10 to 20 minutes, followed by cold mitten friction (1209).

3. **Combat Local Inflammations.**—Revulsive compresses, then heating compress or packing in dry cotton (1388); fomentations to spine, followed by heating compress. When affecting the lower extremities, hot foot or leg bath (1299); hot leg pack (1393); complete rest of the affected part.

4. **Improve the General Nutrition** by graduated cold baths (1625); massage; galvanic neutral bath (1451); out-of-door air with careful protection; sun baths (1254); aseptic diet (1626).

5. **Pain.**—See 1543, 4.

6. **Paralysis.**—See 1543, 5.

7. **Atrophy.**—Alternate douche (1044); galvanism or sinusoidal electrical current; massage; manual Swedish movements.

**Contraindications.**—During acute stage, carefully avoid cold applications unless very short and preceded by heat; avoid percussive applications so long as tenderness exists, that is, all forms of the douche. Avoid especially cold immersion baths, and very prolonged hot baths.

## NEURALGIA.

**1545 Pathological Indications.**

1. **Combat Toxemia when Present.**—Sweating bath followed by appropriate general cold bath (1625) three times a week; the electric-light bath (1250), vapor bath (1246), sweating wet-sheet pack (1191), are especially serviceable. Copious water drinking (1423); aseptic dietary (1626); dry friction (1221) of skin or oil rubbing daily after short sweating bath (1250), followed by tonic cold application (1625).

2. **Combat Anemia and General Weakness.**—Graduated cold applications (1625). Avoid increasing pain by preceding or accompanying the cold bath by a hot application to the affected part; cover or avoid the part during the cold application.

**Clinical Indications.**

3. **Pain.**—Fomentation (1328) or revulsive compress (1341) to the seat of pain. Scotch douche (1037) or alternate douche (1044); ice-bag (1314) sometimes more effective than heat. This is often the case when the parts are congested as shown by redness of the skin or throbbing sensation, and also when the nerves affected are extremely superficial.

4. **Reflex Neuralgias.**—Usually due to enteroptosis or hyperesthesia of the lumbar ganglia. Fomentation (1328) to abdomen twice daily; wet girdle (1347) during intervals; abdominal supporter. Avoid chilling after baths, and general prolonged cold applications, such as immersions, shallow and wet-sheet pack.

5. **Neuralgia of the Head.**—Employ derivative measures, as hot sitz bath (1311); hot leg bath (1299); hot pack to legs (1393); hot foot bath (1297); cold running foot bath (1296); heating wet-sheet pack (1183); fan douche to head (1061); hot and cold compress to head (1358); heat over the seat of pain. Fomentation (1328) to the abdomen twice daily, followed by heating compress (1344); very hot application to forearm of opposite side.

6. **Spinal Neuralgia and Lumbago.**—Fomentation (1128) to spine two or three times a day; during interval, heating compress (1344); hot and cold spinal pack (1369). Alternate compress (1340); Scotch douche (1037); hot trunk pack; hot half blanket pack; spinal fomentation with hot leg bath; rest.

7. **General Neuralgic Pain.**—Hot immersion bath (1126) 4 to 5 minutes followed by prolonged neutral bath (1130), 95°; hot-blanket pack (1197), electric-light bath (1250), vapor bath (1246) or sweating pack (1191) followed by dry pack (1192).

8. **Neuralgia due to Chronic Neuritis.**—Alternate compress (1340) or douche (1044); filiform douche (1064). In sciatica, Scotch douche, if persistent; nerve-stretching.

9. **Neuralgic Affections of Ovaries, Uterus, Rectum, Bladder, and Coccyx.**—Revulsive sitz (1308); hot pelvic pack (1390), followed by cold mitten friction (1209); hot enema (1406); hot vaginal irrigation (1413); hot and cold pelvic pack (1370, 1390); revulsive compresses over affected parts (1341).

10. **Gastralgia.**—Very hot fomentation (1328) over stomach and abdomen; hot trunk pack (1196); revulsive compress (1341) for 10 to 30 minutes over stomach, repeated every 2 hours, or as often as needed; hot leg pack (1393); hot water drinking (1429); hot enema (1406). Withhold food until pain is relieved. Aseptic diet (1626); if necessary, liquid diet for a few days (1628).

11. **Enteralgia.**—Abdominal fomentation (1328) 15 minutes every hour; hot enema (1406); heating compress (1344) applied at 60° during interval; graduated tonic treatment (1625).

12. **Erythro Melalgia—Red Neuralgia.**—Rest; elevation of the affected part. Cold compress (1318) changed every 20 to 30 minutes. Application of faradic current and the rapidly alternated sinusoidal current. Graduated tonic treatment (1625).

13. **Herpes Zoster.**—During eruption, dry cotton pack (1388); after, revulsive compress (1341) several times daily, heating compress (1344) during interval.

14. **Contraindications.**—Cold applications increase pain unless very carefully graduated, but are usually necessary for a permanent cure.

#### ACUTE MYELITIS

##### *Pathological Indications.*

1546

1. **Combat Inflammatory Process in Cord.**—Ice-bag (1314), continuously, changing for fomentations 5 min. every half-hour. Revulsive compress (1341) to the spine; fomentation (1328) for 20 minutes every 3 hours, during interval. Heating compress (1344) to spine, 60°, renewed every 15 minutes.

2. **After Acute Stage Has Subsided.**— Alternate compress (1340), or alternate douche (1044) to spine three times a day.

**Clinical Indications.**

3. **Pain and Paresthesia in Legs.**— Hot leg pack (1393); hot foot bath (1299); hot half-bath (1174); revulsive compress (1341) to spine several times daily, duration 15 to 60 minutes.

4. **Girdle Sensation.**— Hot trunk pack (1197) followed by cold friction (1209); wet girdle, well-protected (1347); fomentation to spine followed by heating spinal compress (1355).

5. **Neuralgic Spinal Pain.**— Fomentation (1328) or hot sponging (1204) of spine followed by heating compress (1344).

6. **Paraplegia.**— Alternate compress (1340) or fan douche (1061) to spine and legs; massage; galvanic, faradic, or sinusoidal electrical applications.

7. **Sensory Paralysis.**— Alternate spray (1044, 1055); alternate sponging (1204); alternate compress (1340); percussion douche (1035) twice daily. Static or faradic electricity.

8. **Muscular Spasm.**— Revulsive compress (1341) to spine. Fomentation (1328) over irritated muscular groups, followed by continuous heating compress (1344), repeating twice daily or as often as necessary; heating spinal compress (1355).

9. **Hiccough.**— See 1523, 14.

10. **Gastric Crises.**— Hot and cold trunk pack (1367); revulsive gastric compress (1341); fomentation (1328) to spine; hot foot bath (1297); hot leg pack (1393); hot immersion (1126) or hot sitz (1311); galvanism to back of neck and epigastrium.

11. **Contraindications.**— Cold immersion and other general cold applications. Carefully avoid burning or blistering the patient with hot applications.

**CHRONIC MYELITIS.**

**1547 Pathological Indications.**

1. Short sweating procedures, followed by graduated cold applications (1625) twice a day. Revulsive compress (1341) or fan douche (1061) to spine, temperature, 120°, 70°; prolonged neutral (92°) immersion baths (1130), 1 to 6 hours; heating compress to the spine (1355). Later stages, alternate douche or compresses to the spine (1342.)

**Clinical Indications.**

2. **Prickling Sensation in Legs.**—Scotch douche (1037), hot fomentations or affusion (96°) (1328) to spine and legs.

3. **During early stage** and exacerbations, neutral pour (1103) to spine, 96°, two to ten minutes, two or three times daily; absolute rest in bed; spinal fomentation every four hours, heating compress during intervals.

4. **Contraindications.**—Cold full bath, very cold douche, cold affusion, and all prolonged general cold applications.

1548

**SPINAL SCLEROSIS.****A. Lateral Sclerosis — Postero-Lateral Sclerosis — Disseminated Sclerosis.****Pathological Indications.**

1. **To Improve General Nutrition and Blood Movement.**—Graduated tonic baths (1625); massage carefully administered; manual Swedish movements; nutritious aseptic dietary (1626); sweating baths, especially the electric-light bath (1250) followed by cold mitten friction (1209), carefully administered; copious water drinking (1423).

2. **To Combat Local Morbid Processes.**—Fomentation (1328) to the back twice daily, followed by heating spinal compress (1355.) The heating compress may be applied at night and retained until morning. Hot leg bath (1299) with fomentation to the spine; prolonged neutral bath (1130), 1 to 4 hours daily.

**Clinical Indications.**

3. **To Relieve Clonic Spasm and Nervous Irritability.**—Warm bath (96° to 100°); prolonged neutral affusion to the spine (93° to 98°) heating spinal compress (1355) at night; neutral galvanic bath (92° to 98°) (1451), 10 minutes; galvanism of the dorsal spine and abdominal sympathetic with simultaneous spinal fomentation. Rest in bed when symptoms are progressing.

4. **For Muscular Weakness or Paralysis.**—Massage; manual Swedish movements; exercise of muscles by slowly alternated sinusoidal electrical current. Special gymnastics.

5. **Contraindications.**—The cold douche and other general cold baths; prolonged hot baths; exercise to the extent of fatigue.

The patient should be kept in the open air as much as possible. Out-of-door gymnastics are especially useful.

#### B. Amyotrophic Lateral Sclerosis.

1. See (A) 1, above.
2. Prolonged neutral baths (1130), 1 to 3 hours daily; massage; manual Swedish movements.
3. **Contraindications.**—Avoid the use of electricity, the cold douche, prolonged hot baths, and general cold baths.

**General Method.**—Build up the general health by gentle tonic measures slowly increased in intensity (1625), suppressing the formation of toxic substances and promoting their elimination by a suitable dietary (1626), improvement of digestion and the employment of the other measures above indicated.

By the suppression of the active causes of the disease and the adoption of rational means for the improvement of general nutrition and especially of the nutrition of the cord, it is usually possible to arrest the disease, and not infrequently a considerable degree of improvement may be secured. Therapeutic measures must be most thoroughly and perseveringly employed. The progress of the disease may be delayed, even when it can not be altogether arrested.

#### LOCOMOTOR ATAXIA.

- 1549 1. **Improve General Nutrition.**—Careful cold mitten friction (1209) or cold towel rubbing (1213). Very carefully graduated cold baths (1625). Tonic pack (1179), protecting the spine by a dry towel, followed by cold friction (1209) and affusion (1103) or half-bath at 85° (1174).
2. **Combat Toxemia** by short sweating baths (1191, 1246, 1250), followed by appropriate graduated cold baths (1625). Prolonged neutral bath (1130), beginning at 96° and daily lowering the temperature to 90°; increase duration from 30 minutes to 2 or 3 hours daily. Copious water drinking (1423); coloclyster daily (1407).
3. **Improve Nutrition of Cord.**—Fomentation (1328) to the spine 110° to 120° twice daily, with heating compress (1355) during the interval. Thorough massage of the back; suspension, or spine-stretching by flexion of the trunk upon the thighs, or flexion of the thighs upon the trunk.

**Clinical Indications.**

4. **Ataxic Movements.**— Special exercises in small movements of each of the affected muscular groups.

5. **Lightning Pains.**— Prolonged warm fan douche to spine (1103), 95° to 100°, two or three times a day (pressure 2 to 5 lbs.).

6. **Gastric Crises.**— Very hot fomentation to the abdomen (1328) several times a day, followed by heating compress (1344) when lumbar ganglia are sensitive; continue for several weeks. Revulsive gastric compress (1341). See 1545, 10.

7. **Local Pains.**— Revulsive compress (1341) and Scotch douche (1037) followed by heating compress (1344).

8. **Rectal Pain.**— Very hot anal douche (1087), 115° to 122°, with little pressure. Revulsive sitz (1308). Fomentation (1328) over buttocks. Hot rectal irrigation (1410).

9. **Paresis of Bladder.**— Daily irrigation (1411). Cold planetary douche (1083).

10. **Constipation.**— See 1524.

11. **Trophic Changes — Charcot's Joints.**— Fomentation (1328) to the parts when painful, three times daily, with heating compress (1344) during the intervals. Apply mechanical support when necessary. Galvanism and the rapidly alternating sinusoidal electrical current.

12. **Contraindications.**— Cold immersions, cold applications to spine, general cold douche, very hot applications.

**General Method.**— Build up the patient's general health by gentle tonic measures, carefully avoiding such applications of cold water as are found to increase pain or aggravate other symptoms; combat the local morbid process in the spine by the measures above indicated, and restore the power of co-ordinated movement in the affected muscular groups by special gymnastic training.

**CEREBRAL APOPLEXY.**

1. **During Attack.**— Rest, head and shoulders raised; cold 1550 compress to head (1371); tepid enema (1404); warm extremities by hot-water bags or hot pack. Ice-collar (1316).

1. **After Attack.**— Cold mitten friction (1209) twice daily; well-protected wet girdle (1347) night and day; carefully graduated cold baths (1625); prolonged neutral bath (1130); wet-sheet pack (1179). After a few weeks, electricity to affected muscles; man-



ual Swedish movements; carefully graduated exercises; massage; cold or alternate douche (1044) to affected muscles.

### EPILEPSY.

- 1551** 1. Abstemious, dry, aseptic dietary (1626), chiefly fruits and grains; vigorous out-of-door exercise to the extent of fatigue daily. Prolonged neutral bath (1130) daily; sweating process (642, 1233-1255) two or three times a week; graduated cold procedures (1625), avoiding prolonged and intense applications.
2. **When Attack Is Threatened.**—Coloclyster (1407) twice daily; copious water drinking (1423); neutral pack (1182); ice to head (1314); rest in bed. If aura in hand or foot precedes attack, the seizure may sometimes be averted by placing the part in cold water.
3. **After Attack.**—Rest; cold to head; cold mitten friction (1209) or cold towel rub (1213); half-bath (1174); Scotch douche (1037) to legs, and percussion douche (1035) to spine.
- General Method.**—Train the patient to a vigorous regimen, a simple abstemious dietary (1626), abundance of outdoor exercise, the daily employment of the prolonged neutral bath (1130); followed by short, moderately cold applications (1625); copious water drinking (1423); regulation of all the vital functions, avoidance of all sources of nervous irritation and exhaustion.

### CHOREA.

#### **1552** *Etiological Indications.*

1. Combat anemia and improve general nutrition by graduated tonic applications (1625); copious water drinking (1423); large enema or coloclyster (1407). Fomentation to abdomen (1328) morning and night, heating compress during intervals. Secure mental quiet by isolation if necessary. The patient should be kept in the open air. Out-of-door life and rhythmical gymnastics are especially useful.

#### *Clinical Indications.*

2. **Insomnia.**—Prolonged neutral bath (1130) or douche (1031); wet girdle (1347).
3. **Agitation.**—Neutral spinal pour (1103); wet-sheet pack (1179).

4. **Constipation.**— See 1524.
5. **Indigestion.**— See 1520-1525.
6. **Irregular Movements.**— Neutral pour to spine (1103) daily; prolonged neutral bath (1130); special gymnastics.
7. **Endocarditis.**— Ice-bags over the heart (1314). See 1576.

**General Method.**— Improve the nerve tone by tonic measures and careful attention to nutrition. Train the patient to better mental and moral control, and combat the choreic movements by systematic gymnastic training.

## HYSTERIA.

**Pathological Indications.**

1553

1. Tonic, reconstructive, and sedative measures. Graduated cold applications (1625) are of the first importance; must be carefully managed at first; application twice daily, short, intense. Prolonged neutral bath (1130) in cases due to autointoxication. Out-of-door life; generous aseptic diet (1626); suitable moral and mental surroundings.

**Clinical Indications.**

2. **Convulsions.**— Neutral bath (1130); neutral pack (1182); hot-blanket pack (1197); hot and cold spinal compress or sponging (1342); hot enema (1406); hot half-bath (1174) with tepid affusion (1103) to head and spine; heating spinal compress (1355).
3. **Coma.**— Alternate compress or sponging to spine (1342); cold mitten friction (1209); hot half bath (1177); cold, or hot and cold, compress to head (1358).
4. **Vomiting.**— Hot and cold gastric compress (1362); dry diet (1629); rectal feeding; gastric lavage (1401); ice to the epigastrium; (1314) ice pills.
5. **Anorexia.**— Ice-bag (1314) over stomach half an hour before meals; alternate compress (1340) to epigastrium, twice daily. Alternate lavage (1401); cold douche (1074) to spine and epigastrium (1079).
6. **Cough.**— Fomentation (1328) to spine; sipping hot water (1429); chest pack (1373). Cold compress to the throat (1381); gargling hot water (1400) several times daily.
7. **Muscular Paralysis.**— Alternate affusion or douche (1044, 1103); alternate compress (1340); cold affusion (1103);

cold douche (1047); massage douche (1066); massage; manual Swedish movements; electricity.

8. **Contractions.**—Fomentations to affected parts (1328) followed by heating compress (1344). Revulsive douche (1041).

9. **Trembling.**—Neutral affusion (1103) to spine, 92° to 96° 15 minutes.

10. **Incontinence of Urine.**—Percussion douche (1035) to spine; neutral sitz (1312) 15 to 30 minutes.

11. **Retention of Urine.**—Hot sitz (1311), 5 minutes, followed by cold plantar douche (1083). Cold perineal douche (1084); cold douche to the lumbar region (1076) and hypogastrium (1079); cold rubbing sitz (1309).

12. **Anesthesia or Paresthesia.**—Alternate douche (1044) or compress (1340); cold percussion douche (1035) to spine; cold rubbing of affected part with hand or friction mitt (1209) after a hot fomentation (1328) for 5 to 10 minutes.

13. **Hyperesthesia—Pain.**—Hot fan douche (1061); fomentation (1328) followed by heating compress (1344); revulsive compress (1341). Cold douche to the symmetrical part of the opposite side (1022).

14. **Loss of Muscular Sense.**—Alternate douche (1044); massage douche (1066); cold percussion douche (1035).

15. **Visceral Neuralgia.**—Very hot fomentation (1328) over the affected part 20 minutes twice daily, followed by heating compress (1344) during the interval; revulsive compress (1341); Scotch revulsive fan douche (1041).

16. **Motor Paralysis.**—Alternate douche (1044); massage douche (1066); cold percussion douche (1035).

17. **Hiccough.**—Hot trunk pack (1196); heating gastric compress (1344); sipping ice-cold carbonated water; lavage (1401).

18. **Syncope.**—Heat to neck (1382); short cold application to chest and face. Alternate compress to spine (1342); percussion of the chest with the hands dipped in cold water or with the end of a cold towel; vigorous centripetal friction (1223); rhythmic traction of the tongue.

19. **Spinal Irritation.**—Fomentation (1328) to the spine twice a day, followed by continuous heating compress (1344) during the intervals; Scotch fan douche (1061, 1037); fomentation (1328) followed by affusion (1103) for 5 minutes, 80° to 85°.

20. **Anal Spasm.**—Hot anal douche (1087) or hot, shallow sitz (1311) (102° to 106°). General applications of faradic, static, galvanic, or sinusoidal electrical currents are also useful in connection with massage, manual Swedish movements, and regulated gymnastics.

21. **Aphonia.**—Ice-bag to the throat (1314); with general cold douche (1037).

**General Method.**—Improve the patient's general health by vigorous tonic measures continued during many months or even years. Improve the general nutrition by a nutritious, simple, unstimulating dietary (1626). Combat special symptoms by the hydiatic measures indicated above, together with suitable mental and moral treatment.

### NEURASTHENIA.

This is not a distinct pathological entity, but a group of symptoms due to various etiological influences and connected with various morbid states. 1554

#### *Etiological Indications.*

1. Rest-cure for those who have been overworked nervously and physically, and for those who need a rapid gain of fat and blood; muscular exercise and diversion for those who are mentally and nervously tired.

#### *Pathological Indications.*

2. **Combat Autointoxication.**—Aseptic diet (1626); fruit diet (1627); daily neutral baths (1130) (1–3 hours); sweating procedures (642, 1233–1255) of short duration (3–6 minutes) followed by suitable cold applications (1625); hot enema (1406) daily; copious water drinking (1423); out-of-door life.

3. **Combat Exhaustion.**—Rest for the overworked. Improve digestion in cases of starved dyspeptics by appropriate measures. Foods rich in fats and proteids are especially important. Tonic cold applications carefully graduated (1625); especially percussion douche to spine.

4. **Check Exhausting Discharges** by appropriate measures as Menorrhagia (1588), Leucorrhea (1591, 3), Spermatorrhea (1596).

5. **Relieve Reflex Irritation.**—If sexual, rectal, prostatic, or urethral irritation, employ revulsive sitz (1311), prolonged neu-

tral sitz (1312), rectal and urethral irrigation, hot foot bath (1297), hot pelvic pack (1390). For ovarian irritation, in addition to above, hot vaginal irrigation (1413), 15 to 20 min.

6. **Irritation of Solar Plexus and Sympathetic Ganglia.**—Fomentation (1328) over abdomen three times daily; during intervals, heating compress (1344); abdominal supporter.

**Clinical Indications.**

7. **Improve General Nerve Tone.**—Graduated cold applications (1625). The cold percussion douche (1035) to spine is the most efficient of all measures; general cold douche (1010); very hot douche (1024) (110° for 30 seconds), followed by graduated or cold douche (1037).

8. **Indigestion.**—See 1520–1525.

9. **Constipation.**—See 1524.

10. **Intestinal Catarrh.**—See 1529.

11. **Headache.**—Hot and cold compress (1358); revulsive compress (1341); alternate spinal compress or sponging (1342); hot foot bath (1297); running foot bath (1296).

12. **Frontal Headache.**—Revulsive compress (1341) to forehead and eyes; hot and cold trunk pack (1367); derivative applications to feet and legs (682).

13. **Congestive Headache.**—Ice-bag (1314) to back of head and cold compress (1314) to face; ice-collar (1316); hot and cold cephalic compress (1358); hot foot bath (1297); hot leg pack (1393); heating compress to legs (1344); cold running foot bath (1296); alternate foot bath (1298); felt shoes.

14. **Occipital Headache.**—Hot compress (1286) or sponging (1206) to upper spine and occipital region. Revulsive compress (1341); hot and cold cephalic compress (1358).

15. **Nervous Headache.**—Fomentation (1328) to seat of pain, with simultaneous hot foot bath (1297); gastric lavage (1401). Daily cold enema (1405) to relieve constipation if present. Special attention to the diet; a dry aseptic (1626) diet is indicated, avoiding milk. See Migraine (1555).

16. **Sensation of Band around Head.**—Hot sponging (1206) or hot compress (1286); alternate sponging (1206) of neck and upper spine; massage to head.

17. **Sensation of Pressure at Vertex.**—Hot foot bath

(1297), cold compress (1314) to head; ice-collar (1316); sleep with head elevated; heat to feet and legs if cold.

18. **Pain in Eyes, Intolerance to Light or Use in Reading.**—Light fomentation over eyes and forehead (1264); protect eyes from bright light; facial massage and massage to eyes; an oculist should be consulted, as the temporary use of glasses to correct muscular insufficiency due to deficient innervation or some slight optical defect may be useful or necessary.

19. **Backache.**—Fomentation (1328) to abdomen; wet girdle (1347); abdominal supporter; alternate spinal sponging (1206) or compress (1340); Scotch douche (1037) to spine; revulsive sitz (1308).

20. **Neuralgia.**—See 1545.

21. **Insomnia.**—See 1564.

22. **Vertigo.**—Fomentation (1328) to stomach followed by wet girdle (1347). Gastric lavage (1401) when indicated. Bathing face or top of head with very hot water, or hot compress (1286) for 2 minutes, followed by cool compress (1318), 15 seconds; heat to back of neck in anemia of the brain (1262).

23. **Anorexia.**—Cold bag (1314) over stomach for half an hour before meals, with cold compress or water bag (1314) to epigastrium; cold mitten friction (1209) or cold towel rub (1213).

24. **Muscular Weakness, Especially in Legs.**—Cold percussion douche (1035) to spine; alternate douche (1044) to legs.

25. **Mental Depression.**—Sweating bath followed by short general cold douche (1010); neutral bath (1031) for 1 hour daily; neutral pack (1182); cold percussion spinal douche (1035); alternate spinal sponging (1342) or douche (1044).

26. **Fidgets.**—Fomentation (1328) to abdomen followed by wet girdle (1347); empty colon, if loaded, by enema (1404); abdominal supporter; revulsive sitz (1311); neutral pour to spine (1103).

27. **Dreams.**—Neutral bath (1031) for half an hour before going to bed; wet girdle (1347); evaporating head cap (1324); elevate head of bed; avoid eating after 4 P. M. except fruit.

28. **Flushings.**—Scotch fan douche (1061) to abdomen, especially the umbilical region; percussion douche (1035) to spine; alternate spinal douche (693, 1342); wet girdle (1347).

29. **Cold Extremities.**—Scotch douche (1037) to legs and feet, followed by standing shallow bath (1174); fomentation to abdomen (1328) twice daily, followed by heating compress (1344) during intervals; alternate foot bath (1298); massage to feet and legs; cold friction (1209).

30. **Perspiration when Sleeping.**—1508, II.

**General Method.**—While not recognizable as a distinct malady, it is convenient from a practical standpoint to consider neurasthenia as a disease. The tonic effects of cold water are essential in the treatment of neurasthenic conditions. The management of cold applications in such a way as to secure the tonic effects desired without aggravating any of the patient's symptoms is a problem which taxes to the utmost the skill and experience of the hydropathic physician. Special attention must be given to the digestion, improvement of nutrition, regulation of the bowels and the relief of prominent and distressing symptoms by suitable palliative measures.

### MIGRAINE.

#### 1555 *Etiological Indications.*

1. **Prevent Formation of Uric Acid.**—Avoid use of meats, also tea and coffee, etc.; aseptic dietary (1625); out-of-door life.

#### *Pathological Indications.*

2. **Eliminate Uric Acid.**—Hot baths, especially moderately prolonged sweating baths (1191) followed by short cold baths; electric-light bath (1250); wet-sheet pack (1179); vapor bath (1246); prolonged neutral bath (1130); water drinking (1423).

3. **Lower Arterial Tension.**—Hot immersion, 102°, 5 to 10 min. (1126); hot leg bath (1299); or pack (1393); hot enema, 100° to 204° (1406); rest in bed; exclusive of light.

#### *Clinical Indications.*

4. **Pain.**—Hot foot bath (1297); alternate spinal compress or sponging (1342); revulsive compress (1341) to seat of pain; local application of ice-bag (1314) in some cases: hot leg pack (1393); protect the eyes from light.

5. **Nausea and Vomiting.**—Lavage (1401); ice pills; ice (1314) to stomach and spine opposite.

6. **Constipation.**—Coloclyster (1407). See 1524.

**7. Gastric Disorders.—1519-1527.**

**8. To Prevent Attack.**—Lavage (1401); fruit diet (1627); large colocylyster (1407); water drinking (1423).

**9. To Relieve Hyperesthesia of Lumbar Ganglia.**—Abdominal fomentation (1328) twice daily; continuous heating compress (1344) during interval. Abdominal supporter.

**General Method.**—Every case is curable by sufficiently prolonged treatment, carefully managed. The general nervous system must be built up by measures essentially the same as those indicated for neurasthenia (1554, 3) and other conditions requiring tonic treatment. The causes must be removed, especially auto-intoxication and morbid reflex influences arising from dilatation of the stomach, enteroptosis, and indigestion.

**INFANTILE CONVULSIONS.**

***Etiological Indications.***

1556

1. Regulate diet, withholding meats and all indigestibles. Avoid cow's milk if curds are present in the stools. Daily cold bath, wet-hand rub (1201) or cold towel rub (1213).

***Pathological Indications.***

2. When due to autointoxication from intestinal irritation, large hot enema (1406). If undigested food is present in the stomach, lavage (1401). For immediate relief, hot-blanket pack (1197); warm bath (95° to 98°) (1123), 1 to 2 minutes. If not quickly relieved, remove from bath, and employ cold affusion (1103) to head and spine. Alternate hot and cold affusion if necessary. Apply wet girdle (1347), changing every 4 hours.

**WRITER'S CRAMP.**

1. **General.**—Scotch douche (1035, 1074) to spine and affected muscles twice daily. Neutral affusion (1103) to spine 10 minutes daily; neutral bath (1130), 1 hour at bedtime. Cold mitten friction (1209) twice daily following other treatment. Shallow bath 1 to 3 minutes (1174); prolonged neutral bath (1130); massage and passive exercises (1461).

2. **Paresis.**—Cold percussion douche to spine (1037, 1074) following warm rain douche (1047). Alternate douche (1044) to affected muscles. Gymnastics; passive exercises and massage of affected parts; sinusoidal or galvanic electricity.



## MELANCHOLIA

1558 *Pathological Indications.*

1. **For Anemia and Malnutrition.**—Fomentation (1328) to abdomen followed by cold mitten friction (1209) twice daily; aseptic diet (1626); water drinking (1423); air bath (1470); electric-light bath (1250); sun baths (1254); rest in bed; massage; manual Swedish movements; galvanization of cervical and abdominal sympathetic.

2. **For Cerebral Anemia** (usually present).—Warm compress (98° to 100°) to back of neck 15 minutes three times daily.

3. **To Diminish Blood Pressure** (usually excessive).—Warm immersion bath (1126), 98° to 100°, 10 to 20 minutes, twice daily; heating wet-sheet pack (1183); heating trunk pack (1196), 30 minutes, twice daily; neutral douche (94°), pressure 10 to 20 pounds, duration 2 to 4 minutes.

4. **For Autointoxication.**—See 1559, 4.

*Clinical Indications.*

5. **Insomnia.**—See 1564.

6. **Anorexia.**—Lavage; feeding with tube; see 1401.

7. **Constipation.**—Laxative diet, fruit, granose, malted cereals (1631); cool enema. See 1524.

8. **Indigestion.**—See 1521, 1522.

9. **Cold Extremities.**—See 1554, 29; 1527, 6.

10. **Dry Skin.**—See 1609.

11. **Mental and Nervous Irritability.**—Neutral bath (94° to 96°, 30 minutes to 2 hours); heating wet-sheet pack (1183); wet girdle (1347); heating spinal compress (1344, 1355).

12. **Contraindications.**—Avoid cold immersions and all very cold general applications, which by raising blood pressure and exciting the irritable cerebral structures aggravate the condition.

**General Method.**—A patient suffering from melancholia requires essentially the same therapeutic measures as the neurasthenic with the special moral treatment and control indicated.

## MANIA.

1559 *Pathological Indications.*

1. **For Malnutrition.**—Graduated tonic baths (1625); generous aseptic diet. See 1558, 1.

2. **To Increase Blood Pressure.**— Hot baths — electric-light (1250), hot immersion (1126), 100° to 102°, 8 to 15 minutes, hot leg (1299) or sitz bath (1311), 108° to 115°, 8 to 12 minutes, followed by shallow (1174) at 68° to 74°, affusion (1103) at 70° to 60°, or percussion douche at 60° to 50°, duration 20 to 40 seconds; ice-bag over heart for 15 minutes every 2 hours.

3. **To Diminish Cerebral Hyperemia.**— Short hot immersion (1126) or shower (1047) followed by douche (1010) at 70° to 60°, 20 to 40 seconds, light pressure; hot (106° to 115°) leg (1299) or sitz bath (1311); ice-collar (p. 779); cephalic compress (1371); wet girdle, well protected (1347); heating wet-sheet pack (1183).

4. **For Autointoxication.**— Aseptic diet (1626), if necessary, fruit (1627) or kumyss diet (1628); colocylyster (1407) daily for a few days; long neutral bath (1130), 30 to 60 minutes.

#### **Clinical Indications.**

5. **To Relieve or Prevent Exhaustion.**— Rest in bed; tonic treatment (1625) twice a day.

6. **For Fever.**— Local antiphlogistic measures (698) as may be indicated; neutral bath (1130); cooling pack (1189).

7. **For Insomnia.**— See 1564.

8. **For Constipation.**— Cool enema (1409). See 1524.

9. **Indigestion.**— See 1521, 1522.

10. **Contraindications.**— Avoid very hot or prolonged cold baths; avoid cold to head when face is pale.

#### **CONFUSIONAL, PUERPERAL; POST-FEBRILE, POST-OPERATIVE, TOXIC INSANITIES.**

1. **Malnutrition.**— Rest; careful tonic treatment (1625). 1560

2. **Autointoxication.**— Aseptic dietary (1626); fruit diet (1627) for 3 or 4 days; warm baths, electric-light (1250), sweating pack (1191) followed by short cold applications; wet-sheet rub (1216) or douche (1010); copious water drinking (1423); colocylyster daily (1407) for a week or two.

3. **Puerperal Lesions or Complications.**— Curettement, hot vaginal irrigation (1413); neutral (1312) or tonic sitz (1309).

4. **Fever.**— Absolute rest in bed; prolonged tepid bath (88° to 92°, 30 to 60 minutes); cooling enemas (1405); cold cephalic compress (1371); copious water drinking (1423).

5. **Alcoholism.**—Withdraw alcohol at once; withhold food for 3 days; nutritive enemas; copious water drinking (1423); neutral colocyler (1407) daily for a week.

6. **Uremia.**—See Acute Nephritis, 1537.

7. For other Clinical indications, see Simple Mania above.

8. **Contraindications.**—The same as those of Mania, when conditions coincide. Especially avoid all intensely exciting procedures.

**General Method.**—In most cases essentially the same as for Mania, giving special attention to the particular etiological element which may be a prominent factor in the case. In certain cases, the symptoms are those of Melancholia, and the treatment must be modified accordingly.

#### GENERAL PARESIS.

##### 1561 *Pathological Indications.*

1. **Malnutrition.**—Vigorous but graduated tonic measures (1625); rest in bed. See 1558, 1, also Neurasthenia, 1554.

2. **Cerebral Hyperemia.**—Continuous ice-cap (1323). See 1562, 1.

3. **Disturbed Arterial Tension.**—If excessive, see 1558, 3; if diminished, see 1559, 2.

4. **Autointoxication.**—See 1559, 4.

##### *Clinical Indications.*

5. **Insomnia.**—Ice-cap (1323); neutral bath (1130) or douche (1031); wet girdle (1347); wet-sheet pack (1179). See 1564.

6. **Constipation.**—Cool enema (70°); wet girdle (1347); cold abdominal douche (1081); abdominal massage. See 1524.

7. **Retention of Urine.**—Catheterization; irrigation of the bladder (1411); cool rubbing sitz (1309), 70° to 65°, 3 to 6 minutes; cold spray to feet (1055); cold plantar douche (1083); cold hypogastric douche (1080) (75° to 60°); running foot bath (1296).

#### HEADACHE.

1562 The following grouping of headaches is made for practical convenience alone, and is not offered as a scientific classification:—

1. **Hyperemic Headache.**— Rest, head and shoulders elevated; heat to feet and legs — foot bath (1297), leg bath (1299), leg pack (1393), Scotch douche (1037); cold to head and neck (1314), enema at 102° (1406); well protected wet girdle night and day (1347); wet sheet pack (1179); neutral spray, 2 to 4 minutes (1057), moderate pressure.

2. **Anemic Headache.**— Hot bag to back of neck; fomentation (1328) over painful part; rest in bed with head low; general treatment for anemia. See 1580.

3. **High Pressure Headache.**— Abstemious aseptic diet; prolonged warm or neutral bath daily, with cool compress to head; hot leg (1299) and foot baths (1297); Scotch douche (1037) to legs; heating compress (1344) over heart.

4. **Dyspeptic Headache.**— Gastric lavage (1401) if stomach is foul; enema (1405) if constipated; dry, aseptic diet (1626) two meals a day, or fruit only at night.

See 1119 to 1523. For palliation, hot and cold cephalic compress (1358); avoid sleeping soon after eating, though a short nap is sometimes beneficial.

5. **Headache Due to Enteroptosis.**— Abdominal supporter; wet girdle at night (1347); abdominal massage; cold abdominal douche (1081); sinusoidal current to muscles; galvanization of cervical and abdominal sympathetic; for palliation, alternate spinal sponging (1342) or compress (1340); hot and cold head compress (1358).

6. **Toxic Headache.**— Due to uric acid, oxalates, urea, and other wastes, or to decomposition products absorbed from the alimentary canal. Sweating baths (1125, 1197, 1246, 1126) followed by cold douche (1010), wet-sheet rub (1216), or shallow (1174); copious water drinking (1423); enema (1405) or coloclyster (1407) daily or tri-weekly; out-of-door life; air-bath (1471); aseptic diet.

7. **Periodical Headache, Nervous Headache, Bilious Headache, Migraine, Heremicrania.**— Dry, abstemious, aseptic diet (1626); out-of-door life; air-bath (1470); gastric lavage and large enema (1401) the day before attack is due (1406); tonic treatment (1625); wet girdle (1347); abdominal supporter if enteroptosis exists.

8. **Rheumatic Headache.**— Sweating bath, 1499, 12, daily;

hot foot bath (1297) or leg pack (1393), fomentation to painful part for 10 to 15 minutes, followed by heating compress (1344). See Uric Acid Diathesis 1511.

9. **Neurasthenic Headaches.**—See 1554, 11-15.

10. **Clavus.**—Very hot foot bath (1297), with fomentation over painful point for 10 minutes, repeated every 2 hours; carefully graduated cool baths (1625). Heating compress at night; protect well from cold during the day.

11. **Renal Headache.**—Copious water drinking (1423); enema (1405); hot bath (1126, 1250, 1246, 1197); ice-bag over lower sternum, with hot and cold compress to head (1358).<sup>38</sup> See Acute Nephritis (1537); and Chronic Nephritis (1538).

12. **Hepatic Headache.**—Aseptic diet (1626); fruit diet (1627); water-drinking (1423); graduated enema (1409); fomentation over liver twice daily, 15 min., heating compress during the intervals. Out-of-door exercise; air-bath (1470); breathing exercises; abdominal massage. For palliation, revulsive compress to head (1341); hot and cold head compress (1358), with derivative applications to legs (1299, 1393, 1037, 1250); graduated tonic treatment (1625).

13. **Organic Headaches** (tumors, inflammation, syphilis, abscess, trauma, general paresis).—Very hot and frequently repeated derivative applications to legs, with short, often repeated revulsive compress to head, followed by cold or heating compress.

14. **Headache Due to Disease of Eye, Ear, Nose, and Teeth.**—Correct diseased condition by surgical or other means. Hot foot (1297), or leg (1299) bath, with revulsive compress (1341) over painful parts.

15. **Coldness, Numbness, Pressure, Band Sensation, Etc.**—Improve vasomotor tone by tonic measures (1625); massage of head and neck; revulsive compress (1341) to spine, head, and face; hot and cold head compress (1358); static breeze. See Neurasthenia 1554.

**Supra-orbital Headache.**—Hot foot bath with revulsive compress above the eye-brow, but not covering the eye; avoid exposure to cold; rest eyes, protecting from light; general tonic treatment (1625). Hot foot (1297) or leg pack (1393).

16. **Temporal Headache.**—Fomentation (1328) over side of head, face and ear, for ten minutes, followed by warm dry com-

press, repeated every two hours, between attacks, tonic treatment (1625), local massage, galvanism, sinuosoidal current. Fat- and blood-making diet (1626). See Lithemia (1511).

17. **Mastoid or Post-Auricular Headache.**—Fomentation for 10 minutes to side of head followed by cotton poultice or well-covered heating compress. Otherwise the same as 16, above. See also 4 and 14.

18. **Cervico-Occipital Headache.**—Revulsive compress to back of head and neck. Otherwise the same as 16, above. See Neurasthenia 1554.

19. **Uterine Headache** (Pain or pressure at vertex).—Revulsive sitz (p. 766, 770); abdominal supporter; wet girdle (1347); application of sinusoidal electricity to uterus; central galvanization; hot and cold head compress (1358); massage of head; static breeze to head. Correct any ovarian or uterine disease present. See neurasthenia 1554.

20. **Fever Headache.**—Ice-cap or cold cephalic compress (1371); ice-collar (1316); ice-bag over heart (1314); cooling pack (1189); prolonged neutral bath.

#### THERMIC FEVER, HEAT STROKE, SUN STROKE, HEAT EXHAUSTION.

1. **Thermic Fever.**—Increase heat elimination. Pour from a 1563 height water at 60° or less, while two persons rub the patient vigorously. Give special attention to the spine. Ice compress to the head and neck (1318). Continue until the temperature falls to 101°; cool enema (1405); cold water drinking (1426) when possible. Ice-bag to the head and neck (1314) during cold affusion (1103). As soon as the temperature falls to near the normal point, sweating wet-sheet pack (1183, 1191).

2. **After-Treatment** should consist of daily graduated cold applications (1625). The head should be thoroughly cooled before each application.

3. **Neurasthenia.**—See 1554.

4. **Insomnia.**—See 1564.

5. **Heat Exhaustion.**—Hot immersion bath (1126), 3 to 8 minutes; hot-blanket pack (1197); hot enema (1406) followed immediately by short cold mitten friction (1209), cold wet-sheet rub (1216), afterward wrapping in warm blankets.

6. **Threatened Cardiac Failure.**—Cold bag over heart (1383) for 15 minutes every hour; cold mitten friction (1209) every 2 hours; hot-blanket pack (1197) 10 minutes, followed by cold towel rub (1213). Hot enema (1406) followed by cold enema (1405); artificial respiration.

### INSOMNIA.

#### 1564 *Pathological Indications.*

1. **To Relieve Cerebral Congestion.**—Neutral douche (1031) 3 to 5 minutes at bedtime; cold douche (1010); hot leg bath (1299); running foot bath (1296); heating wet sheet pack (1183) followed by rubbing wet sheet (1216); wet girdle warmly covered and protected with mackintosh (1347); heating leg pack (1393); dry heat to the feet and legs; hot leg pack (1393) followed by cold mitten friction (1209) to the legs; heating compress to legs, or leg pack at bedtime, to be prolonged during the night; wet-girdle and leg pack over night; Scotch douche (1037) to the legs at 102°, 2 minutes, 60° 15 seconds; neutral douche (1031), 3 to 5 minutes; evaporating head-cap (1324); downward stroking of head and neck; galvanization of the cervical sympathetic.

2. **Relieve Irritability of the Cerebral Cell.**—Prolonged neutral bath (1130) at bedtime; neutral wet-sheet pack (1182). Enema (1404) if constipation or flatulence are present.

3. **Irritability of Solar Plexus or Lumbar Ganglia.**—Abdominal fomentation (1328) followed by abdominal heating compress (1351), changing every 6 hours. Avoid eating anything but fruits after 4 P. M. Copious water drinking (1423). Coloclyster (1407), especially if the bowels are inactive, as constipation is a frequent cause of insomnia through producing irritation of the abdominal sympathetic.

4. **Excessive Cardiac Activity.**—Ice-bag over heart (1383). Galvanism to spine and cervical sympathetic.

5. **Fidgets, or Restlessness.**—Warm affusion to spine (1103), 95° to 98°. Tepid sponging (1204); rubbing of limbs; rubbing spine (1221); massage of head.

6. **General Irritability.**—Neutral wet-sheet pack (1182); neutral immersion bath (1130); neutral fan douche (1031) or shower (1047) 2 to 4 minutes.

**General Method.**—There may be said to be three forms of insomnia: Sleeplessness may be due to (a) congestion of the brain; (b) irritability of the cerebral cell, or to (c) a combination of these two conditions. Which of these conditions is present in any individual case must be carefully determined, and the treatment adjusted accordingly, as above indicated.

### PRURITIS.

1. Neutral fan douche (1061), 95° to 100°, 10 to 15 minutes. 1565  
Drying by gently patting over Turkish sheet or towel. Prolonged neutral bath (1130) 94° to 96°. If temperature sense is perverted, employ higher or lower temperature.
2. **Winter Pruritis of Lithemia.**—Very hot Scotch douche, (1037), 1 to 2 minutes, 115° to 122°, followed by cool douche 70° 30 seconds; prolonged neutral bath (1130), 92°.
3. **Pruritis of Genitals or Anus.**—Prolonged cold compress (1318) or ascending douche (1058, 1087) when no eruption is present; with eruption, very hot spray followed by evaporating compress and a suitable lotion or unguent. If the skin is thickened, very hot or alternate douche (1044) or revulsive douche (1041) to affected parts, with considerable pressure, three times a day.

### NASAL CATARRH.

#### A. Acute Catarrh—Acute Coryza.

1. Sweating bath at bedtime (1216, 1126, 1191, 1250) 1566  
followed by a short cold application,—wet-sheet rub (1216), cold towel rub (1213), cold douche (1010); hot foot bath (1297) with very hot compress to face (1286); steam inhalation (1419); water drinking (1423).
2. **To Prevent.**—Cold bath daily, or twice a day (1625); out-of-door life; avoid excessively warm clothing and warm living or sleeping rooms in winter. Wear linen next the skin summer and winter.

#### B. Chronic Catarrh.

##### **Etiological Indications.**

3. Avoid taking cold, and when an acute catarrh is contracted, cure as soon as possible. See Acute Catarrh 1566, 1, 2.



**Pathological Indications.**

**4. Increase Activity of the Skin and Tone of Cutaneous Vessels.**—Short sweating procedures, especially the electric-light bath (1250) and wet-sheet pack (1179) continued until the sweating stage, followed by short cold applications,—wet-sheet rub (1216), shallow (1174), or cold douche (1010); neutral bath at bedtime (1130), 20 to 30 minutes, 3 times a week; daily cold morning bath; cold towel rub (1213); cold shower (1047) or rubbing shallow (1174). All sweating baths ought, if possible, to be taken just before retiring at night. During cold weather, oil rubbing (1232) two or three times a week.

**5. Improve General Nutrition by Correcting Existing Digestive Disorders.**—See 1520, 1521, 1523. Out-of-door exercise, especially sun-baths (1254) and swimming.

**6. Relieve Nasal Congestion.**—Alternate compresses to the face (1340); alternate sponging or compresses to the cervical spine (1342); running cold foot (1296) bath if extremities are cold; nasal secretions must be removed by antiseptic spray or vaporizer; hypertrophies, polypi, etc., require surgical interference.

**General Method.**—Build up the general health by tonic measures, employing tonic cold procedures (1625) of some sort at least twice daily. Avoid hot baths and too warm clothing and expose the body as much as possible to the open air. Use great care to avoid taking cold by undue exposures; but gradually train the body to the point of enduring exposure without injury. The intestinal disease, which is simply a local manifestation of a general condition of lowered vital resistance, must have the benefit of such local measures as are indicated above.

**PHARYNGITIS — TONSILITIS.****A. Acute Form.**

**1567** 1. Rest in bed, room of uniform temperature. Spare diet consisting chiefly of fruits (1626, 1627). Avoid meats of all sorts. Copious water drinking (1423), especially carbonated water.

2. Hot-blanket pack (1197); sweating wet-sheet pack (1183); vapor bath (1246); electric-light bath (1250); hot immersion bath (1126) followed by dry pack (1192, 1191) or other sweating procedure once daily, followed by cold mitten friction (1209), cold wet-sheet rub (1216), or cold douche (1010). Fomen-

tation (1328) to the throat three times a day; cold compress (1381) between, changed every 15 to 30 minutes. Enema (1404) if bowels are inactive. Hot gargle (1400) every few minutes if throat is very sensitive. Ice-bag to throat if inflammation is intense. Inhalation of antiseptic vapors; use of steam inhaler (1419), 10 to 14 minutes hourly, or almost continuously. If tonsil suppurates, it should be lanced.

**B. Chronic Pharyngitis or Tonsillitis, Clergyman's  
Sore Throat.**

1. Aseptic dietary (1626); out-of-door life; open air gymnastics; swimming.
2. Fomentation to throat at bedtime (1328), followed by throat pack (1381) during night; hot gargle (1400) three times a day.
3. Electric-light bath (1250); sweating pack (1191); vapor bath (1246), or other sweating bath, three times a week, followed by suitable cold application (1625). Daily cold bath on rising. Moist girdle (1347) to be worn during the night. If necessary remove tonsils and vegetations in throat or post-nasal region.

**LARYNGITIS.**

**A. Acute Form.**

See Acute Coryza (1565). Steam inhalation (1419), for 1568 10 minutes hourly; heating compress to throat (1382) without mackintosh; avoid use of voice while very hoarse.

**B. Chronic Form.**

1. **Increase General Vital Resistance, and Invigorate the Skin.**—Graduated cold baths (1625); sweating bath (1197, 1246, 1250) or prolonged neutral bath (1130) at night, two or three times a week. Follow sweating procedure by any suitable cold application.
2. **To Relieve Local Congestion.**—Steam inhalation (1419) every 4 hours for 10 minutes; fomentation (1328) at night, followed by well-protected neck compress (1382) to be worn during the night.
3. **Cough.**—See 1569, 4-7.

**CROUP.**

1569

**A. Acute Catarrh of Larynx.**

Hot bath with cold to head; hot water drinking (1429); cold mitten friction (1209) every 3 hours; inhalation of vapor arising from slacking lime; cold compress, 60°, over throat, changed every 10 to 20 minutes; hot-blanket pack every three or four hours, 15 minutes; keep feet, legs, and arms very warm. Surgical interference often necessary.

**B. False Croup, Laryngismus Stridulus, Spasmodic Laryngitis.*****Etiological Indications.***

1. **Prevent attacks** by hardening the skin by daily cold bath (1625). Remove nasal obstruction, hypertrophies, or adenoid vegetations. Antiseptic inhalations.
2. **Prevent Chilling of Shoulders** during sleep, by warm sleeping jacket. Proper clothing.

***Pathological Indications.***

3. **Develop Resistance.** — Graduated tonic applications (1625); out-of-door life; careful regulation of clothing.
4. **Relieve Congestion** if spasm is severe by hot-blanket pack (1197) or hot immersion bath (1126). Repeat every three to six hours. Hot half-bath (1174) with cold affusion (1103) to head, back, and chest. Follow bath by ice-cold heating compress to neck (1382) to be changed every two to four hours. Fomentation to cervical and dorsal spine for 15 minutes each time the ice compress is changed.
5. **To relieve spasm**, compress the phrenic nerve by pressure just above the sternal intersection of the sterno-cleido-mastoid muscle; percuss chest with end of cold wet towel, or dash cold water over chest and back.
6. **Bronchitis.** — If present, chest pack (1373); repeat in four to six hours; cold mitten friction (1209) twice a day. Steam inhalation (1419) and copious water drinking (1423) when bronchial or laryngeal catarrh exists.

## ACUTE BRONCHITIS.

**Etiological Indications.**

1570

1. **Increase Resistance.**— Graduated cold applications (1625) daily; out-of-door life; daily air bath (1470); avoid excessively warm clothing, and very warm sleeping or living rooms.

**Pathological Indications.**

2. **Eliminate Toxins.**— Moderately prolonged sweating procedures (1250, 1246, 1233, 1191) followed by cold applications.

3. **Relieve Visceral Congestion.**— Electric-light bath (10 to 20 minutes) (1250), sweating pack (1191), 1 to 2 hours, or vapor bath (1246) 6 to 15 minutes, followed by rubbing wet sheet (1216) or cold douche (1010); hot bath at bedtime (1126) for 6 to 10 minutes, followed by prolonged neutral bath (1130) 20 to 40 minutes. Apply daily or twice a day, hot hip (1389) and leg pack (1393), followed by cold towel rub (1213).

**Clinical Indications.**

4. **Cough.**— Chest pack (1373), to be changed every 6 hours. If temperature is elevated, change chest pack every 2 to 4 hours. Copious water drinking (1423), 2 to 3 pints daily.

5. **Irritable Cough, without Expectoration.**— Sipping very hot water; gargle hot water (1400); steam inhalations (1419); avoid mouth breathing; keep air of room warm (75° to 80°), and moist with steam; carefully avoid exposure of back of neck, chest, or shoulders to drafts, or chill by evaporation during treatment.

6. **Cough with Viscid Expectoration.**— Copious hot water drinking (1423); fluid diet (1628); fomentation to chest (1328, 1380) every two hours, followed by heating compress (1373).

7. **Painful Cough.**— Fomentation to chest (1328) every two hours; tight bandage about chest to restrain movement if necessary; revulsive compress (1341) for 15 minutes every two hours or often as needed, dry cotton chest pack (1388) between applications. 1571

## CHRONIC BRONCHITIS.

1. **Improve General Resistance.**— Graduated cold treatment (1625); aseptic dietary (1626); warm dry climate; outdoor life.

2. **Cough.**—Chest pack (1373) protected by impervious covering. Copious water drinking (1423), 3 to 6 pints daily, steam inhalation (1419). See 1570.

3. **Ineffective Cough.**—Increase expulsive power by rubbing or percussion of the chest with the hand dipped in ice water, or slapping the chest with a cold, wet towel.

4. **Asthma.**—Cold fan douche to back of chest (1061), followed by heating chest pack (1373); revulsive compress to chest (1341); Scotch douche to legs (1037); hot foot (1297) or leg bath (1299); hot leg pack (1393); hot enema (1404); if sympathetic is irritable, wet-girdle (1347, 1348, 1367); chest pack (1373), well protected.

5. **Emphysema.**—Alternate compress or douche to spine (1342); cold mitten friction (1209); cold towel rub (1213); wet-sheet rub (1216); wet girdle covered with flannel only (1347); leg packs (1393); cold precordial compress (1383) 15 to 30 minutes three times a day.

**General Method.**—The general method is the same as that for intestinal catarrh. See 1529.

#### PULMONARY CONGESTION.

1572 1. **Active Congestion.**—Fomentation to back (1328), cold compress to chest (1318) with hot leg pack (1393), followed by cold friction and dry heat (1192) to legs; short cold applications to hands and arms (1209, 1213), followed by hot packs to arms (1328); Scotch douche to legs (1037); hot leg bath (1299) with very cold compress to chest (1314) before and behind. Change compress as soon as warmed.

2. **Passive Congestion of Chest.**—Apply fomentation (1328) over chest for 10 minutes every hour; during interval, cold compress (1314), renewing every fifteen minutes, rubbing surface well at each change. Most often occurs in fevers (hypostatic congestion). Prevent by frequent change of patient's position. Apply same derivative measures as for active congestion (See above).

3. **Pulmonary Hemorrhage.**—Ice compress to chest (1314); remove, and rub the chest with dry warm flannel 1 to 2 minutes every 15 minutes; hot leg pack (1393), very hot sponging of the upper half of the spine. Place hands in ice-water 1 to 2 minutes; maintain skin circulation by dry rubbing (1221). Keep

patient very quiet. After hemorrhage ceases, graduated cold treatment (1625) to increase resistance and combat the disease to which the hemorrhage is due. See Pulmonary Tuberculosis 1508.

#### BRONCHO-PNEUMONIA.

For general measures See Lobar Pneumonia (1498).

1573

1. **Bronchial Irritation.**—Steam inhalation (1419), 15 minutes every hour; fomentation (1328) to chest every 2 hours for 15 minutes, followed by heating compress (1373); hot-blanket pack.

2. **Cyanosis.**—Short hot half-bath (1174); pour cold water over head, spine, and chest to induce cough, if cough is checked or inefficient while secretion is abundant. It is well to have the patient sit in a tub with a small amount of hot water (1174), while a cold affusion (1102) is administered followed by vigorous rubbing, and wrapping in dry blankets in bed.

3. **Heart Failure.**—Cold precordial compress (1383) 15 minutes every hour. Also see 1578, 1, 5.

4. **After Convalescence Begins.**—Chest pack (1373) night and day. Graduated cold applications (1625) to build up general resistance.

#### PLEURISY.

##### A. Acute Form.

1. **General.**—Improve general resistance by cold applications two or three times daily (1625, 1201, 1209, 1213); hot leg bath (1299) if extremities are cold. Water drinking (1423); aseptic dietary (1626). 1574

2. **Pain.**—Very hot fomentation (1328) for 10 minutes over affected side. Revulsive compress (1341); limit movement of lung by tight bandage to the chest. Repeat every 2 hours. During interval, apply either cold (1318) or heating compress (1344) as best suits the case.

**After Convalescence.**—Alternate chest douche (1044) or alternate compress (1340) if necessary to absorb exudate. Apply three times a day, continuous heating compress (1344, 1373), with mackintosh covering, during interval.

3. **Exudate.**—Alternate compress or spray three times a day; graduated general tonic applications (1625). Prolonged neutral bath (1130) half an hour to an hour daily.

**B. Chronic Form.**

1. Neutral bath (1130) at night three times a week, of 20 to 30 minutes' duration. Graduated cold (1625) daily. Fomentation (1328) to chest three times a day, or revulsive spray (1041), or compress (1341); well-protected heating compress (1344) during the interval.

2. Aseptic dietary (1626). Gymnastics to expand chest after removal of fluid if necessary to overcome adhesions.

3. **Tubercular Pleurisy.**—Short revulsive compress (1341) (5 minutes) for relief of pain, three or four times a day, or often as necessary; flannel-covered heating compress (1344) during intervals; graduated tonic measures (1625).

**NOCTURNAL ASTHMA.**

1575 Neutral bath (1130) at bedtime; wet girdle (1347); copious water drinking (1423); enema before retiring (1404); graduated cold baths (1625); renal douche (1098). Cold colocyler (1407) daily in cases of toxemia with dilated colon. Correct any existing gastric disturbance.

Sweating process when skin is inactive (1250, 1246, 1197, 1191) followed by cold bath of appropriate form (1625).

**PERICARDITIS, ENDOCARDITIS.**

1576 1. **To Combat Inflammation.**—Continuous ice-bag (1383) over heart, or precordial compress at 60°, changed every 15 minutes. Remove ice-bag every 15 minutes, rub chest with dry flannel until skin is red.

2. **To Energize Heart and Maintain General Vital Resistance.**—Cold mitten friction (1209); cold towel rub (1213) twice a day.

3. **Fever.**—Prolonged neutral bath (1130); neutral wet-sheet pack (1182).

4. **Pain.**—Fomentation (1328) for 1 to 3 minutes every half-hour; cold compress changed every 15 minutes during interval.

5. **Myocarditis.**—Employ all the means above recommended, except, avoid ice-bag over heart.

### ORGANIC CARDIAC DISEASE, VALVULAR DISEASE OF THE HEART.

1. General tonic measures, carefully graduated (1625); moderate antiseptic dietary (1626), avoiding hot foods, tea and coffee, alcoholic drinks, condiments, flesh meats, and indigestibles. 1577

**Pathological Indications.**

2. **To Increase Energy of Heart.**—Ice-bag over heart (1383) for 15 minutes, gradually increased to 1 hour, twice a day. If limbs are swollen, rest in bed until swelling disappears. Effervescent bath (1139) one to three times weekly; massage; leg packs. Special gymnastics (Schott).

**Clinical Indications.**

3. **Dyspnea.**—Elevate the head and shoulders when patient is lying down; cold compress to chest (1318) and hot pack to legs (1393); change compress every 15 to 20 minutes; at each change, rub the surface of the chest with dry flannel until red.

4. **Pain.**—Very hot fomentation (1328) over seat of pain for 3 minutes; follow by heating compress (1344) at 60°, changing every 20 minutes; repeat every two or three hours; revulsive compress (1341); hot and cold gastric compress (1356).

5. **Insomnia.**—Elevation of head and shoulders or head of bed; wet girdle (1347); neutral bath (1130) for half an hour at bedtime, or neutral douche (1031) 3 to 4 minutes at bedtime.

6. **Headache.**—Prolonged neutral bath (1130); copious water drinking (1423); cool enema (1404); hot-blanket pack (1197) with ice-bag over the heart (1383); ice-cap (1323, 1371). If kidneys are diseased, apply fomentation over loins with ice-bag over heart and lower third of sternum.

7. **Dropsy.**—Rest in bed; hot blanket pack (1197) followed by sweating wet-sheet pack (1191) ending with cold friction (1209); leg packs (1393); electric-light bath (1250) or vapor bath (1246) for lower half of body; ice-bag over heart during hot baths; massage; effervescing bath (1139).

8. **To Energize the Heart and Encourage Peripheral Circulation.**—Wet sheet rub (1216); cold towel rub (1213); Scotch douche (1037) at 102°, lowering without sudden change to 80° during first applications. At each succeeding application, a temperature 1° lower until 65° or 60° is reached. Cold friction



(1209); fan douche (1061) over chest without pressure at 75°, duration 10 or 15 seconds.

9. **Cardiac Hypertrophy.**—Rest in bed; ice-bag over heart for 1 hour three to four times daily; prolonged neutral bath (1130), 92° to 94°, 20 to 60 minutes; neutral pack (1182) 20 to 40 minutes; graduated cold baths (1625); heating abdominal compress (1351); gentle massage; centrifugal friction (1224).

10. **Hepatic Congestion and Hypertrophy (Nutmeg Liver).**—Alternate compress (1340); alternate douche (1044) with slight pressure; heating compress (1344), covered with flannel only during the night; if pain is present, revulsive compress (1341); treatment for relief of portal congestion. See 1278, 1279.

11. **Pulmonary Hemorrhage.**—See Pulmonary Congestion (1572, 2, 3).

12. **Cough.**—If acute, 1572, 2; if chronic, chest pack, flannel covered (1373); warm covering of arms; heat to legs; intermittent precordial compress (1383).

13. **Palpitation.**—See 1578, 3.

14. **Angina Pectoris.**—Ice-bag to dorsal spine (1372); hot leg pack (1393); short fomentation (30 secs.) over heart, followed by warm dry compress.

15. **Gastric Catarrh.**—See 1520.

16. **Arterio-Sclerosis.**—Prolonged neutral bath (1130) three times a week at bedtime. Carefully graduated cold baths (1625). Aseptic dietary (1626); gentle massage; moderate exercise.

17. **Contraindications.**—Cold immersion baths, cold douche, Russian bath, very hot or prolonged warm baths. Avoid such exercises as produce swelling of feet, cough, dyspnea. Ice-bag over the heart, and the ice-cold precordial compress must be avoided in cases of fatty heart.

In general, cases of valvular disease of the heart require, during the *first stage*, carefully graduated cold baths with moderate exercise. During the *second stage*, rest in bed, ice-bag over the heart for 15 to 30 minutes two to three times daily; very carefully administered tonic treatment, such as cold mitten friction, cold towel rubbing, graduated into more vigorous measures (1625); skillful massage and carefully graduated exercises. In the *third stage* complete rest in bed, with the application of special measures for the relief of dropsy (1582), and the careful em-

ployment of the same measures necessary for the second stage. The general aim is to energize the heart and lessen its work by increasing the activity of the peripheral heart (1139).

### FUNCTIONAL CARDIAC DISEASES.

1. **Shock, Collapse, Cyanosis.**— Hot fomentations (1328) or hot-blanket pack (1197) for 10 to 15 minutes, or hot immersion bath (1126) 3 to 6 minutes, followed by cold mitten friction (1209); cold towel rubbing (1213) or wet-sheet rubbing (1216), continued until surface is reddened, applying every 2 to 3 hours, or two to three times daily, as may be necessary; ice-bag over heart, or cold precordial compress (1383), 15 minutes, repeating every hour; alternate compress to spine (1342); hot enema (1406); keep patient warm by hot bags and flannel blankets; alternate compress (1340) over heart if necessary; heat to head if face is pale. 1578
2. **Tachycardia.**— Rest in bed; ice-bag over heart (1383); gastric lavage (1401) if indicated; cold enema (1404) or colocolyter (1407) to relieve constipation; if abdominal ganglia are sensitive, abdominal fomentation (1328) followed by heating compress (1344) to be repeated every 6 hours; neutral bath (1130) for half an hour, 92° to 94°; gastric lavage if stomach is foul.
3. **Cardiac Palpitation.**— Rest in bed; cold precordial compress (1383); ice-bag to the cervical region (1314); cold frictions (1209); cold douche (1047) following hot foot bath (1297); wet-sheet rub (1216); shallow bath 78°, one-half minute (1174); gradually accustom patient to cold applications (1625); hot and cold gastric compress (1362), or trunk pack (1367); gastric lavage (1401); enema (1404).
4. **Aortic Palpitation.**— Usually due to toxins or other irritants of the abdominal sympathetic. Fomentation (1328) to abdominal region for 10 minutes followed by heating compress (1351) to be renewed every 4 to 6 hours; if enteroptosis is present, abdominal supporter; ice-bag over abrt. Relieve constipation if present by cool enema (1404), 75° to 65°. Gastric lavage if required. Wet girdle (1347) at night without impervious covering.
5. **Feeble Heart, without Fatty Degeneration.**— Cold precordial compress (1383) 15 minutes daily; increase 5 minutes each day until duration is 30 to 40 minutes. Percussion douche

to the spine (1035); vigorous cold friction (1209) to extremities. Avoid prolonged cold applications or prolonged chilling.

6. **Decrease Work Required of the Heart.**— Dilate surface vessels and increase their activity by cold mitten friction (1209), cold towel rub (1213), wet-sheet rub (1216), shallow bath, 72° to 75°, one-half minute (1174). If necessary, precede the short cold application by a short heating procedure as a fomentation to the spine (1328), vapor (1246), hot immersion (1126), or electric-light bath (1250) for 3 to 5 minutes, or hot sponging (1206).

7. **Remove Toxins.**— Lavage (1401); colocolyster (1407); water drinking (1423).

8. **Slow Pulse.**— Alternate sponging or compress to spine (1342); hot water drinking (1429); dry friction (1221); massage; carefully graduated cold baths (1625).

9. Avoid hot baths, or if a warm bath is necessary, make very short (102° to 104°), and follow with short, cold application.

### CHLOROSIS.

#### 1579 *Etiological Indications.*

1. **Correct Enteroptosis.**— Abdominal Supporter; abdominal massage; corrective exercises; cold abdominal douche (1081); electricity.

#### *Pathological Indications.*

2. **Increase Vital Resistance.**— General graduated cold procedures (1625) twice daily.

3. **Combat Autoxintication.**— Aseptic diet (1626); sweating bath to beginning perspiration, electric-light bath (1250) or sun bath (1254) followed by short cold application (1625).

#### *Clinical Indications.*

4. **Low Blood Count.**— See Anemia 1580, 1.

5. **Constipation.**— See 1524.

6. **Vaso-Motor Spasm.**— General Scotch douche (1037); alternate immersion (105° to 110°, 30 seconds, 80° to 70°, 15 seconds); simultaneous Scotch douche (1037).

7. **Visceral Anemias.**— Visceral douches (1088–1099), alternate (1044), Scotch (1037) short percussion (1035); alternate compress over part (1340), followed by well-protected heat-

ing compress (1344); Mackintosh-covered wet girdle at night; cool enema (75° to 68°), 1 to 3 pints, daily.

## ANEMIA.

***Etiological Indications.***

1. **Increase Blood-Making Process.**—Graduated cold applications (1625). The electric-light bath (1250) is especially valuable as a means of heating before general cold applications (1637); aseptic dietary (1626), substances rich in proteids and fats; rest in bed, if patient is emaciated; out-of-door life; cold air baths (1470); sun baths (1254); sea bathing (1147); massage; manual Swedish movements; electricity; oxygen inhalation. static. 1580

***Clinical Indications.***

2. Neuralgia.— See 1545.
3. Hyperpepsia.— See 1522.
4. Hypopepsia.— See 1521.
5. Chronic Gastro-Intestinal Catarrh.— See 1519, 1529
6. Loss of Appetite.— See 1521, 5.
7. Vomiting.— See 1523, 3.
8. Constipation.— See 1524.
9. Enteroptosis.— See 1525.
10. Gastric Dilatation.— See 1523.
11. Gastric Ulcer.— See 1526.
12. Fever.— Prolonged neutral bath (1130) daily; fomentation to spine (1328) followed by wet-sheet pack (1179).
13. Nervous Excitability.— Neutral bath (1130); heating compress to spine (1344); neutral rain douche (1050).
14. Dropsy.— See 1582.
15. Palpitation of Heart or Aorta.— See 1578, 3, 4.
16. Metrorrhagia or Menorrhagia.— See 1588.
17. Chronic Nephritis.— See 1538.
18. Malarial Cachexia.— See 1490, 17.
19. Vaso-Motor Spasm.— See 1579, 6, 7.

**General Method.**—Cold water is the most valuable of all curative measures in anemia. Apply twice daily, graduating carefully (1625). Autointoxication arising from dilatation (1523) or prolapse (1525) of the stomach, or chronic constipation (1524), is often the principal cause to be combated (1473-1475).

**PERNICIOUS ANEMIA.**

- 1581** 1. **Combat Autointoxication.**— Electric-light bath (1250) vapor bath (1246), or hot-blanket pack (1197), 5 minutes, followed by cold bath (1625) twice a week. Aseptic dietary (1626).
2. **Indigestion.**— See Hypopepsia (1521). Aseptic diet (1626).
3. **Promote General Nutrition and Blood Making.**— Graduated tonic baths daily (1625); ice-bag over the stomach half an hour before each meal. See Anemia 1580.
4. **Cerebral Anemia.**— Rest in bed with foot of bed raised. Warm flannel about the neck to promote cerebral circulation. Warm compress to back of neck if patient is inclined to faint.
5. **General Method.**— The same as for simple anemia (1580).

**GENERAL DROPSY, ANASARCA, OR MALEOLAR EDEMA.**

- 1582** 1. Rest in bed; ice-bag over heart 15 to 30 minutes three times a day; graduated cold treatment twice daily (1625); heating pack to legs (1393); water drinking (1423); sweating procedures when due to renal disease (1250, 1191); wet girdle (1347), changing every 2 hours.
2. **Palpitation.**— See 1578, 3.
3. **Nervous Irritability.**— Prolonged neutral bath (1130) 30 to 60 minutes every other day; alternate spinal compress.
4. **Vomiting.**— Lavage (1401); ice-bag over stomach; hot and cold trunk pack (1367); ice-bag to lumbar region.
5. **Fever.**— Prolonged neutral bath (1130), daily or more often; cold mitten friction (1209); cold towel rub (1213).

**EXOPHTHALMIC GOITER.****1583 Pathological Indications.**

1. **Enlarged Thyroid.**— Ice-bag over gland, continuously, removing for five minutes every half-hour; galvanization of cervical and abdominal sympathetic.
2. **Anemia.**— Carefully graduated cold wet hand rub (1201), mitten friction (1209), and towel rub (1213). See 1580.
3. **Autointoxication.**— Aseptic diet (1626); coloclyster (80°) daily; neutral bath, 20 to 30 minutes daily (1130); water drinking (1423).

4. **Nervous Irritability and Exhaustion.**— Rest in bed; carefully graduated cold baths (1625).

**Clinical Indications.**

5. **General Feebleness.**— Graduated cold applications (1625).
6. **Emaciation.**— Rest; diet rich in fats and proteids (1626).
7. **Palpitation.**— See 1578, 3, 4.
8. **Insomnia.**— See 1564.
9. **Neuralgia.**— See 1545.
10. **Diarrhea.**— See 1529.
11. **Constipation.**— See 1524.
12. **Gastric Irritability.**— Hot and cold gastric compress (1356); revulsive compress (1341). See Chronic Gastritis (1520), Hypopepsia (1521), Hyperpepsia (1522).
13. **Jaundice.**— See 1608.
14. **Tremor.**— Short spinal fomentation (5 minutes) followed by heating compress (1344) for several hours daily.
15. **Contraindications.**— Very hot or cold general applications.

**General Method.**— This disease is probably an autointoxication. As the patients are generally very feeble, the measures employed must be at first very gentle, and must be very carefully graduated to avoid any aggravation of symptoms (1625).

**MYXEDEMA.**

Graduated cold baths (1625); massage; galvanism to abdominal sympathetic; electric-light bath (1250) or other sweating procedure (1246, 1233, 1191) followed by appropriate cold baths (1213, 1216, 1010). Ice-bag over heart during hot applications. Train patient to use of cold douche (1010, 1017, 1625) as soon as possible. Strong percussion douche (1035) to spine when it can be borne. 1584

**General Method.**— This condition is doubtless due to auto-intoxication and lack of some element supplied to the body by the thyroid gland. Hydrotherapy alone is beneficial in many cases, but hydiatic measures may be best employed in connection with the systematic use of the dried sheep's thyroid.

**ARTHRITIS DEFORMANS, RHEUMATIC GOUT.**

1. **General Restorative Measures.**— The diet must be specially nourishing and digestible, rich in fats and proteids (1626). See 1585

Emaciation (1516). A warm, rather dry, and uniform climate is most desirable.

2. Carefully graduated cold applications (1625), preceded by very short hot applications; fomentation (1328) to spine or the electric-light bath (1250) 3 to 5 minutes, and the sun bath (1254), followed by cold mitten friction (1209) are especially suitable; massage; manual Swedish movements; oil rubbing (1232); wet girdle (1347).

**Clinical Indications.**

3. **Fever.**—Prolonged neutral bath (1130) at 92°; fomentation (1328) to spine followed by cold friction (1209) or towel rub (1213).

4. **Frequent Pulse.**—Cold precordial compress (1383) or ice-bag for 15 to 30 minutes three times a day.

5. **Pain in Joints.**—Revulsive compresses (1341) followed by cotton poultice (1388); local vapor bath (1249); local electric-light bath (1250).

6. **Neuralgia of Hands.**—Hot hand bath (1302) followed by cotton poultice (1388).

7. **Radiating Pains.**—Fomentation (1328) to spine three times a day, heating compress (1344) during interval, well protected with mackintosh; revulsive compress (1341) to spine; galvanic or sinusoidal electricity to trunk, arms, or legs, as indicated.

8. **Numbness and Tingling of Hands and Feet.**—Fomentation to spine, hot or alternate sponging of limbs (1204), repeated three times a day; faradic or sinusoidal electricity.

9. **Muscular Cramps.**—Fomentation (1328) or hot immersion of affected parts two or more times daily; during interval, well-protected heating compress (1344); hot sponging; firm bandaging. Protect patient from chill.

10. **Muscular Atrophy.**—Alternate douche (1044), compress (1340) or sponging; massage; massage-douche (1066); sinusoidal electrical current (1446) applied to affected muscles.

11. **Joint Deformities.**—For thickening of synovial membrane or accumulation of fluid in joints or bursæ, apply alternate douche (1044); alternate compress (1340); massage-douche (1066); Apply to joint dry flannel bandage or cotton poultice (1388).

12. **Contraindications.**—Cold douche to painful joints; long sweating processes and prolonged general hot applications.

**General Method.**—Improve the general health by general tonic measures, especially carefully graduated cold baths (1625), massage and general applications of electricity, combating local manifestations of the disease by local applications of massage and other palliative measures above recommended.

#### PELVIC PAIN.

1. Remove all known causes — tight bands, heavy skirts, tight shoes, cold extremities, sexual excess. **1586**
2. Rest in horizontal position, with proper general treatment for any existing general or local morbid condition, as anemia (1580), neurasthenia (1554), hysteria (1553), enteroptosis (1525), constipation (1524), or any discoverable pelvic disease. See 1590, 1591, 1592, 1619.
3. If *neuralgic*, hot hip and leg pack (1389, 1393) or very hot revulsive sitz (pp. 766, 770) three times a day; hot bag over seat of pain, heat to feet and legs. Very hot vaginal irrigation (1413).
4. If *due to chronic congestion*, hot hip and leg pack (1389, 1393) every 2 to 4 hours, with abdominal heating compress (1351); and heating leg packs (1393) during interval.
5. If *due to inflammation or acute congestion*, hot hip and leg pack (1389, 1393) or hot and cold pelvic pack (1370) every 2 to 4 hours, followed by continuous heat to legs with cooling compress to lower abdomen, external genitals and inner surfaces of thighs. Vaginal irrigation (1413) at 105° for 15 minutes every 3 hours, apply ice-bag over seat of pain during hot vaginal irrigation and hot hip and leg pack.

#### DYSMENORRHEA.

1. Rest in bed during period. **1587**
2. **When Due to Ovarian Disease** (beginning before flow). — Hot hip and leg pack (1389, 1393); hot-blanket pack (1197); fomentation (1328) over hypogastrium; hot pelvic pack (1390); revulsive sitz (pp. 776, 770); hot rectal irrigation (1410) followed by hot foot bath (1297) if flow is checked; hot douche (99° to 102°); very hot immersion (105° to 110°) 5 to 8 minutes.
3. **When Due to Uterine Disease** (beginning with and accompanying flow). — Hot hip pack (1389) with hot foot bath



(1297) followed by cold compress to hypogastrium and inner surfaces of thighs for 30 to 40 seconds. For treatment between periods, see 1591.

4. **When Due to Inflammatory Disease of Appendages.**—Hot enema (1406); hot fomentations (1328); hot pelvic pack (1390); hot-blanket pack (1197).

**General Method.**—In addition to the local measures for relief of pain which have been indicated above, it is in most cases necessary to combat some general disorder to which the local disease may be more or less directly related. See Anemia (1580), Neurasthenia (1554), Hysteria (1553). General tonic measures must be employed between the menstrual periods. In chronic ovarian congestion, apply the hypogastric compress (1318) during the night; administer daily the revulsive sitz (pp. 766, 770) or hot pelvic pack (1390), and the very hot vaginal irrigation (1413), 115° to 120°, 15 minutes. In cases of deficient development, as in infantile uterus or vasomotor spasm of the uterine vessels, employ the revulsive sitz, alternate genito-urinary douche (1099), tonic sitz (1309), pelvic and general massage, and local galvanic and sinusoidal electrical applications.

Applications of electricity and surgical measures are often required for permanent relief, but a surprisingly large number of cases are curable without surgery; hence hydriatic measures should be perseveringly tried before resorting to surgical procedures.

#### METRORRHAGIA AND MENORRHAGIA.

1588 1. Hot vaginal irrigation (1413); short hot hip pack (1389); hot foot bath (1297), followed by cold compress to hypogastrium (1314) and inner surfaces of thighs. In obstinate cases, cold vaginal irrigation (1413). Moderately prolonged, very cold, shallow sitz (50° to 65° for 5 to 15 minutes) (1309), accompanied by hot foot bath (1297) when other measures fail; hot douche (1024) to lower spine, hypogastrium, inner surfaces of thighs, twice daily during intervals.

2. **Contraindications.**—Prolonged hot sitz, hot douche, hot leg, foot, and sitz baths, and in some cases even fomentations and hot vaginal irrigation must be avoided. It is equally necessary to avoid short cold applications to the lower spine, abdomen, thighs and feet, as the reflex effects of such applications increase pelvic and uterine congestion.

**General Method.**—It is always highly important to inquire closely for all possible causes of the profuse flow. The cause may be simple anemia (1580) from defective nutrition, constipation (1524), sexual excess, enteroptosis (1525), uterine displacement (1619), ovarian or tubal disease (1592), uterine inflammation or congestion (1591). The most common cause is vegetations of the endometrium, which must be removed by surgical measures. The operation must be followed by treatment for chronic metritis (1591). In many instances, several of these conditions may be combined. Such general and local measures must be employed as have been suggested above and elsewhere, and it is rare that treatment is not very speedily followed by most gratifying results.

#### AMENORRHEA.

1. Tonic sitz (1309); cold pelvic pack (1390, 1); graduated 1589 tonic baths (1625) twice daily; short very cold douche to lower spine (1076), hypogastrium and inner surfaces of thighs; pelvic massage daily, and especially when period is due.

2. **Suppressed Menstruation.**—Short cold douche to spine, thighs, and hypogastrium (1099) daily or twice a day; hot foot bath (1297) or hot-blanket pack (1197) during interval between the periods. Intrauterine applications of the faradic or sinusoidal electrical current; hot hip pack (1389); warm vaginal irrigation (1413), 95° to 100°.

3. **General Method.**—It is very necessary to treat the patient rather than her malady. Apply such measures as may be required for relief of anemia (1580), chlorosis (1579), indigestion (1521–1523) or any other disturbance of the nutritive functions.

#### PELVIC PERITONITIS, CELLULITIS.

##### *Etiological Indications.*

1. Surgical and puerperal sepsis; care to avoid exposures 1590 at menstrual periods; protection of feet and legs in damp and cold weather; proper clothing.

##### *Pathological Indications.*

2. **Increase Resistance.**—Cold mitten friction (1209) or cold towel rub (1213) two to four times a day, protecting pelvic viscera by simultaneous hot foot or leg pack (1393, 1394) or by hot bag to sacrum and cold compress to hypogastrium.

3. **Combat Local Inflammation.**—Hot hip and leg pack (1389, 1393) 20 minutes every 2 hours; during intervals, cold compress (1318) at 60° to hypogastrium, pudenda and inner surfaces of thighs, with heat to feet and legs, or ice-bag over seat of pain, hot bags or fomentations to feet, hips and thighs; hot and cold pelvic compress (1364) with ice-bag over seat of pain; continue 20 to 40 minutes, and repeat when needed; hot vaginal irrigation (1413) (110° to 120°), one gallon, every 4 hours.

4. **Encourage Resolution.**—After acute stage has passed, apply alternate compress (1340) for 30 minutes three times a day; during interval, heating compresses (1344), changing every 2 hours, or as soon as well warmed; graduated tonic baths (1625); alternate vaginal irrigation (110°, 80° to 70°); later, pelvic massage.

#### **Clinical Indications.**

5. **Pain.**—Fomentation (1328) or revulsive compress (1341) every 2 to 4 hours, or oftener if necessary.

6. **Constipation.**—Large hot enemas (1406) twice a day during acute pain and inflammation; later, graduated cold enema (1409).

7. **Chill.**—Anticipate chill by wrapping patient in warm blankets with hot bags to trunk and limbs; hot water drinking (1429).

8. **Septic Fever.**—Add to local measures, if fever is high, hot-blanket pack (1197) 10 to 15 minutes, followed by sweating wet-sheet pack (1183, 1191) prolonged neutral bath (1130). If suppuration occurs, surgical interference is generally indicated.

9. **Anemia.**—See 1580.

10. **Contraindications.**—Avoid cold immersions; partial cold applications, such as the cold-mitten friction and the cold-towel rub, must be used instead.

#### **CHRONIC METRITIS AND PELVIC CONGESTION.**

1591 1. Graduated cold applications (1625); hot vaginal irrigation (1413), 10 to 15 minutes, twice daily; hot-blanket pack to legs (1393) with cold pelvic pack (1390), continued to sweating stage, followed by cold friction (1209, 1213) or wet-sheet rub (1216).

**Clinical Indications.**

2. **Pain.**—Prolonged neutral sitz bath (1312) 95° to 97°, duration, 15 to 20 minutes.

3. **Leucorrhea.**—In addition to the above measures, antiseptic vaginal irrigation, bichloride 1 to 5,000, or permanganate 1 to 200. In certain cases, cool irrigation, 75° to 65°, produces better results than hot irrigation. Constipation (1524) and portal congestion (1279) must be relieved. Cervical catarrh and erosions often require the use of the curette.

4. **Acute Inflammation.**—If attacks of inflammation occur, rest in bed; hot hip or leg pack (1389, 1393); hot and cold pelvic compress (1364) or hot and cold pelvic pack (1370).

**OVARITIS AND SALPINGITIS.**

**A. Acute Form.**

1. Rest in bed; hot vaginal irrigation (1413) twice daily; hot pelvic pack (1390); hot leg pack (1393) or hot foot bath (1297) twice daily, followed by cold friction (1209). If sup-  
puration of tubes occurs, operation is usually necessary. During the first few days, ice-bag over inflamed part, interrupted at intervals of 1 to 3 hours by fomentation for 15 minutes or hot and cold pelvic compress (1364) for 30 minutes; heat to limbs.

2. **Contraindications.**—General cold applications, and cold applications to the feet.

**B. Chronic Form.**

1. Rest in bed with hips elevated; neutral bath (1130) 15 to 30 minutes three times a week; hot pelvic pack (1390) morning and night followed by general cold friction (1209) and heating compress (1344) over the hypogastrium to be retained until the next hot application. The heating compress should be well covered. If pain is intense, employ a hot hip and leg pack (1389, 1393) twice daily, with the heating compress during the interval. The circulation of the lower extremities may also be encouraged by a prolonged heating compress applied to each leg separately (1393) 2 or 3 hours once a day. Vigorous cold friction with towel or mitt should be applied to the legs on removal of the pack (1209-1213). Keep the feet and legs warm.

2. Hot vaginal irrigation twice daily (1413); hot rectal irriga-

tion (**1410**) once daily if exudate in pelvis is extensive; sinusoidal current with very rapid alternations; pelvic massage.

3. General tonic applications (**1625**); general massage; manual Swedish movements; sun baths (**1254**); out-of-door exposure with proper protection, carefully avoiding chill; fat and blood-building diet. See Emaciation (**1516**).

4. If suppuration is present, drainage. Removal of the diseased appendages is sometimes required, but in most cases this may be obviated by the proper application of hydiatic measures at the outset.

#### STERILITY IN WOMEN.

- 1593** When not due to organic diseases, may often be cured by a course of hydiatic treatment. A course of graduated cold applications (**1625**) is most efficient. The cold rubbing sitz (**1309**) is highly useful. Remove catarrhal conditions of uterus and vagina and subinvolution by means of hot vaginal irrigation (**1413**) followed by tonic sitz (**1309**).

#### PROSTATITIS.

- 1594** 1. Revulsive sitz bath (p. 770); hot rectal irrigation (**1410**); irrigation of bladder (**1411**), if bladder does not empty itself. Neutral sitz (**1312**), 30 to 60 min. Cold mitten friction (**1209**).
2. **When painful**, revulsive sitz (pp. 770, 766). Fomentation or the Scotch douche to perineum (**1084**), with little pressure. Rectal irrigation (**1410**) in chronic cases. Hot enema (**1406**) when bowels are constipated.
3. **Chronic Enlargement with Induration.**—Good results often follow the use of the following measures: alternate rectal irrigation (**1410**); shallow cold rubbing sitz (**1309**) 4 to 8 min.; cold pelvic pack (**1390**) with hot leg pack (**1393**); massage of prostate; graduated tonic baths (**1625**); ice-bag to perineum, with hot hip and leg pack, 15 to 30 min.
4. **Contraindications.**—When pain is present, avoid general cold baths, cold sitz and foot baths, and chilling of feet. Absolute sexual continence is essential.

#### ACUTE ORCHITIS.

- 1595** Rest in bed. Elevation of scrotum upon a tense broad band of cloth placed about the thighs close to hips. Hot pelvic pack

(1390) or hot hip pack with cold compress over genitals (1364), every 3 hours. During intervals, cold compress at 60° over perineum, genitals, and hypogastrium, with heat to feet. Tepid enema (1404) twice daily; cold mitten friction (1209) or cold towel rub (1213) twice a day; prolonged neutral bath (1130) or neutral pack (1182) to control temperature if necessary.

#### SPERMATORRHEA.

1. Graduated cold applications (1625) to improve general condition. 1596

#### *Clinical Indications.*

2. **General Nervous Irritability.**—Prolonged neutral bath (1130) at night. See Neurasthenia (1054).

3. **Irritable Prostate, Irritable Urethra.**—Prolonged neutral sitz (1312), 30 to 60 minutes, at bedtime; Scotch douche to perineum (1084) with little pressure; tepid rectal irrigation (1410) at 80°.

4. **Relaxed Ejaculatory Ducts.**—Rubbing cold sitz (1309), cold or alternate irrigation of rectum (1410); cold douche to feet and legs (1082); cold percussion douche to lower spine (1074). Bowels must be kept regular by the cool enema (1405) if necessary, and proper diet. An aseptic dietary (1626) is essential. Condiments must be strictly avoided. Cooling sound (1416), 70°, for 5 minutes daily.

5. **Contraindications.**—When losses are frequent or parts irritable, avoid cold sitz baths and prolonged hot baths.

#### SEXUAL IMPOTENCE.

Graduated cold baths (1625); cold douche to spine (1074), 1597 especially lower part; cold rubbing sitz (1309), beginning at 60°, lowering temperature 5° daily to 60°; duration of bath 3 to 8 minutes. Patient should be vigorously rubbed to prevent chilling. If urethral irritation is present, short (2 to 4 minutes) revulsive sitz (pp. 766, 770); cooling compress (1395), 5 minutes daily.

#### PRIAPISM.

Immersion bath (1112), 100° for 1 minute, 90° for 5 minutes; 1598 gradually lower temperature to 75°, and continue for 5 minutes;

lower minimum temperatures 1° daily to 60°; hot douche to lower spine (1074) and thighs for 30 seconds; follow by general neutral douche (1031) 2 to 3 minutes with considerable pressure (20 to 30 lbs.); prolonged general neutral bath (1130) 30 to 40 minutes; Spinal affusion (1103) 5 minutes, 98°.

#### IRRITABLE RECTUM.

##### 1599 *Pathological Indications.*

1. **Increase Vital Resistance.**—Graduated tonic baths (1625).

2. **Combat Local Inflammation.**—Prolonged cool sitz (1308), 75° for 15 minutes; cooling compress (1395) to nates, anus, perineum, and genitals; cleanse rectum after each stool; render fecal matters soft and bowels regular, by diet and other measures. See 1524. Rest in horizontal position; hot rectal irrigation (1410) daily or oftener; prolonged cold anal douche (1087) with little pressure.

##### *Clinical Indications.*

**Pain.**—Revulsive compress (1341); ice-bag to anus; fomentation (1328) to nates and perineum; hot hip pack (1389); hot foot bath (1297); hot hip and leg pack (1389, 1393); hot vaginal irrigation (1413).

**Spasm.**—Hot sitz (1311); sitting over hot water (p. 707).

**Constipation.**—See 1524.

**Pain in the Back.**—Scotch douche to back (1037); hot sitz (1311); wet-girdle (1347).

#### HEMORRHOIDS.

1600 1. **Portal Congestion.**—Running cold foot bath (1296); hot foot (1297) or leg bath (1299); hot leg pack (1393); scotch douche to feet and legs (1082); wet girdle (1347). (See also 1278, 1279).

2. **Constipation.**—See 1524.

3. **Diarrhea.**—See 1528.

4. **Irreducible Prolapse.**—Rest in bed; lying on the face; knee-chest position if required. Ice compress (1314); bathing parts with ice water; daily small cold enema after stool; relieve bowels while lying in horizontal position; avoid straining; abdominal supporter. In many cases, surgical measures are necessary.

5. **Inflamed Hemorrhoids.**—Rest in bed with feet and hips elevated; knee-chest position if necessary; ice-cold compress (1395) pressed firmly against anus; ice suppositories; very shallow ice-cold sitz.

6. **Pain.**—If due to inflammation, short hot fomentation (1328) followed by cold compress applied to the anus and nates (1395), with hot foot bath (1297) at the same time; repeat fomentation hourly or every two hours; prolonged tepid sitz (1304), temperature 85° to 80°; hot hip and leg pack (1389, 1393), followed by cold compress over nates, perineum, and lumbar region (1395).

# SYPHILIS.

1. **First and Second Stages.**—Eliminative baths—vapor 1601 (1246), electric-light (1250), sweating pack (1191), followed by short cold tonic applications—wet-sheet rub (1216), graduated douche (1017), or cold towel rub (1209); outdoor life; regular habits, aseptic dietary (1626), especially careful avoidance of meats, tea and coffee, tobacco, alcoholic drinks, and all indigestible and unwholesome foods.

2. **Skin Eruptions.**—Prolonged neutral bath (1130).

3. **Syphilitic Cachexia.**—Electric-light baths (1250); sun baths (1254); water drinking (1423); wet girdle (1347); cold mitten friction (1209); cold towel rub (1213); rubbing wet-sheet (1216).

4. **Anemia Due to Long-Continued Use of Mercury or Iodide of Potash.**—Galvanic bath (1457) two or three times a week, and carefully graduated tonic baths (1626); water drinking (1423).

5. **Nocturnal Pains.**—Prolonged neutral douche (1031), 5 minutes at bedtime; fomentation to the spine; alternate compress to spine.

6. **Insomnia.**—Prolonged neutral bath (1130) at bedtime; wet girdle (1347) to be worn during the night; See 1564.

7. **Syphilitic Ulcers.**—General eliminative and tonic measures, sweating bath daily (1250, 1191) followed by short cold applications (1625); prolonged immersion of the affected parts (1107), or antiseptic dressing.

8. **Indolent Ulcers.**—Alternate spray to ulcer, with measures indicated above, twice daily for 10 minutes.



9. **To Induce Absorption of Gummata.**—A fruit dietary (1627) for 3 days, prolonged sweating bath (1191) daily, electric-light bath (1250), vapor bath (1246), or sweating wet-sheet pack followed by a vigorous cold application, as a cold douche or rubbing shallow (1174). Continue long as indicated.

10. **Contraindications.**—Avoid prolonged very cold baths, especially cold immersions. Such baths are especially harmful when mercury is being taken. Avoid prolonged hot baths in cachectic and anemic patients, also when patient's temperature is elevated.

**General Method.**—The important thing to be accomplished in the treatment of this malady is the reconstruction of the body by the regulation of the patient's habits, and by the employment of proper hydiatic measures. Hydrotherapy often affords an excellent means of determining the diagnosis in a doubtful case by bringing out the characteristic eruption.

#### INFLAMMATIONS OF THE EYE.

1602 1. **External Inflammations.**—Light fomentations (1328) for 15 minutes every 2 hours; frequently renewed cooling (1318) compress during interval.

2. **Inflammations of Eyeball.**—A fomentation (1328) covering the eye and extending to the forehead, for 15 to 20 minutes or until the skin is well reddened (1282). Repeat as often as necessary to relieve pain. Employ the frequently renewed (5 to 15 minutes, 60°) heating compress (1344, 1282) during the interval between hot applications.

#### SKIN DISORDERS.

1603 **Chilblains.**—Alternate foot bath (1298); Scotch douche to feet (1037); alternate douche (1044, 1082); hot foot bath (1297) followed by flowing foot bath (1296); foot pack (1394).

1604 **Burns.**—The evaporating compress (1324); the cool irrigating compress (1326); if very extensive, the prolonged or continuous neutral bath (1130).

1605 **Erythema.**—Cool evaporating compress (1324), or irrigating compress (1326); neutral compress (1339).

1606 **Pruritus.**—Prolonged neutral bath (1130); copious water

drinking (1423); large enema (1404); daily aseptic dietary; (1625) effervescing bath (1139).

**Eruptions.**—*If dry*, not irritable, prolonged neutral bath (1130). *If scaly*, alkaline bath (1463). *If moist* and irritable, cool evaporating compress moistened with soda solution, 1 ounce to the gallon; emollient bath (1462). *If skin is thickened*, as in chronic eczema, hot or alternate spray or compress for 10 to 15 minutes three times a day. If skin is extensively damaged, as in pemphigus, confluent smallpox, bad burns, the continuous neutral immersion bath (1130) until the skin is healed. 1607

**Jaundice.**—Copious water drinking (1423); large enema (1404) twice daily; sweating bath for 15 minutes, —electric-light (1250), vapor (1246), hot immersion (1126), wet-sheet pack (1179), followed by prolonged neutral bath (1130). Administer sweating bath once daily, or even twice, if patient is not too weak. For general tonic effects apply cold mitten friction (1209) or cold towel rub (1213) twice daily. Alternate compress over the liver twice daily, with heating compress (1344) over the liver or flannel covered wet girdle (1347) during intervals. 1608

**Dry Skin.**—Short sweating bath, electric-light (1250), vapor (1246), hot air (1233), Turkish (1239), hot immersion (1126), hot-blanket pack (1197), dry pack (1192), sweating wet-sheet pack (1187, 1191), followed by a cold bath suited to the patient's general condition (1625), and massage (fulling and friction) (1461). 1609

**Hyperidrosis.**—Vapor bath (1246), sweating electric-light bath (1250), followed by Scotch douche to spine (1037, 1074) and general cold douche (1010). 1610

**For sweating feet**, Scotch douche (1037) to feet with extremities as great as possible; alternate foot bath (1298), heating compress to feet during night (1394) with cold friction of feet in the morning on rising.

**Baldness.**—General tonic measures (1625); shampoo of scalp with cold water three times a day; some antiseptic lotion to destroy the parasitic cause of the disease. 1611

**DRUG HABITS.****A. Alcoholism.**

**1612 General.**—1. Aseptic dietary (1626), especially fruits. Meats and flesh foods must be strictly prohibited, also meat juices, broths, and all preparations of flesh. Fomentation (1328) over the stomach twice a day with wet girdle (1347) between applications; short sweating baths,—electric-light bath (1250), sweating pack (1191) followed by wet-sheet rub (1216). Graduated cold baths (1625) twice a day.

2. **Insomnia.**—Neutral bath at bed-time, 94° to 96°, 20 to 60 min.; wet girdle at night. See Insomnia (1564).

3. **Vomiting.**—Ice pills, ice-bag over stomach, hot and cold gastric compress (1362). See 1519, 3.

4. **Delirium Tremens.**—Rest in bed; hot immersion bath (1126) 5 minutes, hot-blanket pack (1197) followed by sweating wet-sheet pack (1179, 1191); neutral bath (1130) 1 to 2 hours or longer twice a day; ice-cap (1314, 1371); hot fomentations (1328) over stomach and abdomen, every 3 hours for 15 minutes; during interval, heating compress (1344) changing every 30 to 60 minutes. Copious water drinking (1423); large enema (1404) daily. Exclusive fruit diet (1627) for 2 or 3 days.

5. **Counteract Narcotic Effects of Alcohol.**—Cold shower; water drinking (1423) or enema (1404) followed by short cold douche to spine (1074) and lower sternum. Repeat every hour or two if necessary, until the toxic effects disappear. Gastric lavage (1401), followed by cold or alternate irrigation (1401).

6. **Nephritis.**—Usually present in acute alcoholism. See 1537.

7. **Gastritis.**—See 1519.

**General Method.**—The patient must be placed in a proper environment; isolation and confinement may be required. Suitable mental and moral influences must be brought to bear.

**B. Opium, Cocaine, and Chloral Habits.**

1. Rest in bed. Sweating baths,—electric-light bath (1250), vapor bath (1246) twice a day for 3 days before withdrawing the drug. Follow bath by vigorous cold applications. While withdrawing the drug, the leading symptoms may be successfully combated as follows:—

**2. Nervousness, Restlessness, "Indescribable Sensations."**

— Prolonged neutral bath (1130) 92° to 94°, ten minutes; neutral douche (1031), 92°, 2 to 4 minutes.

**3. Cardiac Weakness.**— Cold precordial compress (1383) or ice-bag over heart (1314); alternate applications to spine (1342); cold mitten friction (1209); cold towel rub (1213), repeating treatment hourly if necessary.

**4. Vomiting.**— Hot and cold trunk pack (1367); ice-bag over stomach and spine; hot-leg pack (1197).

**5. Diarrhea.**— Hot enema (1406) after each movement; cold abdominal compress (1284, 1314) changed every 30 minutes.

**6. Local Pain.**— Revulsive compresses (1341); alternate or hot and cold compress (1340, 1356).

**7. Insomnia after Withdrawal.**— Wet-sheet pack (1179); prolonged neutral bath, 20 to 60 minutes (1130); prolonged neutral spray (1031) 3 to 5 minutes; heating leg pack (1393); wet girdle (1347); cold head cap (1314, 1371). See 1564.

**General Method.**— Same as for alcoholism (1612). Withdraw gradually within two or three days.

**C. Tobacco Habit.**

Drop the drug at once. Put the patient to bed. Sweating procedures,— electric-light bath (1250), vapor bath (1246), sweating wet-sheet pack (1179, 1191), twice daily; follow with short cold application, as shallow bath (1174), wet-sheet rub (1216), or cold douche (1010, 1023). Alternate spinal compress (1342) three times a day; wet girdle (1347) day and night, renewing three times daily. Copious water drinking (1423); large colocylyster (1407) daily.

**D. Tea and Coffee Habit.**

**1.** Discontinue the use of the drug at once. If necessary, employ some harmless cereal substitute. Neutral bath (1130) at bedtime. Fomentation over abdomen (1328); alternate sponging of the spine (1342); cold mitten friction (1209) or cold towel rub (1213) before rising in the morning. Wet girdle (1347) night and day, changing morning, noon, and night; short sweating wet-sheet pack (1191) or vapor bath (1246) two or three times a week followed by a cold application (1625).

2. **Constipation.**— Graduated enema (1409). See 1524.
3. **Diarrhea.**— Neutral enema (1404) after each movement; cold abdominal compress (1318) every half-hour.
4. **Nervous Headache.**— See 1554, 15.
5. The diet should consist chiefly of fruits (1627) and liquid foods (1628) for a few days; the patient should be gradually accustomed to a dry dietary (1629).

#### APPLICATIONS OF HYDROTHERAPY IN SURGICAL CASES.

- 1613 Contusions.**— Fomentation (1328) three times a day, 10 to 15 minutes, with protected heating compress (1344) during the interval; if heat and swelling are great, change the compress every 15 minutes; as swelling and heat diminish, renew less frequently.
- 1614 Fractures.**— Apply a fomentation (1328) or a revulsive compress (1341) for 10 or 15 minutes before application of the permanent dressing. When possible, the revulsive compress should be applied two or three times daily. This will afford the patient much comfort in relief from pain, and will expedite the healing process. Apply massage to portion of the limb which is accessible. In cases of compound fractures which are inoperable, the continuous neutral bath may sometimes be employed with advantage.
- 1615 Dislocations.**— If necessary, apply large fomentations (1328) over the joint, or a hot immersion bath (1026) to relax the muscles before reduction; after reduction, apply the revulsive compress (1341) three times daily with heating compress (1344) during intervals. Apply massage to the limb, carefully.
- 1616 Sprains.**— Very hot foot bath (1297) or hot pour (1103) for 15 minutes three times a day; firm bandage and absolute rest during intervals. Derivative massage (1225) the second day, increasing the vigor of the application and approaching nearer to the joint daily. Gentle massage and flexion of joint after third day.
- 1617 Pott's Disease.**— In the early stage, when fever is present, rest in bed with careful tonic hydriatic measures in addition to the proper surgical treatment. Cold wet-hand rubbing (1201), the cold mitten friction (1209), and the cold towel rub are especially valuable measures. Later, more vigorous measures may be employed (1625). See Pulmonary Tuberculosis (1508).

**Scoliosis.**—The treatment of this and all other forms of spinal curvature due to deficient muscular development or irregular muscular action, may be greatly facilitated by combining with corrective gymnastics, massage, and electricity, the tonic and energizing effects of hydrotherapy. Administer daily or twice daily, carefully graduated tonic measures (1625), and in addition apply to the back the cold jet (1074), cold percussion douche (1035), or alternate douche (1044). 1618

**Uterine Displacements.**—Retroversion, procidentia, and some other forms of uterine displacement require mechanical and surgical treatment in most cases, but hydrotherapy is almost essential for a radical cure. Administer daily vaginal irrigation (110° to 115° when pain is present, 80° to 70° when pain is not a prominent symptom); tonic sitz (1209); graduated tonic measures (1625). See also Enteroptosis (1525). 1619

**Abdominal Surgery.**—Hot vaginal irrigation (1413) daily, the hot or cool cleansing enema or coloclyster daily (1407), water drinking (1423), and general tonic hydriatic measures (1625) either alone or in combination with eliminative procedures, electric-light bath (1250), vapor bath (1246), hot-air bath (1233), sweating pack (1191), are of the highest value as means of preparing a patient to undergo the ordeal of an abdominal operation. In suitable cases, in which immediate operation is not imperative, these simple measures, combined with an aseptic dietary (1626), employed for one or two weeks, enormously increase the patient's prospects for a safe and quick recovery, and prevent many of the complications to which this class of patients are especially liable. Tonic hydriatic procedures are equally useful in hastening the progress of convalescence; and such measures as the cold wet-hand rub (1201) and the cold mitten friction (1209) are most valuable means of increasing vital resistance, energizing the heart and central nervous system, and combating shock and collapse immediately after operation and may be advantageously employed two or three times a day during the weeks following. 1620

A hot enema (1406), hot vaginal irrigation (1413), hot foot bath (1297), even a hot bag to the spine or the epigastrium, will often obviate the use of an opiate to relieve the suffering in a laparotomy case, a very important consideration as every abdominal surgeon will recognize.

Pelvic inflammation following operation should be combated by the measures elsewhere indicated. See **1590**.

The ice-bag renders invaluable service in combating threatened cardiac failure; Apply over the heart for 15 minutes every 2 hours when necessary, but not continuously. The ice-bag to the throat or over the stomach, or applied to the spine opposite, will often check vomiting. Persistent vomiting may be relieved in many cases by gastric lavage, whether following an abdominal operation or in any case after the use of an anesthetic.

**1621 Surgical Shock.**—Hot bags and blankets about the patient; hot enema (**1405**); alternate compress to spine (**1342**); fomentation to spine (**1328**) immediately followed by cold mitten friction (**1209**); ice-bag over heart (**620**) for 15 minutes every 2 or 3 hours; hot or alternate irrigation of stomach (**1401**).

**1622 Anesthesia.**—Cold compress (60° F.) or ice-bag over heart during operation. Change every 15 minutes, with rubbing of chest until red at each change. After ether, apply heating chest pack (**1374**) to be changed every 4 hours. In all cases when not contraindicated, as in rectal cases, for example, administer an enema at 96° to encourage renal activity. Control vomiting by ice-bag to throat, over stomach, or to the spine opposite. Lavage, if bilious or fecal vomiting occurs and is persistent.

**1623 Hemorrhage.**—Hydriatic procedures, both hot and cold, afford most admirable means of checking hemorrhage when properly used, as has been elsewhere indicated. See **697** and **1496**, 4.

**1624 Surgical Fever.**—The various antipyretic measures which have been elsewhere recommended (**711-745**) are of equal value in the treatment of febrile conditions due to surgical procedures, or to traumatism. The ice-bag (**1314**), the cooling compress, (**1318**) and the frequently renewed heating compress (**1344**) are of great service in combating local inflammation, which is a most common cause of febrile conditions in surgical cases. The cold mitten friction (**1209**), cold towel rub (**1213**), cool enema (**1405**), cold head compress (**1371**), and usually copious water drinking (**1423**), are measures of the greatest value in combating surgical fever and preventing septic infection by building up general vital resistance.

**GRADUATED SCHEME FOR TONIC COLD APPLICATIONS.**

1. **Wet-Hand Rubbing (1201).**— In extremely feeble patients **1625** apply to back only, then from day to day increase the area, adding chest, arms, and lower legs; then cover arms, chest, back, and entire legs; finally the entire surface. Begin the application with water at 65° or even 70°, and lower the temperature 1° or 2° daily to 40°, or even to 34°.

2. **Cold Mitten Friction (1209).**— Begin with water at 60°, dipping once only. Lower the temperature 1° or 2° daily to 40°, then gradually increase the number of dips from one to four.

3. **Cold Towel Rub (1213).**— Begin at 65°; lower the temperature 1° or 2° daily to 40°. Wring towel at first very dry. Wring less from day to day, until a saturated towel is used.

4. **Wet-Sheet Rub (1216).**— At first wring the sheet very dry, in water at 65°. Lower temperature 1° daily to 55°; wring sheet less dry at each application till a saturated sheet is used. Increase the duration of application from ½ minute to 2 minutes.

5. **Dripping Sheet (1217).**— The same as preceding until rubbing is completed, then, the sheet being well warmed, a pail of water 5° lower than the water in which the sheet was wet is poured over the patient and the rubbing renewed. This may be repeated three or four times.

6. **Shallow Bath (1174).**— Begin at 75°; lower temperature 1° daily to 60°; duration at first ½ minute, gradually increasing to 3 minutes.

7. **Pail Douche (1103).**— Begin at 75°; lower the temperature 2° daily to 60°; at first two pails only, gradually increase to six.

8. **Cold Douche (1010).**— Temp. 70° to 60°. Precede by a warm shower. Lower the temperature 1° daily, increasing the pressure; the duration is also increased from 5 or 10 seconds to 15 or 20 seconds. Percussion douche (1035) to spine when possible.

**ASEPTIC DIETARY.**

Meats of all sorts, oysters, fowl, game, meat juices, beef tea, **1626** animal broths, and all meat preparations are carefully and rigidly excluded because of the presence of tissue wastes, uric acid, crea-



tin, creatinin, and other toxic substances, together with ptomains, the product of putrefactive change.

Coarse vegetables, as cabbage, celery, lettuce, roots of all sorts, string beans, spinach, and greens, must generally be avoided, for the reason that their indigestibility leads to their retention in the stomach and colon, and thus encourages fermentative processes. Cauliflower, tender asparagus roots, green peas, purées of peas, beans, and lentils, excluding the skins of these seeds, are allowable, if not the very best. Eggs in the form of egg-nog, prepared without wine or brandy, slightly boiled or poached eggs, and soft custards, prepared without sugar, are readily taken. In many cases of gastric dilatation, eggs must be avoided. Raw, fresh milk is admissible in a small proportion of cases only. In the majority of cases, milk is well tolerated only in the form of kumyss, kumyzoon, buttermilk, cottage cheese, peptonized milk, junket, or in combination with cereals, as in milk gruel or porridge, and in not a few cases nothing containing milk can be eaten without injury.

Ripe fruits of all sorts are of the highest value because of the germ-destroying acids which they contain. Fresh fruits are best, but cooked fruits are valuable. Cane sugar as sweetening is admissible only in small quantities. Some fruits, as prunes and figs, are most digestible in the form of purées. Olives should be taken only when thoroughly ripened, as indicated by a black or very brown color. Dried fruit must be very thoroughly cooked. Fresh fruits, with hard flesh, should be discarded, especially apples, pears, and cherries that are not thoroughly ripened. Fruit juices, especially grape juice, orange juice, and the juice of limes and lemons or raspberries, and blackberries, and jellies made without sugar, are wholesome. Preserves and pickled fruits are indigestible, and must be discarded.

Cereals have a high nutritive value, and are readily digestible when cooked at a sufficiently high temperature (300° to 320°), to thoroughly dextrinize the starch, as in zwieback, granose, granut, granola, browned rice, and crystal wheat. Mushes, farinaceous gruels, blancmange, boiled potatoes, mashed potatoes, puddings, farinaceous desserts, fermented breads, dumplings, ordinary crackers, biscuit, and most ordinary cereal preparations are difficult of digestion in the dilated or feeble stomach, and give rise to fermentation and other changes and encourage gastrointestinal catarrh.

Malt, malt honey (maltose), honey, if sterilized by heating in a double boiler at boiling point for half an hour, malted milk, malted nuts, and bromose, represent preparations which contain starch in the predigested form of maltose (in honey, levulose, and glucose).

Nuts are practically free from starch, consisting chiefly of fats and albuminous substances. They closely resemble meat in composition, but are more nourishing and palatable when properly prepared. They may be eaten fresh or crushed in the form of nut butter and various other combinations and preparations, such as nuttolene, protose, nut meals, bromose, and malted nuts. Ordinary fresh nut meats are very digestible if thoroughly chewed. Peanuts are more nearly allied to beans than to nuts, and must be cooked to render them digestible; roasting renders them very indigestible, unless very carefully managed.

**Fruit Diet.**—When rapid sterilization of the alimentary canal is required, fasting, or better still, an exclusive fruit dietary, is the best course. Fruits consist chiefly of water, with a small amount of thoroughly digested starch in the form of fruit sugar or levulose, and various acid flavors, and almost nothing requiring the action of the digestive fluids. It is important that the fruit should enter the stomach in the form of a smooth pulp. Fruit swallowed in masses is very difficult of digestion. Imperfectly ripened apples or pears, and grapes swallowed without separating the seeds are often a source of indigestion, being retained so long in the stomach that fermentation occurs. Fruit skins and seeds should always be rejected. 1627

When the dietary consists wholly of fruit, food may be taken four times a day, and the patient may be allowed to take as much as he likes.

A modified fruit dietary is often sufficient. At dinner the patient takes fruits and grains, and perhaps a small amount of nuts or nut preparations, with fruits only for breakfast, and the same for supper, if a third meal is taken.

Intestinal asepsis may also be promoted by an exclusive dietary of acid buttermilk or kumyss. The patient should take three or four quarts of kumyss in four portions, say at 7 A. M., 11 A. M., 3 P. M., 7 P. M. Zwieback, or toasted granose flakes or biscuits, may be eaten at the 7 A. M. and 3 P. M. meals.

An exclusive diet of fruit or kumyss is usually not required for more than a short period, as two to six days. If greatly prolonged, the patient will be weakened.

An aseptic dietary is best for all, sick or well. It is especially demanded in typhoid and all other acute fevers, in the rheumatic or uric acid diathesis, in diabetes, obesity, and other nutritive disorders, in indigestion accompanied by a dilated stomach or a prolapsed stomach, in intestinal catarrh and all cases of bacterial infection of the stomach or intestines, in infectious jaundice, arteriosclerosis, hepatic cirrhosis, all forms of autointoxication, in Bright's disease of the kidneys, malarial cachexia, pulmonary tuberculosis, eczema, and other forms of skin disease, apoplexy, neurasthenia, anemia (Haig has shown that flesh-eating causes anemia in consequence of the uric acid present), especially in pernicious anemia, and acute infections and inflammatory disorders, visceral inflammations of every description,—acute and chronic,—epilepsy, insanity, hysteria, in diseases of children of all forms, in insomnia, before and after grave surgical operations, in the treatment of the alcohol, morphia, cocaine, and tobacco habits, and most acute and chronic disorders.

Indigestible substances and dishes of all sorts must be avoided. In this list must be included pickles, spiced pickles, green olives, preserved and brandied fruits, fried foods, rich pastry, cheese, griddle cakes, ices, ice-cream, tea, coffee, cocoa, beer, and alcoholics of every description. Condiments of every sort must also be interdicted, as mustard, pepper, peppersauce, ginger, cayenne, capsicum, horseradish, chillies, curries, and hot sauces of every sort.

- 1628 **Liquid Diet.**—Fruit juice, malted nuts, almond cream, gluten gruel, granola, softened zwieback, malted milk, buttermilk, kumyss, kumyzoon, kumyss-nog, protose broth, vegetable broth, fruit soup.
- 1629 **Dry Diet.**—Toasted granose flakes, toasted granose biscuit, zwieback, toasted whole-wheat wafers, toasted wheat sticks, blanched almonds, blanched filberts, steamed figs, bromose, malt honey, malted nuts, nuttolene, nuttose, granola, granut.
- 1630 **Dextrinized Cereals.**—Well-toasted bread, zwieback, browned or roasted rice, parched wheat or corn (gofio), granose, granola, granut, crystal wheat, toasted wheat flakes.
- 1631 **Malted or Predigested Foods.**—Syrupy extracts of malt, malt honey, malted milk, malted nuts, bromose, granut.

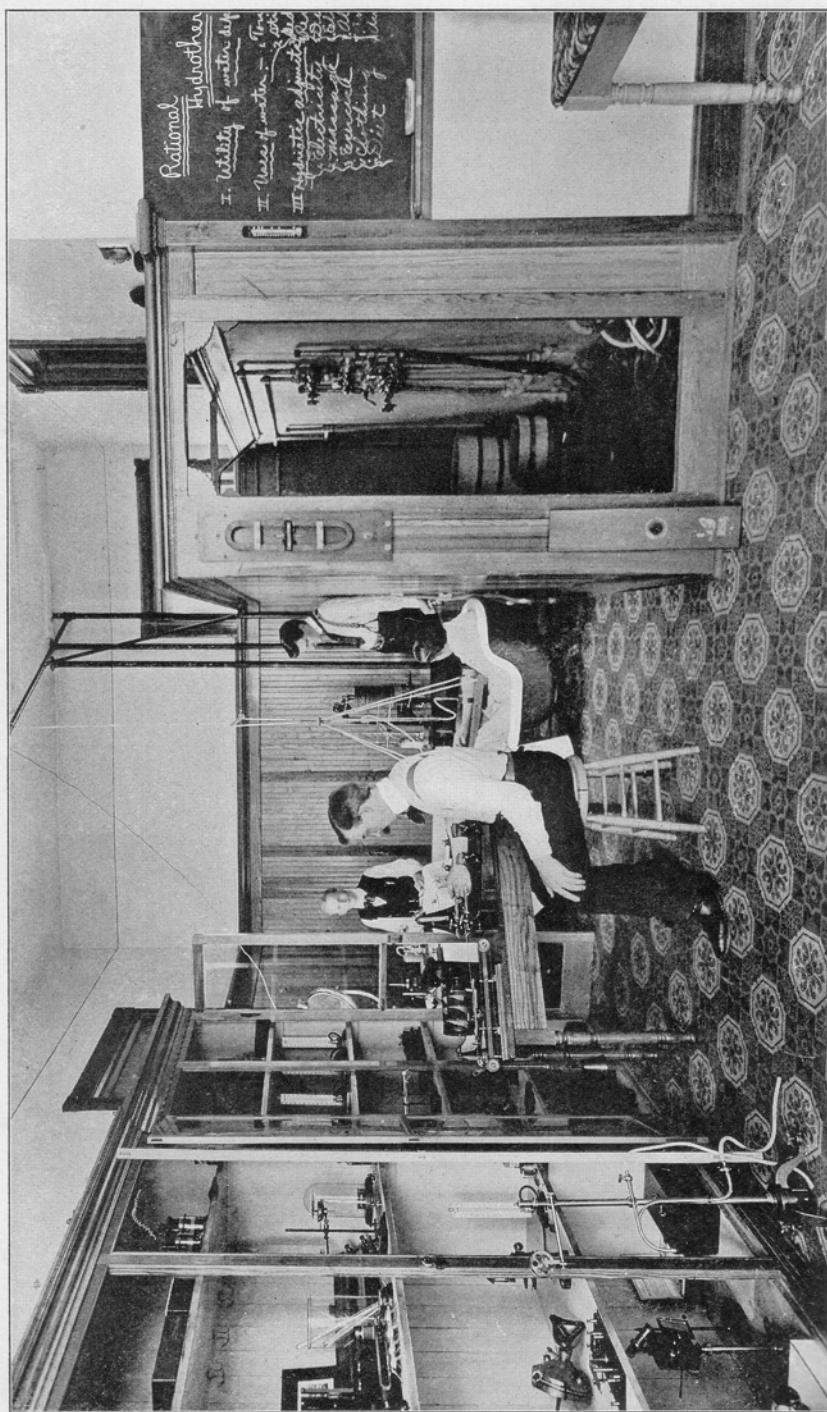


FIG. 248. A CORNER IN THE BATTLE CREEK SANITARIUM LABORATORY OF EXPERIMENTAL HYDROTHERAPY (p. 1107).

## A BRIEF SUMMARY OF EXPERIMENTAL WORK DONE IN THE HYDRIATIC LABORATORY OF THE BATTLE CREEK SANITARIUM.

THE first experimental work done by the author in the study of scientific hydrotherapy was begun in the summer of 1875. During the twenty-six years which have since elapsed, experimental inquiries of various sorts have been carried on almost constantly, and particularly during the last ten or twelve years. Within the last year an attempt has been made to review the entire field of physiological experiments upon which the fundamental principles of hydrotherapy rest. In this work a large share of the experimental work which has been done by others has been repeated, and a considerable number of new experiments have been devised. In the following pages the author presents the results of a few of the many hundreds of experiments made in the laboratory under his supervision. Most of the work has been done under the author's direction by one of his able assistants, Dr. Elmer F. Otis, aided by trained nurses and medical students. The faithful work of Messrs. Wolfson, Swartwout, Larson, Lemon, and Selmon, medical students, entitles them to mention among the many who have contributed excellent service in various capacities in prosecuting the extensive and laborious studies briefly presented in this summary, which have involved an amount of painstaking effort which can be appreciated only by those who have engaged in similar work.

The purpose of presenting the results of these laboratory studies is to place before the profession some of the tangible facts that constitute the data upon which the foundations of scientific hydrotherapy are laid, and which constitute this the most thoroughly rational of all branches of therapeutics.

EXPERIMENT I.—*Showing the increase of heat production resulting from vigorous exercise (page 81).*

(a) R. A. S., a young man aged 21, weight 140 lbs., rode twenty-two miles upon a bicycle in two hours over an ordinary country

road. The rectal temperature on starting was  $98.9^{\circ}$ . At the close of the ride the rectal temperature was  $103.3^{\circ}$ ; increase,  $4.4^{\circ}$ . The patient perspired very freely, showing increase of elimination; but notwithstanding, the increase in heat production was sufficient to cause an accumulation of heat amounting to 554.4 heat units ( $140 \times 4.4 \times .9 = 554.4$ ).

(b) F. W. W., aged 25, weight 160 lbs., Sept. 30, 1900, ran four miles in forty minutes. The rectal temperature on starting was  $98.8^{\circ}$ ; at the end of the course, it was  $102.2^{\circ}$ ; increase,  $3.42^{\circ}$ , indicating an increase in the rate of heat production sufficient to store in the body, notwithstanding increased heat elimination, heat amounting to 490 heat units ( $160 \times 3.4 \times .9 = 489.6$ ).

(c) L. H. W., a young man aged 30, weight 150 lbs., Oct. 4, 1900, swam for twenty-five minutes in water at  $70^{\circ}$ . The rectal temperature on entering the water was  $99^{\circ}$ ; immediately on coming out of the water, it was found to be  $100.2^{\circ}$ ; increase,  $1.2^{\circ}$ . In this case a considerable amount of heat was without doubt absorbed by the water, so that the actual increase in heat production is not shown by the increase in temperature; nevertheless the amount of heat accumulated was considerable, amounting to not less than 162 heat units ( $150 \times 1.2 \times .9 = 162$ ).

EXPERIMENT 2.—*Showing that heat production is increased by cold applications of brief duration (page 82).*

L. H. W., a young man aged 30, weight 166 lbs., received a percussion douche for thirty seconds, followed immediately by moderate exercise. The rectal temperature before the application was  $99^{\circ}$ ; immediately afterward,  $99.6^{\circ}$ , an increase of  $.6^{\circ}$ . The elevation of temperature was maintained for forty-five minutes. This observation has been repeated upon many subjects with similar results. The reaction following a short cold application results in increased heat elimination; notwithstanding, heat accumulation occurred in this case to the extent of 90 heat units ( $166 \times .6 \times .9 = 89.6$ ). During the first moments following a short cold bath there is an elevation of temperature from diminished heat elimination.

EXPERIMENT 3.—*Showing the method of determining the rate of heat elimination by means of the bath-tub calorimeter (page 87).*

This method was first used by Liebermeister more than a score of years ago. It was independently devised and utilized by the author in 1892.

Four hundred pounds of water at a temperature of  $68.4^{\circ}$  was placed in an ordinary bath tub, the temperature of the room being  $71.5^{\circ}$ . Under these conditions the temperature of the water remained practically stationary. A young man, F. W. W., aged 25, weight 160 lbs., with a rectal temperature of  $98.8^{\circ}$ , was immersed in the water. At the end of fifteen minutes the temperature of the water was found to have risen  $1.5^{\circ}$ ; the subject's temperature had also risen  $.2^{\circ}$ . By simple calculation, it appears that the water had absorbed 600 heat units from the subject ( $400 \times 1.5 = 600$ ), while his temperature had not only not fallen, but was actually slightly raised. The ordinary rate of heat production and elimination is about 7.2 heat units per minute. Under the conditions above named, the loss was 40 heat units per minute without lowering of the body temperature, showing an increase of heat production amounting to more than five and a half times the ordinary rate ( $40 \div 7.2 = 5.55$ ).

EXPERIMENT 4.—(Page 87.)

The conditions being the same as in the preceding experiment, the subject, E. F. O., a young man aged 26, weight 105 lbs., temperature  $98.4^{\circ}$ , was immersed in the bath for five minutes. At the close of the experiment the body temperature was found to be  $98.6^{\circ}$ . The temperature of the water was raised  $.4^{\circ}$ , amounting to 160 heat units, sufficient to reduce the temperature of the patient, if heat production had been suspended,  $1.5^{\circ}$  ( $160 \div 105 = 1.5$ ). The normal rate of heat elimination for a patient weighing 105 lbs. would be about 30 heat units in five minutes. In the calorimeter, the amount eliminated was 160 heat units, or more than five times the normal amount.

EXPERIMENT 5.—(Page 87.)

(a) The subject, A. W. P., a young man aged 27 years, weight 165 lbs., was placed in the bath calorimeter with water at a temperature of  $75.3^{\circ}$ . At the end of five minutes it was found that the temperature of the water had risen to  $76^{\circ}$ , an increase of .7 of a degree, indicating that the body had given off 280 heat units.

The body temperature had also fallen from  $98.4^{\circ}$  to  $98^{\circ}$ , representing a loss of 59 heat units. Subtracting 59 from 280 we have 221 heat units, representing the amount of heat actually produced by the body during the five minutes. At the ordinary rate, the amount of heat produced during this period would be about 37.5 heat units. There was hence an increase in heat production amounting to 183.5 heat units, and heat production was excited to the extent of about five times the ordinary rate ( $221 - 37.5 = 183.5 \div 37.5 = 4.89$ ).

(b) The young man was then given a hot shower bath for ten minutes, at which time the body temperature was found to be  $99^{\circ}$ . He was then placed in the calorimeter with the water at  $76^{\circ}$ . At the end of five minutes the temperature of the water was raised to  $77.1^{\circ}$ , while the patient's temperature had fallen to  $98^{\circ}$ , indicating a loss of 440 heat units.

(c) On removal from the bath, the patient was wrapped in blankets, and allowed to remain covered until warm, when he was returned to the calorimeter with the water at a temperature of  $77.5^{\circ}$ . At the end of five minutes the temperature of the water had risen  $.3^{\circ}$ , showing a loss of heat communicated by the subject to the water amounting to 120 heat units.

(d) T. J., a young man aged 23, weight 160 lbs, in the second week of typhoid fever. The mouth temperature was  $104.4^{\circ}$ ; rectal  $104.8^{\circ}$ . The patient was immersed in the bath-tub calorimeter containing 400 pounds of water at  $70.2^{\circ}$ , with room temperature at  $63^{\circ}$ . He remained in the calorimeter five minutes, during which time surface friction was kept up constantly. At the end of the experiment, the patient's temperature by mouth was  $101.2^{\circ}$ , by rectum,  $102^{\circ}$ . The temperature of the water had risen to  $72.1^{\circ}$ . As previously noted, the temperature of the water was cooling by evaporation at the rate of  $.2^{\circ}$  every five minutes.

From the above it appears that the water of the bath absorbed in five minutes 680 heat units ( $72.1 - 70.2 - .2 = 1.7 \times 400 = 680$ ). Of this amount, 403.2 heat units is accounted for in the lowering of body temperature ( $104.8^{\circ} - 102^{\circ} = 2.8^{\circ} \times 160 \times .9^* = 403.2$ ). There was thus a temporary increase of heat production during the bath, amounting to 7.4 times the normal, while heat elimination

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\* The specific heat of the body is .9 that of water.



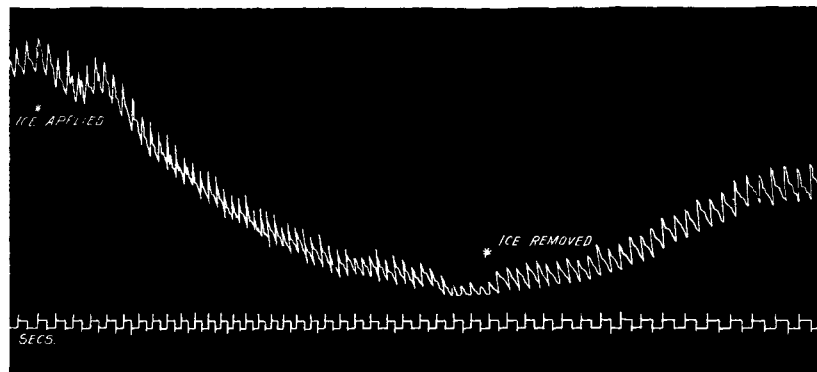


Fig. 249 (Exp. 16). Plethysmographic Tracing Showing Shrinkage of Blood-vessels in Hand Produced by Ice Applied to Opposite Hand (p. 1114).  
Before. After.

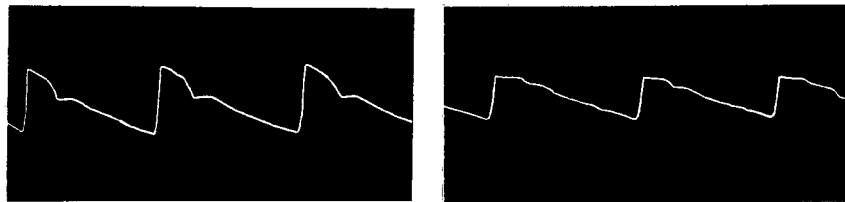


Fig. 250 (Exp. 17). Sphygmographic Tracing Showing Contraction of Vessels of Arm Produced by Applications of Ice to Axilla (p. 1114).

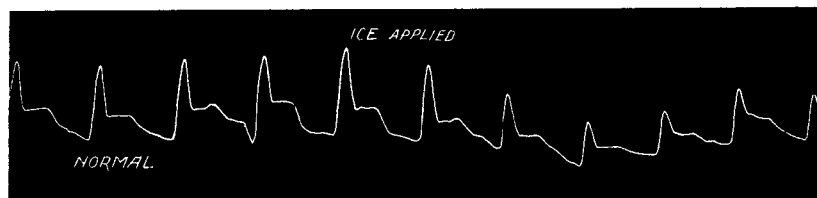


Fig. 251 (Exp. 18). Sphygmographic Tracing of Radial Pulse Showing Contraction of the vessels of the Forearm Resulting from Application of Ice to Bend of Elbow (p. 1114).

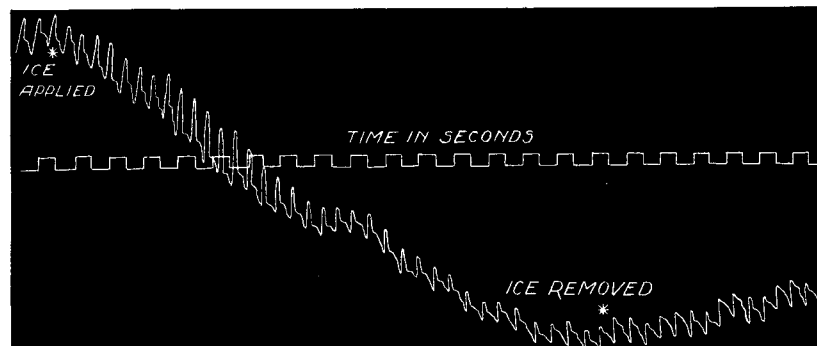


Fig. 252 (Exp. 19). Plethysmographic Tracing Showing Diminution in the Volume of the Forearm Resulting from Application of Ice to Elbow (p. 1114).

was increased to 18 times the normal rate. Heat elimination was thus increased in a febrile case nearly two and a half times as much as heat production. The heat elimination was increased 2.4 times as much as in a normal subject (Exp. 5 (a)), while heat production was increased only 25 per cent. This explains the great value of the cold rubbing bath as a means of reducing temperature in fever.

EXPERIMENT 6.—*Observations respecting the influence of various procedures upon heat elimination by means of d'Arsonval's calorimeter (Fig. 24, page 89).*

(a) The subject, L. H. W., a young man aged 30, weight 166 lbs., was placed in calorimeter such as is shown in Fig. 24, page 89, with his clothing removed, in a room at a temperature of 70°. The rate of air movement as shown by the anemometer, was 123 feet per minute.

(b) The same subject was placed in an electric-light bath for sufficient time to redden the skin, but not to produce perspiration, and then placed in the calorimeter. The rate of air movement was found to be 140 feet per minute.

(c) The same subject was given an electric-light bath to the extent of producing profuse perspiration. He was then placed in the calorimeter, and the rate of air movement was found to be 170 feet per minute, showing a very considerable increase in the rate of heat elimination due to elevation of the temperature of the skin.

(d) The same subject was given a cold percussion douche for two minutes (temperature of the water 60° F.). When placed in the calorimeter, the rate of air movement was found to be 70 feet per minute. In ten minutes, when reaction had taken place, the rate was found to be 110 feet per minute.

EXPERIMENT 7.—(Page 89.)

(a) The subject, R. A. S., a young man aged 21, weight 140 lbs., was placed in the calorimeter in a room at 86°. The rate of air movement, as shown by the anemometer, was found to be 70 feet per minute. After the administration of a cold wet-sheet rub, the rate of movement was found to be 97 feet per minute. Seven minutes later, when reaction had taken place, the rate of movement had increased to 110 feet per minute.

(b) After a very cold percussion douche (56°) the rate of movement was found to be reduced to 92 feet per minute.

(c) The same subject was placed in a wet-sheet pack, and removed at the beginning of the heating stage. When placed in the calorimeter, the rate of air movement was found to be 98 feet per minute.

(d) After a hot blanket pack and while perspiring freely, the same subject produced an air movement of 122 feet per minute.

(e) The subject was made to exercise moderately until general perspiration was induced. He was then placed in the calorimeter with the result of producing an air movement of 90 feet per minute. The difference between the results in this experiment and in (c) was doubtless due to the fact that in the latter the temperature of the skin was raised by the prevention of heat elimination, while in the former there was increase of heat elimination, with increase in heat production.

EXPERIMENT 8.—*Showing the effects of partial cold applications in lowering the surface temperature (page 104).*

The subject was a young man aged 26, weight 153 lbs. The temperature of the hand, as obtained in the palm with the hand closed, was 98.4°. The hand was immersed in water at 40° for one minute, then removed and lightly dried, when the temperature was found to be 90°. The temperature rose to 95° in five minutes, and to 97.8° in ten minutes. Only at the end of fifteen minutes was the initial temperature reached.

EXPERIMENT 9.—*Comparison of the reaction produced by percussion and friction with that of the heating compress (page 105).*

A heating compress was applied to the upper arm of a healthy young man for twenty minutes. The compress consisted of a linen cloth wrung as dry as possible out of ice-cold water, wrapped about the arm, and covered with several layers of flannel tightly applied. Immediately afterward, percussion and friction movements were begun upon the arm of the opposite side, and continued during the whole period of twenty minutes. At the end of this time, the pack was removed. On comparison, it was found that the degree of redness of the skin on the two arms was practically equal.

EXPERIMENT 10.—*Showing the influence of cold upon perspiration (page 105).*

The electric-light bath was applied to the leg of a young man for fifteen minutes until profuse perspiration of the limb was produced. Water at 60° was then dashed upon the leg, with the result that perspiratory activity was instantly suspended.

EXPERIMENT 11.—*(Page 106.)*

The subject, M. M. M., was a young man aged 35. By means of an asthesiometer the normal tactile sensibility of the subject was found to be such as to enable him to recognize the two points of the asthesiometer when separated 2 mm. After immersion for five minutes in water at 60°, it was necessary to separate the points 3.5 mm. to enable the subject to distinguish them. Five minutes' immersion at 40° increased the distance to 6 mm.

EXPERIMENT 12.—*Showing the effect of short cold applications upon cardiac activity (page 107).*

(a) The subject, R. R. H., was a young man aged 21 years, weight 115 lbs., pulse 74. Gently slapping the chest over the heart with the end of a towel wrung out of cold water, half a dozen times, raised the pulse rate to 86.

(b) In another subject with normal pulse (66), the cold percussion douche at 65° increased the pulse rate to 86.

EXPERIMENT 13.—*Showing the increase of arterial tension resulting from cold applications of short duration (page 107).*

The subject, R. A. S., a young man aged 21, weight 140 lbs., presented a normal pulse rate of 81, with a tension, as shown by Gærtner's tonometer (Figs. 239, 240, page 931), of 9.5 cm. of mercury. Upon the application of a douche at 55°, the pulse rate was immediately increased to 90, and the tension to 10 cm.

EXPERIMENT 14.—*Showing the effect of prolonged cold applications in slowing the heart (page 107).*

(a) The subject, a man aged 40, weight 140 lbs., pulse rate 76, was in water at 55° for ten minutes, when the pulse rate was found to be reduced to 50°. The tension was decidedly increased.

EXPERIMENT 15.—(*Page 107.*)

(*b*) The subject, E. F. O., a young man aged 26, weight 105 lbs., pulse 74, was placed in a shallow bath at 70° for three minutes. The pulse rate at the close of the bath was 60, with tension greatly increased. This observation was made by the author's colleague, Dr. W. H. Riley, in August, 1895.

EXPERIMENT 16.—*Showing that ice held in one hand produces a contraction of the blood-vessels of the opposite hand (page 108).*

The subject was a young man of 35 years, weight 172 lbs. One arm was placed in the glass cylinder of a plethysmograph. A piece of ice was placed in the opposite hand, with the result shown in the accompanying graphic, which is a photo reproduction of the original (Fig. 249).

EXPERIMENT 17.—*Showing that the application of ice to the axilla causes contraction of the arteries of the arm (page 108).*

The subject was a young man aged 27, weight 165 lbs. The accompanying tracing was obtained by means of Dudgeon's sphygmograph (Fig. 4, page 60) immediately before and after the application of ice to the axilla (Fig. 250 *a* and *b*.)

EXPERIMENT 18.—*Showing the effect of the application of ice to the bend of the elbow in diminishing the weight of the up stroke in sphygmographic tracings obtained from the radial pulse (page 108).*

The subject was a young man aged 26, weight 105 lbs. By Marey's sphygmograph the accompanying graphic was obtained, showing the normal tracing and the effect produced by the application of ice to the bend of the elbow (Fig. 251).

EXPERIMENT 19.—*Showing by means of the phthysmograph the effect of the application of ice to the bend of the elbow in diminishing the capacity of the blood-vessels of the hand and forearm (Fig. 252, page 109).*EXPERIMENT 20.—*Showing the effect upon the pulse rate of a prolonged cold immersion with friction.*

The subject, J. T. M., a vigorous young man of 32 years, weight 170 lbs., with normal pulse rate of 80, was placed in a cold immer-

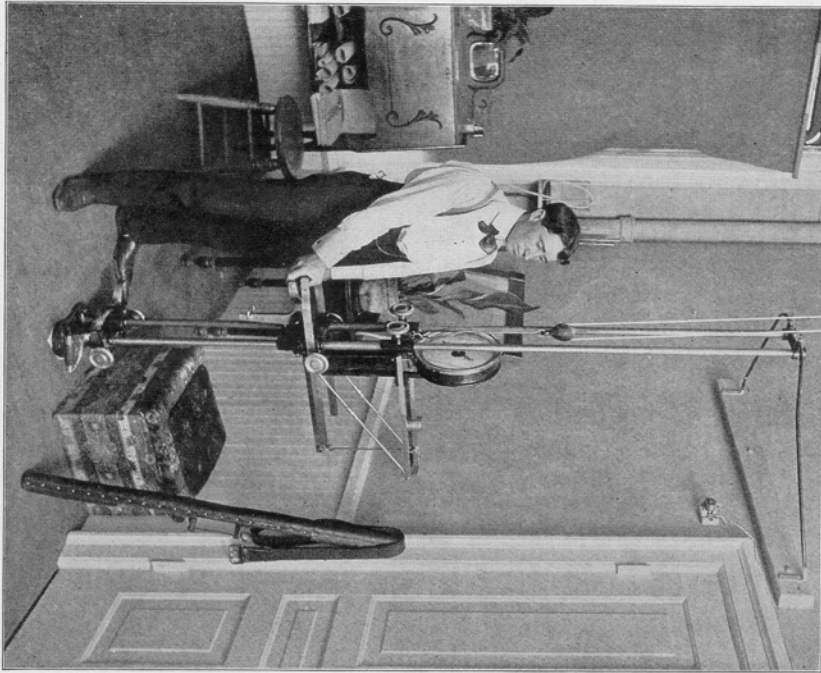


FIG. 253 (Exp. 44). UNIVERSAL DYNAMOMETER (p. 1122).  
(Kellogg)

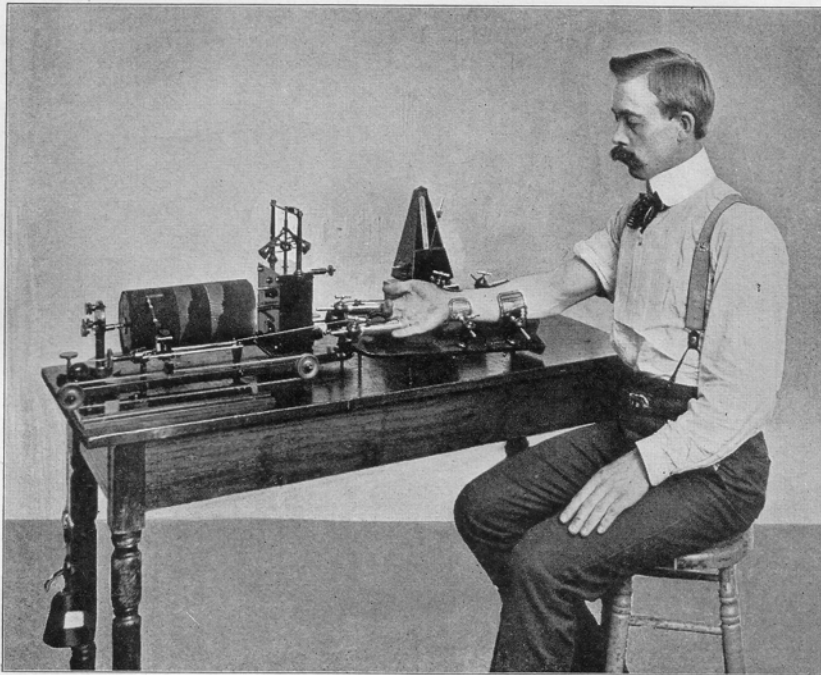


FIG. 255. MOSSO'S ERGOGRAPH (p. 1123).

sion bath at 45° for twenty minutes, friction being applied at the same time. At the end of the experiment the patient's pulse was 58.

EXPERIMENT 21.—*Showing the effect of cold beverages upon the pulse rate and tension (page 109).*

The subject, A. E. L., was a young man aged 26 years, weight 165 lbs., a normal pulse of 66, blood pressure 13.5 cm. as determined by Gærtner's tonometer. Five glassfuls of weak lemonade at 50° were swallowed quickly. Examination of the pulse, made almost immediately after, showed it to be slowed to 52, while the arterial tension, as indicated by the tonometer, was 14.5 cm.

EXPERIMENT 22.—*Showing the effect of the cold enema in lowering the body temperature (page 110).*

(a) For the purpose of determining the effect of a cold enema on the normal subject, water at 70° was passed in and out the colon continuously for forty-five minutes, the subject being a young man of 21 years, weight 140 lbs. The mouth temperature rose from 97.8° to 98° during the application. Forty-five minutes after the conclusion of the experiment, the rectal temperature was 94°, and at the end of one hour and a quarter 98.1°, still nearly 2° F. below the normal rectal temperature.

(b) The subject, M. G., a young man aged 22, suffering from typhoid fever, first week presented a temperature of 104.2°. Three large enemas were administered in rapid succession, the temperature being 66°, 62°, 62°. The result was a reduction of the body temperature within one hour to 99.2°. So marked a result as this is not always obtainable, but temperature reduction is decided whenever this measure is faithfully employed.

EXPERIMENT 23.—*Showing the effect of the application of the cold douche to the chest in increasing the depth of the respiratory movements (page 110).*

The accompanying tracing was made by the author's pneo-graph (see Figs. 25, 26, p. 110). The increased amplitude of the respiratory movements continued for fully one minute. When the cold application is general, the amplitude is still more decided, and continues or a longer time (see Fig. 26, p. 110).

EXPERIMENT 24.—*Showing the restorative effects of the cold douche (page 112).*

M. J. N., a man of 21 years, weight 136 lbs., rode, Aug. 26, 1900, 35 miles on a bicycle within two and a half hours, at the end of which time he was very much-fatigued, not being accustomed to long riding. The muscular capacity of the subject, as shown by the author's dynamometer (Fig. 253), was 6,870 lbs. At the conclusion of the ride, the dynamometer showed reduction of nearly 1,000 foot pounds, or 5,955 lbs. A cold (55°) percussion douche was administered for thirty seconds, having been preceded by a hot shower for thirty seconds. A second test with the dynamometer was then made, and the total strength was found to be increased to 6,555 lbs., a gain of 600 lbs. The sensation of freshness and vigor experienced by the subject as the result of the cold douche was so marked that he expressed himself as being quite relieved from any sense of exhaustion.

EXPERIMENT 25.—*Showing diminution of the rate of transmission of impressions over a nerve trunk as the result of a cold application made along the course of the nerve (pages 110, 114).*

In the subject selected, the rate of time required for the patient to make a signal after an impression made upon the finger was .11 seconds. After the elbow of the same arm had been packed in ice for five minutes, the time required was .22 seconds.

EXPERIMENT 26.—*Showing the local increase in the blood count resulting from a cold application (pages 110, 121).*

To the subject, W. E. P., a medical student, a short, hot abdominal fomentation was applied, followed by a snow compress at 40° applied to the abdomen for twenty minutes. The blood count made before and after the application gave the following results: Before, 4,450,000 red blood cells, 4,900 white corpuscles; after, 4,950,000 red cells, and 10,100 white cells. The hemoglobin was 96 per cent before and 99 per cent after the application. Examination made fifteen minutes later showed the blood count to be practically the same as before the application.



EXPERIMENT 27.—*Showing the effect of the cold epigastric douche, or the ice-bag applied to the epigastrium, in increasing the amount of hydrochloric acid in the gastric secretion (page 122).*

The subject, L. H. W., was a vigorous young man aged 30, weight 166 lbs. A careful examination of the stomach fluid drawn at the end of an hour after an Ewald test meal, showed the total calculated acidity to be .150, free hydrochloric acid .126.

A second test meal was given after the application of a cold percussion douche to the epigastrium and the spine opposite at 55° for two minutes. The chemical examination showed the calculated acidity to be .286, and free hydrochloric acid .156. An increase in the calculated acidity of 90 per cent, and in the amount of free hydrochloric acid of 24 per cent.

EXPERIMENT 28.—*Showing the influence of thermic applications upon heat production and heat loss\* (page 123).*

The subject, F. W. W., a young man aged 25, weight 160 lbs., was placed in a bath-tub calorimeter containing 400 pounds of water at a temperature of 68.4°. At the end of five minutes the temperature of the water was raised .7 of a degree, representing a heat loss by the subject amounting to 280 heat units. The body temperature during the application fell .8 of a degree, representing 115.2 heat units ( $160 \times .8 \times .9 = 115.2$ ), leaving 164.8 heat units resulting from heat production during the time covered by the experiment.

EXPERIMENT 29.—*Showing the effect of a hot spray in lessening heat production (page 123).*

The subject, A. W. P., aged 27, weight 165 lbs., was placed in a bath-tub calorimeter at 77.5°, after taking a spray bath at 106°. At the end of five minutes, the temperature of the bath had risen .3°, showing the absorption of 120 heat units ( $400 \times .3 = 120$ ). The rectal temperature showed a drop of .6 during the application, amounting to 99 heat units. Subtracting 99 from 120 leaves 21 heat units, representing the amount of heat actually produced during the five minutes. The normal amount of heat produced during this time should be, for a man weighing 165 pounds, at the rate of about 7.5 heat units per minute, or 37.5 heat units for the

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\*For the method of employing the bath-tub calorimeter, see page 87.

five minutes, from which it appears that there was a lowering of the heat production amounting to 16.5 heat units in five minutes, presumably as the result of the short hot spray, the natural effect of which is to diminish heat production by reflex influence upon the thermic centers.

EXPERIMENT 30.—(*Page 126.*)

(a) The subject, S. R. A., a young man aged 26, weighing 128 lbs., was first placed in a bath-tub calorimeter with water at a temperature of 82.4°. The temperature of the water was raised .18° in five minutes. The patient's temperature at the beginning of the bath was 98.6°, at the end 98.3°. From this data it appears that 400 pounds of water absorbed from the subject 72 heat units, of which amount 34.2 is accounted for by the fall of the body temperature, and 37.8 heat units were produced during the five minutes, an amount of heat practically the same as that normally produced within the time named.

(b) Later the same subject was placed in a bath at 77°, being rubbed during the entire period of five minutes, at the end of which time the temperature of the bath was found to be raised .54. The subject's temperature had in the meantime fallen .1 of a degree (from 98.8° to 98.7°). Of the heat absorbed by the water, 216 heat units, 11.5 heat units were accounted for by the fall of body temperature, leaving 204 heat units to be accounted for by increased heat production, about six times the amount that would have been developed if heat production had continued at the normal rate. The great increase of heat loss shown as the result of friction, in this case amounting to nearly 300 per cent, was without doubt due to the fact that there was very marked constriction of the surface vessels during the first immersion (Exp. 29), with goose-flesh appearance, whereby the heat elimination was interfered with to an unusual degree.

EXPERIMENT 31.—*Showing the effect of the application of the cold proximal compress to the arm (page 128).*

The subject, R. R. H., was made to immerse his elbow in a bath at 50°. The temperature of the hand at the beginning of the experiment was 90.5. After two minutes, the temperature of the hand was 87°. The temperature still remained below normal twenty minutes after removing the arm from the bath.

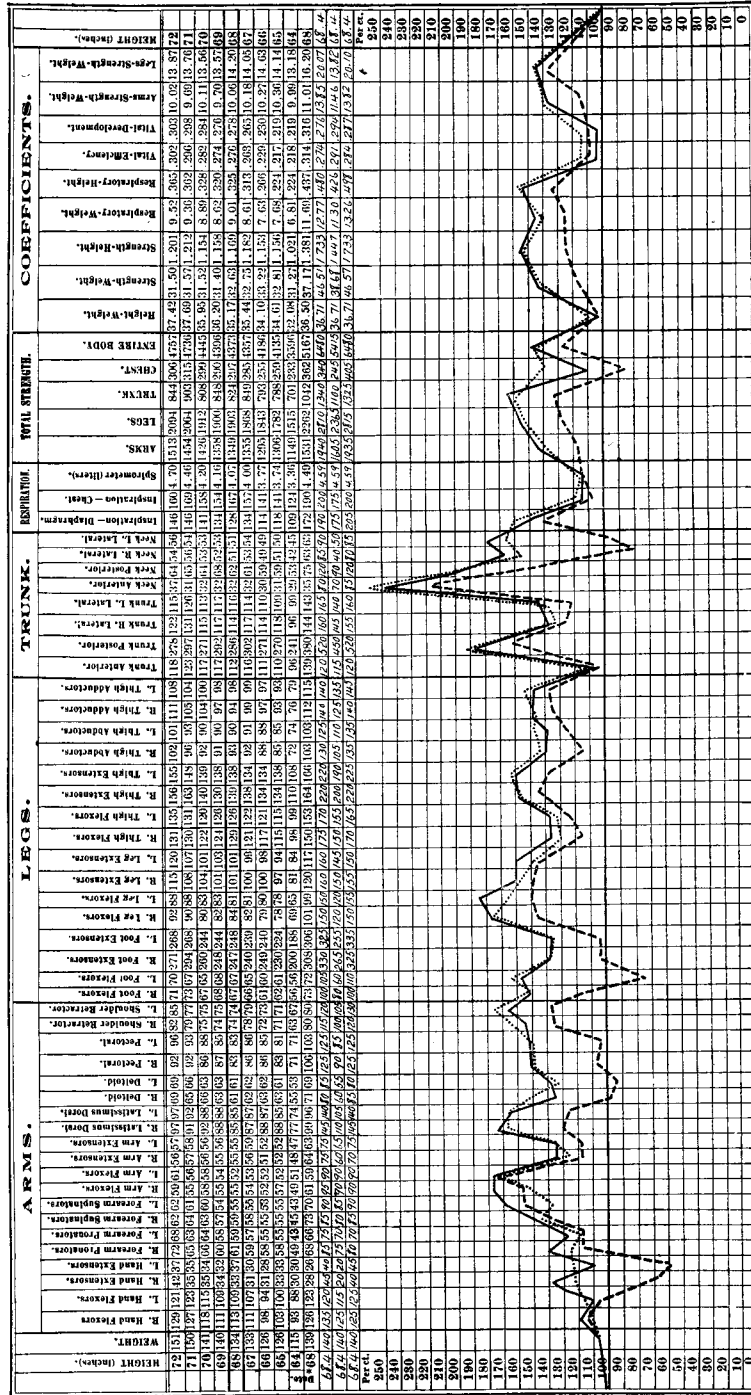


FIG. 254. PHYSICAL CHART SHOWING THE EFFECT OF A GENERAL HOT BATH IN DIMINISHING MUSCULAR CAPACITY (p. 1123).

EXPERIMENT 32.—*Showing the effect of cold water in the stomach upon the temperature of the overlying skin (page 128).*

The subject, R. A. S., a healthy young man, was made to take seven glasses of water at 55°. The surface temperature at the epigastrium, taken before the water was swallowed, was found to be 97.6°; after, 95.1°, a loss of 2.5° (see Exps. 64, 65, and 73).

EXPERIMENT 33.—*Showing the influence upon the general temperature and the circulation of the ice-bag applied over the heart (page 128).*

The subject, A. C. S., having a normal pulse of 80, and a tonometer reading (Gærtner) of 10 cm. of mercury, with mouth temperature of 99°, was placed in a reclining position, and an ice-bag applied over the heart. After three minutes, the pulse was found to be 72 and the tonometer reading was raised to 12 cm. At the end of one hour, the mouth temperature was found to be 98.5°. The rectal temperature was lowered one degree (from 100° to 99°).

EXPERIMENT 34.—*Showing the effect of copious water drinking and large cold enemas, in lowering the general temperature (page 128).*

(a) The subject, A. C. S., was a young man of 23 years, weight 137 lbs. His mouth temperature was 98°; rectum, 100°. Copious enemas at 70° were administered at intervals of twenty-five minutes for an hour and a half. The mouth temperature was then found to be 96.9°, and the rectal 95.2°.

(b) The subject, A. J. M., was made to drink seven glasses of weak lemonade at 59° F. The rectal temperature was reduced from 100° to 98.7°. The surface temperature at the epigastrium was reduced from 94° to 92°.

EXPERIMENT 35.—*Showing that friction accompanying partial cold immersion favors reaction (page 133).*

The subject placed his hand in water at 40°F. for one minute. Before immersion, the surface temperature of the hand taken in the palm with the hand closed, was 98.4°. After removing the hand and wiping it, the temperature was found to be 90°. In a room at 70° the normal temperature was regained at the end of fifteen minutes.

Repeating the same experiment under the same conditions, with the exception that the hand was rubbed vigorously during immersion in the water, the normal temperature was regained at the end of ten minutes.

EXPERIMENT 36.—*Showing that percussion accompanying a cold application favors reaction (page 134).*

(a) The subject, A. C. S., aged 23, weight 137 lbs., was immersed in a bath at  $56^{\circ}$  for 40 seconds, then gently dried and wrapped in a woolen blanket. The initial temperature of the surface was  $97.6^{\circ}$ . Immediately following the bath the surface temperature was found to be  $94.1^{\circ}$ . At the end of thirty minutes the temperature of the skin had become the same as before the immersion.

(b) To the same subject was administered a percussion douche at a temperature of  $50^{\circ}$ , pressure 35 lbs., duration 40 seconds. The initial temperature was  $97.6^{\circ}$ . After the douche, the skin temperature was found to be  $94.6^{\circ}$ . The initial temperature was recovered at the end of ten minutes.

(c) In an experiment with the same subject under like conditions, the ordinary jet douche with pressure of 35 lbs. was followed by complete reaction with return of normal surface temperature, in twelve minutes.

EXPERIMENT 37.—*Showing the advantage of friction in connection with general cold immersion in promoting reaction (page 134).*

(a) The subject, A. C. S., a young man aged 23, weight 137 lbs., was placed in an immersion bath at  $56^{\circ}$  for forty seconds. The initial surface temperature (abdomen) was  $98.1^{\circ}$ ; immediately following the bath,  $96.1^{\circ}$ . The initial temperature was regained at the end of twenty-seven minutes.

(b) The same subject was immersed in a bath at  $56^{\circ}$  for 40 seconds with vigorous friction during the bath. The initial surface temperature was  $97.6^{\circ}$ . Immediately after the bath the surface temperature was  $94.1^{\circ}$ . The initial temperature was regained in eighteen minutes.

(c) A wet-sheet rub was administered to the same subject, the sheet being wrung from water at  $40^{\circ}$ . The initial temperature was  $97.6^{\circ}$ ; immediately following the bath,  $96.1^{\circ}$ . The initial temperature was regained at the end of five minutes.

EXPERIMENT 38.—*Showing the influence of exercise upon reaction*  
(page 134).

(a) A cold bath at 55°, duration 20 minutes, with friction, was administered to J. T. M., a young man aged 32, weight 170 lbs. Full reaction, as indicated by a return of the surface temperature to the initial point, was complete only at the end of four hours, the patient in the meantime remaining quiet. The subject was cold and shivered considerably for some time after the bath.

(b) The same procedure, in the same subject, with identical conditions, but followed by moderately vigorous exercise, secured complete reaction in fifteen minutes.

EXPERIMENT 39.—(Page 139.)

The subject, H. R. P., placed his hand in water at 50° for one minute. The initial temperature taken with the closed palm was 97°. Immediately after the immersion it was found to be 90°. The normal temperature was regained in nine minutes.

EXPERIMENT 40.—*Showing the effect of heat and cold upon the surface circulation* (page 143).

(a) The subject, L. S., was a young woman aged 23, just convalescing from typhoid. The blood pressure, as determined for the middle finger of each hand by Gærtner's tonometer (Figs. 239, 240, page 931), indicated a pressure of 7 cm. mercury. The two hands were immersed, the right hand in ice-water, the left hand in hot water, for five minutes, at the end of which time the tension was found to be, for the right hand, 5.5 cm.; for the left, 9 cm., a difference of 3.5 cm.

(b) The same experiment made in healthy subjects showed a difference of about 1 cm. of mercury.

This experiment very clearly shows the influence of cold in contracting the surface vessels, and of heat in dilating the vessels and exciting the surface circulation.

EXPERIMENT 41.—*Showing the influence of heat upon the tactile sensibility* (page 145).

The subject, A. C. S., was a young man aged 23, weight 137 lbs. The two points of the asthesiometer were distinctly felt upon the back of the hand at a distance of 20 mm. After immersion in

water at 117° for four and a half minutes, the two points were distinct only at 30 mm. Temperatures of 98° to 95° produced no effect.

EXPERIMENT 42.—*Showing the effect of general hot applications upon the blood pressure and pulse rate (page 147).*

The subject, R. R. H., was a young man aged 21, weight 115 lbs. Before the experiment, with the subject reclining, the pulse was 92, radial tension 9 cm., as determined by Gærtner's tonometer (Figs. 239, 240, page 931). The couch, the subject lying upon it, was pushed into an electric-light cabinet without any exertion on his part. Within a minute the radial pulse fell to 54, and the tonometer showed a rise of pressure in the peripheral vessels to 10 cm. At the end of five minutes, the subject was perspiring moderately. The pulse was then found to be 66, the tonometer reading 8 cm. At the end of 20 minutes the pulse was 92, the tonometer reading 7 cm. The subject was then withdrawn from the cabinet. The pulse rate immediately fell to 86, but some time elapsed before the blood pressure rose to normal.

EXPERIMENT 43.—*Showing the effect of heat and cold upon the volume of the tidal air of respiration (page 149).*

(a) The subject, R. A. S., was a young man aged 21, weight 140 lbs. The normal amount of tidal air was determined to be 43 cubic inches. The patient was placed in an immersion bath at 108°. At the end of twelve minutes, the amount of tidal air was found to be 27 cubic inches. Ten minutes after the bath, the tidal air was 33 cubic inches; 30 minutes after, 37 cubic inches. This experiment shows a loss in the volume of the respired air amounting to 37.5 per cent.

(b) A wet-sheet rub at a temperature of 40° was administered to a young man, O. R. C., aged 25, weight 142 lbs. The initial volume of tidal air was 28 cubic inches. The volume of tidal air immediately after the treatment was 35 cubic inches, an increase of nearly 26 per cent.

(c) The subject, F. J. W., was a young man aged 25, weight 127 lbs. The initial volume of tidal air was 33 cubic inches. Cold mitten friction was administered at 45° for two minutes. Immediately after the application the tidal air was found to be 51 cubic inches, an increase of 55 per cent.

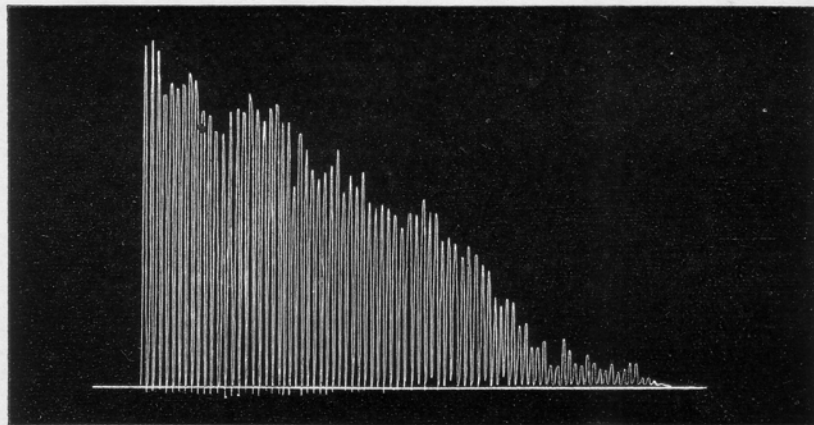


Fig. 256 (Exp. 45). Ergogram Obtained by Means of Mosso's Ergograph, Showing Normal Fatigue Curve of a Young Man, R. A. S. Total work, 4.994 kgm. (p. 1123).

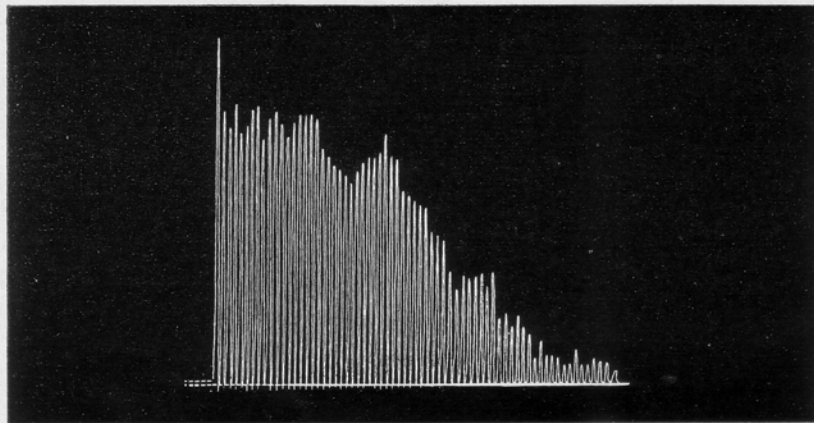


Fig. 257 (Exp. 45). Ergogram Showing Fatigue Curve of R. A. S. after a Spray at  $113^{\circ}$  for Fifteen Minutes. Total work, 4.432 kgm. (p. 1123).

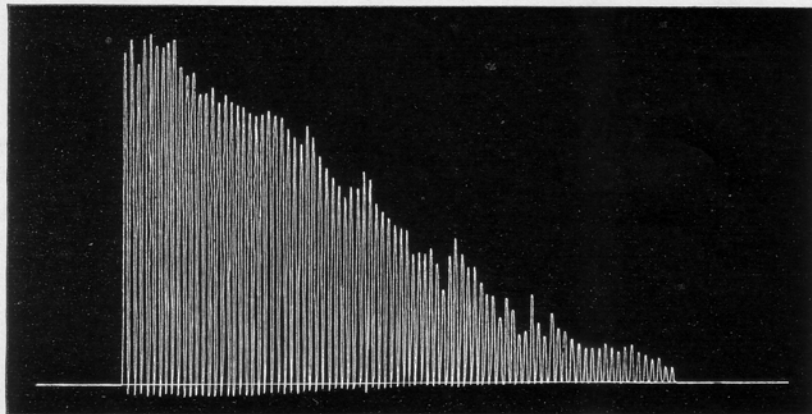


Fig. 258 (Exp. 45). Ergogram Showing Fatigue Curve of R. A. S. after a Cold Spray Following a Hot Bath. Total work, 6.094 kgm. (p. 1124).



(d) E. F. O., a young man aged 25, weight 105 lbs., was given a wet-sheet pack for one hour. The sheet was wrung as dry as possible, from water at 45°. The amount of tidal air before the application of the wet sheet was 27 cubic inches. Two minutes after the sheet was applied, the amount was 36 cubic inches, an increase of  $33\frac{1}{3}$  per cent; fifteen minutes later, 33 cubic inches. The amplitude of respiratory movement gradually lessened, until at the end of an hour, when the experiment terminated, the amount of tidal air was 28 cubic inches. The experiment thus showed an increase in the amount of air received into the lungs during the entire period, amounting to an average of 18.5 per cent. The subject was lightly covered to prevent excessive heat accumulation, thus maintaining the pack in the neutral stage.

EXPERIMENT 44.—*Showing the depressing effects of the general hot bath by its influence upon muscular capacity (page 150).*

The subject, W. P. L., was a young man of 21 years, weight 140 lbs. His total muscular strength, as shown by the Universal Dynamometer (see Fig. 253), was 6,480 lbs. (Fig. 254). The full immersion bath was administered at 112°, duration twelve minutes. At the conclusion of the bath, the strength was tested again, and found to be 5,415 pounds, a loss of 1,065 pounds, or more than 16 per cent. The subject felt very much weakened and depressed by the experiment, from which he was quickly recovered, however, by the application of a spray douche at 50° for thirty seconds. His strength was again tested, and found to be 6,480 pounds, or exactly the same as at the beginning of the experiment. This experiment also illustrates the marvelous properties of cold water as a restorative agent.

EXPERIMENT 45.—*Showing the effects upon muscular capacity of a cold bath following a hot immersion bath (page 151).*

(a) The subject, R. A. S., was a young man aged 21, weight 140 lbs. The strength of the flexor muscle of the middle finger of the right hand was determined by means of Mosso's ergograph (Fig. 255), and is shown in the accompanying graphic (Fig. 256). The total work was 5.290 kgm. A hot spray was administered at 113° for fifteen minutes. Another ergogram was obtained (Fig. 257), and the amount of work done was found to

be 5.235 kgm., showing a loss of .562 kgm., or 11 per cent. A cold spray was then administered at 60°, duration ten minutes, and the ergogram shown in Fig. 258 was obtained. The amount of work recorded was 6.094 kgm., an immediate increase of more than 16 per cent, and an increase of 15 per cent over the total work recorded at the beginning of the experiment.

(b) In a similar experiment with the same subject, in which the Universal Dynamometer was used as a means of determining the effects of the applications, the hot bath produced a loss of 915 pounds, or 13 per cent of the total strength, while the cold bath produced a gain of 1,267 pounds, or 18 per cent, the subject having a total muscular capacity at the end of the experiment 5 per cent greater than at the beginning.

EXPERIMENT 46.—*Showing the effects upon the body temperature of a general application of heat (page 158).*

(a) The subject, A. C. S., was a young man aged 23, weight 137 lbs. A Russian bath was administered at 115°, duration twenty-five minutes. The initial body temperature was, mouth, 98.6°; rectal, 99.9°. At the conclusion of the bath, the mouth temperature was 102.4° and the rectal temperature 102°, an increase of 258.9 heat units ( $137 \times 2.1 \times .9 = 258.9$ ).

(b) An electric-light bath was administered (1891) to a young man aged 22, weight 145 lbs. The subject's temperature was normal at the beginning of the experiment, and was raised by the bath in five and one-half minutes 1.6° F. (mouth). The surface temperature was elevated during the same period 2.3° F.

EXPERIMENT 47.—*Showing the effects of the hot immersion bath on the body temperature (page 158).*

The subject, W. E. P., was a young man aged 35, weight 120 lbs. He was placed in a full bath at 104° for thirty minutes. The initial body temperature was, mouth, 98.7°; rectal, 99.6°. At the end of the experiment, the mouth temperature was found to be 102.3°; and the rectal temperature, 102.8°, an increase of 3.2°, representing 345.6 heat units ( $120 \times 3.2 \times .9 = 345.6$ ). The amount of heat normally produced in thirty minutes would be 216 heat units ( $7.2 \times 30 = 216$ ). This leaves 129.7 heat units to be accounted for by absorption or increased heat production. Some

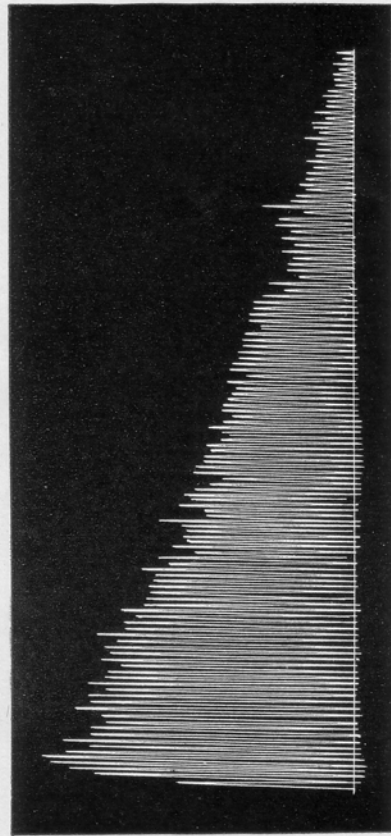


Fig. 259 (Exp. 50). Normal Fatigue Curve of A. E. L. Total work, 5.395 kgm. (p. 1125).

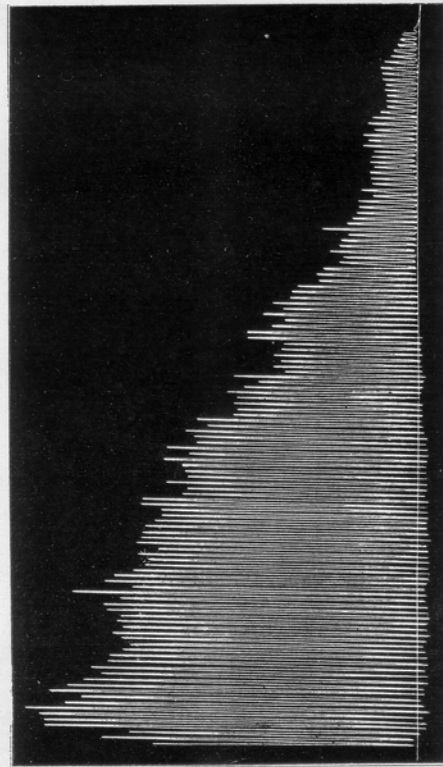


Fig. 269 (Exp. 56b). Normal Fatigue Curve of a Young Man, the Subject of the Experiment. Total work, 8.033 kgm. (p. 1128).

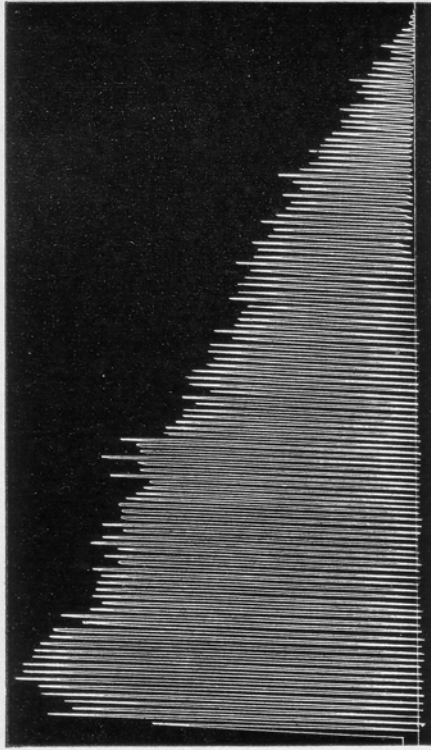


Fig. 260 (Exp. 50). Ergogram Showing Fatigue Curve of A. E. L. after Application to Forearm of a Douche at 60° for One Minute. Total work, 6.925 kgm. (p. 1125).

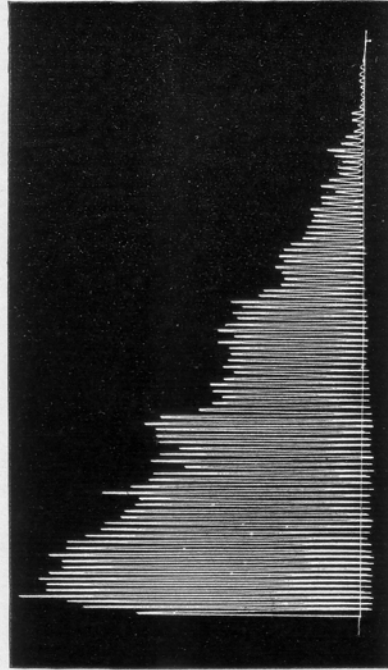


Fig. 270 (Exp. 56b). Fatigue Curve Obtained from the Same Subject after an Immersion Bath at 104° for Twenty Minutes. Total work, 4.459 kgm. (p. 1127).

heat was doubtless absorbed by the body during the bath, but it seems reasonable to believe that the great accumulation of heat was due to diminished heat elimination with increased heat production, rather than to the mere absorption of heat.

All general applications which interfere with heat elimination at the ordinary rate, produce similar results.

EXPERIMENT 48.—*Showing the effect on body temperature of a bath at the temperature of the body (page 159).*

The subject, W. E. P., was a man aged 35, weight 120 lbs. The body temperature determined just before the experiment was, mouth, 98.5°; rectal, 101.2°. The subject was placed in an immersion bath at 100° for one hour. The mouth temperature was then found to be 101.9°; the rectal, 101.8°.

EXPERIMENT 49.—*Showing the effect of dry friction upon the surface temperature (page 166).*

Friction with the dry shampoo brush was administered for thirty minutes to a subject, W. E. P., aged 35, weight 120 lbs. The surface temperature, taken at different parts of the body before and after the experiment, showed a gain of from 1.5° to 4°, an average of 2.7°.

EXPERIMENT 50.—*Showing the effects of a partial cold application in increasing muscular capacity (page 300).*

The subject, A. E. L., was a young man aged 26 years, weight 151 lbs. His normal ergogram is shown in Fig. 259. The total work recorded was 5.395 kgm. After the application to the forearm for one minute, of a douche at 60°, the ergogram shown in Fig. 260 was obtained, and the total work recorded was 6.925 kgm., an increase of 30 per cent.

EXPERIMENT 51.—*Showing the effect of friction in connection with the cold bath in increasing heat elimination (page 304).*

The subject, E. F. O., a young man aged 26, weight 105 lbs., was placed in a bath-tub calorimeter containing 400 pounds of water at 70°. Without friction the temperature of the water rose at the rate of .72° F. in five minutes. When friction was applied, the temperature of the water rose at the rate of 1.08° F. every five

minutes. By calculation it appears that the rate of heat elimination was, without friction, 57.6 heat units per minute; with friction, 86.4 heat units, an increase of 50 per cent.

EXPERIMENT 52.—*Showing the effects of the cold enema upon the body temperature in a normal, healthy person (page 318).*

The subject, L. H. W., was a young man aged 30, weight 166 lbs. The initial temperature was, mouth 99°; rectal, 99.7°. The temperature of the water administered was 70° F., the amount, 8 pints. This quantity was introduced in three portions within 57 minutes, each succeeding portion being introduced immediately after the discharge of the preceding. At the end of the experiment, the mouth temperature was found to be 98.4°, a decrease of .6°; the rectal temperature was 94°. The axillary temperature at the beginning of the experiment was 97.2°; at the end, 97.6°. The rise in axillary temperature which usually occurs in connection with the cold enema is due to the contraction of the mesenteric vessels, producing a movement of blood toward the surface, especially of the upper portion of the body.

EXPERIMENT 53.—*Showing the effects of percussion in increasing the intensity of the reaction from cold.*

(a) The subject, W. P. L., was a young man aged 21, weight 140 lbs. The initial surface temperature obtained by placing a surface thermometer at a point near the umbilicus was 97.6°. A percussion douche was administered at 55°, duration forty seconds. Immediately after the application, the surface temperature, determined at the same point, was 94.6°. The initial temperature was reached at the end of fourteen minutes. (See also experiment 36.)

(b) The subject, A. G. F., was a young man aged 23, weight 132 lbs. The cold compress and the percussion douche were simultaneously given at 65° for five seconds, to opposite and corresponding parts. After the cold compress, the time required for reaction was forty seconds, whereas after the percussion douche with pressure at 30 lbs., the circulatory reaction appeared in five seconds.

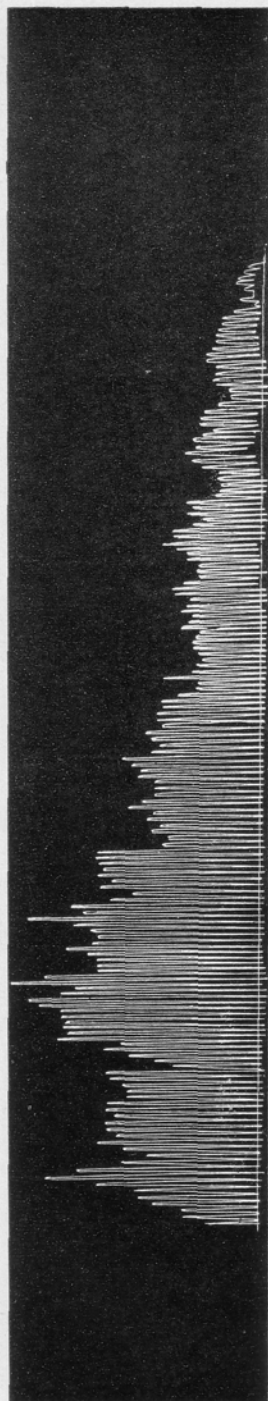


Fig. 261 (Exp. 54). Normal Fatigue Curve of a Young Man Who Was the Subject of Experiment. Total work, 1.312 kgm. (p. 1127).

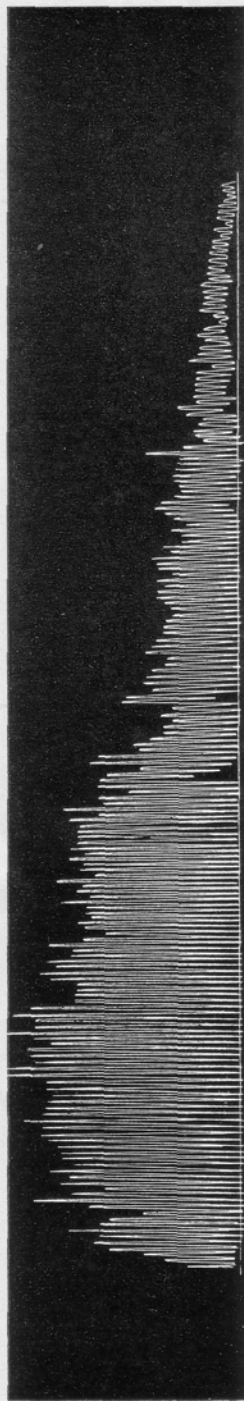


Fig. 262 (Exp. 54). Fatigue Curve Obtained from the Same Subject as the Preceding after a Douche at 55° for Fifteen Seconds. Total work, 1.527 kgm. (p. 1127).

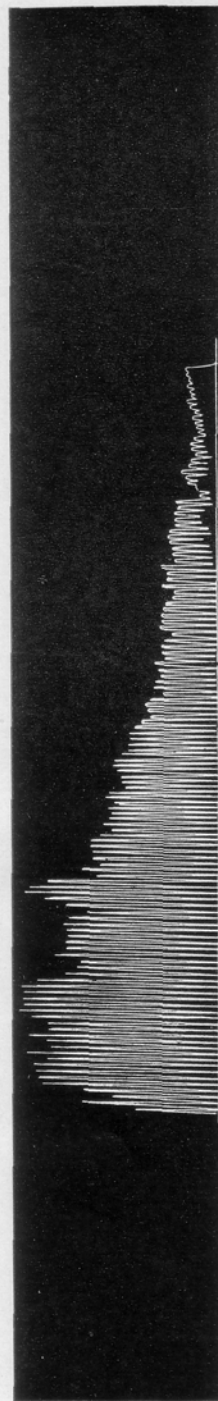


Fig. 263 (Exp. 54). Fatigue Curve Obtained from the Same Subject after a Douche at 115° for Five Minutes. Total work, .927 kgm. (p. 1127).

EXPERIMENT 54.—*Showing the effect of cold applications upon the muscular response to electrical currents (page 438).*

The amount of work done before and after the application was measured by Mosso's ergograph (see Fig. 255, page 1123), in which a spring resistance was substituted for the weights (this modification was suggested by Dr. E. Otis). The results obtained are shown in Figs. 261, 262, and 263. Fig. 261 shows the normal curve. The amount of work done was 1.312 kgm. After a douche at 55° for fifteen seconds, as shown in Fig. 262, the work done was 1.527 kgm. After a douche at 115°, duration five minutes, the ergogram shown in Fig. 263 was obtained, and the amount of work registered was .927 kgm. The capacity for muscular work was thus increased 16.4 per cent by the cold douche to the arm, and diminished 29.3 per cent by the hot douche. The increased amount of work done was due to the more energetic contraction of the muscles.

The observation was constantly made that the resistance of the skin is increased to a marked degree after a cold application; that is, after the application of cold to the parts while the current is passing there is immediate decrease in the reading of the milliamperemeter, while an application of heat produces the opposite effect, without any change in the adjustment of the rheostat.

EXPERIMENT 55.—*Showing the effect of the general cold douche on the capacity for muscular work (page 438).*

The subject, A. E. L., was a young man aged 26, weight 151 lbs. His normal fatigue curve is shown in Fig. 264. After the administration of a general douche at 60° for three minutes, a second ergogram was obtained, shown in Fig. 265. The amount of work registered before the douche was 8.282 kgm.; after the douche the total work was 11.966 kgm. an increase of 44 per cent.

EXPERIMENT 56.—*Showing the effects of heat and cold on the capacity for muscular work (page 438).*

(a) The subject, A. E. L., a young man aged 26, weight 151 lbs., gave the normal fatigue curve shown in Fig. 266; total work, 6.371 kgm. A general douche at 56° for fifteen seconds was then administered, and another ergogram obtained, shown in

Fig. 267. The amount of work registered was 8.448 kgm., an increase of 32 per cent. A general hot douche (temperature  $112^{\circ}$ , duration fifteen min.) was then administered, and another ergogram obtained, shown in Fig. 268. The total amount of work done was 4.155 kgm., a decrease of 33 per cent.

(b) On another occasion, a hot immersion bath was given the same patient at  $104^{\circ}$  for twenty minutes with the following result: Normal fatigue curve, shown in Fig. 269; amount of work registered, 8.033 kgm. After the bath, the fatigue curve shown in Fig. 270 was obtained, showing a notable depression. The amount of work registered was 4.459 kgm., a decrease of 44 per cent.

EXPERIMENT 57.—*Showing the effects of very hot applications in producing an initial slowing of the pulse with subsequent increase (page 448).*

In the subject, A. C. S., a young man aged 23, weight 137 lbs., the normal radial pulse rate was found to be 70. The arterial tension, as indicated by Gærtner's tonometer (see Figs. 239, 240, page 931), was 9 cm. The subject was placed in an immersion bath at  $102^{\circ}$ . The pulse immediately fell to 61. At the end of fifteen minutes, the pulse rate was 87, and the tonometer registered 6 cm., showing a marked fall in blood pressure.

By comparison with Experiment 40, it will be noted that local hot applications produce a rise in blood pressure, as indicated by the tonometer, while general hot applications produce a fall, as shown above. Thirty minutes after the bath, the pulse rate was 60 and the tonometer reading 8 cm.

EXPERIMENT 58.—*Showing the effects of the cold and the neutral immersion bath on capacity for muscular work (page 529).*

(a) The subject, A. E. L., was a young man aged 26, weight 151 lbs. The normal fatigue curve obtained is shown in Fig. 271. The total amount of work done was 5.817 kgm. After a general douche at  $55^{\circ}$  for fifteen seconds, the fatigue curve shown in Fig. 272 was obtained, and the amount of work registered was 8.642 kgm., an increase of 48.5 per cent.

(b) A neutral immersion bath administered to the same subject produced practically no effect on the capacity for muscular work, as shown in the normal fatigue curve presented in Fig. 273. Total work, 5.789 kgm.



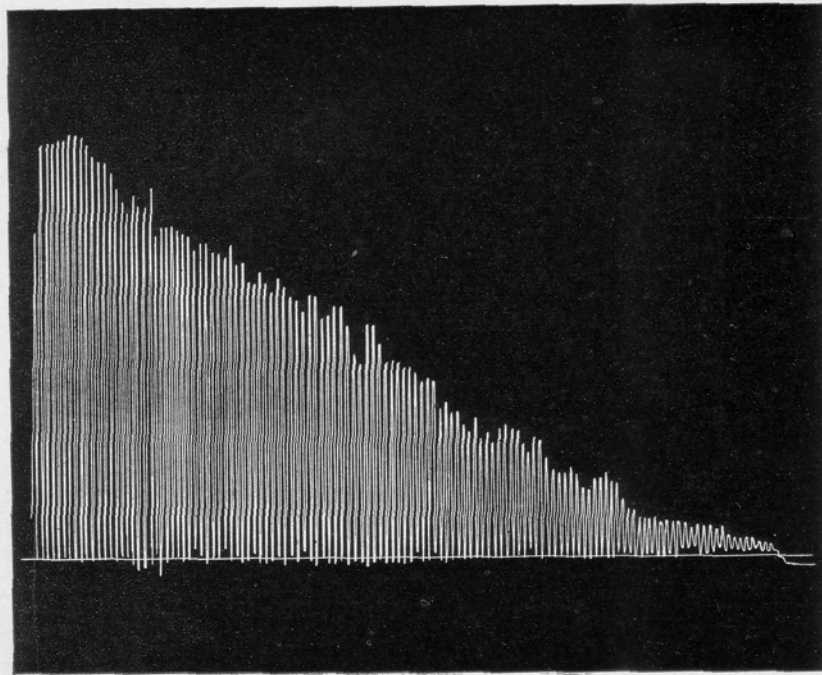


Fig. 264 (Exp. 55). Normal Fatigue Curve of A. E. L. Total work, 8.282 kgm. (p. 1127).

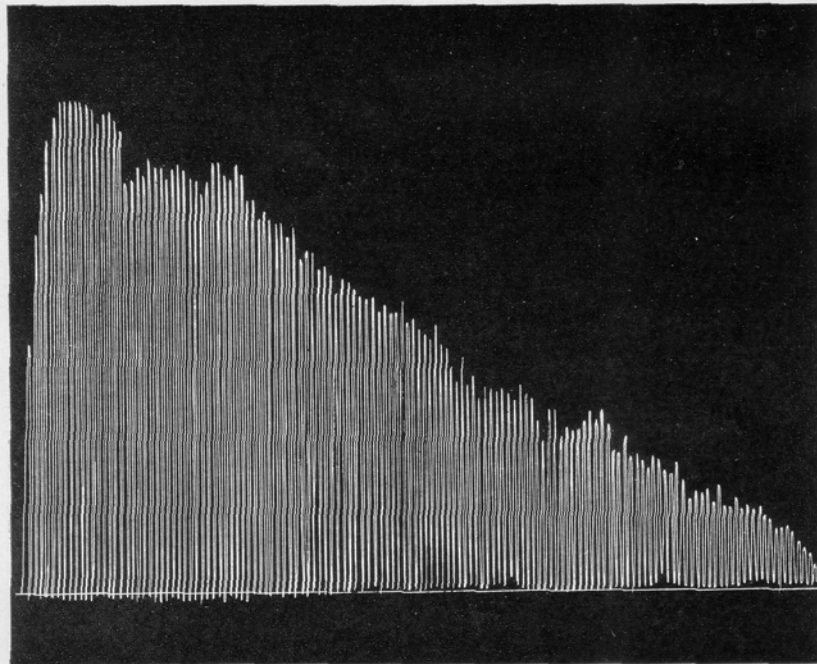


Fig. 265 (Exp. 55). Fatigue Curve of A. E. L. after a General Douche at 60° for Three Minutes. Total work, 11.966 kgm. (p. 1127).

EXPERIMENT 59.—*Showing the effects of the cold shallow bath on capacity for muscular work* (page 597).

The subject, W. P. L., was a young man aged 21, weight 140 lbs. A shallow bath was administered at 65° for two minutes, with the result of increasing the capacity for muscular work 32 per cent, as shown in the fatigue curves presented in Figs. 274 and 275.

EXPERIMENT 60.—*Showing the effects of a tonic application of the wet-sheet pack upon muscular work* (page 615).

The subject, W. P. L., aged 21, weight 140 lbs., gave the normal fatigue curve shown in Fig. 276. The wet-sheet pack was applied at 60° for twenty minutes, after which the fatigue curve shown in Fig. 277 was obtained. The amount of work registered was increased from 4.791 kgm. to 5.456 kgm., or a gain of 14 per cent.

EXPERIMENT 61.—*Showing the effects of oiling the skin upon heat elimination by conduction* (page 685).

The subject, E. F. O., was a young man aged 26, weight 105 lbs. When placed in a d'Arsonval calorimeter (see Fig. 24, page 89) in a room at a temperature of 82° F., the movement of air was at the rate of 100 feet per minute. The subject was then removed from the calorimeter and smeared with vaseline. Upon returning to the calorimeter, the rate was 55 feet per minute, a decrease of 45 per cent.

Numerous observations made with the bath-tub calorimeter agreed with the above results.

EXPERIMENT 62.—*Showing the effects of Russian, electric-light, and Turkish baths upon the body temperature* (page 704).

(a) The subject, A. C. S., a young man aged 23 years, weight 137 lbs., was given a Russian bath at 115° for twenty-five minutes. At the beginning of the bath, the pulse rate was 56; rectal temperature, 99.9°. At the conclusion of the bath, the pulse rate was 130; rectal temperature, 102°, an increase of 258.9 heat units ( $137 \times 2.1 \times .9 = 258.9$ ). The normal amount of heat produced in twenty-five minutes is about 180 heat units, leaving 78.9 heat units to be accounted for either by increased heat production or absorption. Other observations indicate the probability of an increase in heat production.

(b) The subject, V. P., aged 26 years, weight 130 lbs., was placed in an electric-light bath for twenty-three minutes. At the beginning of the bath the pulse rate was 82; rectal temperature, 99.9°. At the end of the bath, the pulse rate was 134; rectal temperature, 101.4°; mouth temperature, 102°, an increase of 175.5 heat units ( $130 \times 1.5 \times .9 = 175.5$ ). The amount of heat normally produced during the time covered by the experiment is about 165.6 ( $23 \times 7.2$ ), almost exactly the amount represented by the elevation of temperature. As heat elimination, either by radiation or evaporation, is not interfered with during this bath, the increase was probably the result, in part, at least, of augmented heat production.

(c) P. H., a young man aged 25 years, weight 150 lbs., was given a Turkish bath for one hour at 146° to 158°. At the beginning of the bath, the pulse was 49; rectal temperature, 98.9°. At the end of the experiment, the pulse rate was 59; rectal temperature, 100.6°, and respiration increased from 13 to 19 per minute. The elevation in temperature represented an accumulation of 229.5 heat units. In many subjects more marked effects are produced.

EXPERIMENT 63.—*Showing the influence of the cold proximal compress upon the temperature of distal parts (page 760).*

The subject, A. C. S., was a young man aged 23, weight 137 lbs.; initial temperature, axilla, 99.8°; palmar surface, hand closed, 98.1°. The elbow was immersed in water at 42° for thirty minutes, at the end of which time the axillary temperature was 100.8°, and the hand temperature, 96.1°.

EXPERIMENT 64.—(Page 774.)

The surface temperature of the cheek was determined to be 97.3°. Ice was then placed in the mouth, and held in contact with the mucous surface of the cheek for fifteen minutes. The temperature of the cutaneous surface was reduced to 89.6°.

EXPERIMENT 65.—(Page 774.)

The temperature of the inner surface of the cheek was taken, and found to be 98.6°. By the application of ice to the outer surface of the cheek for fifteen minutes, the temperature of the inner surface was reduced to 90° F.

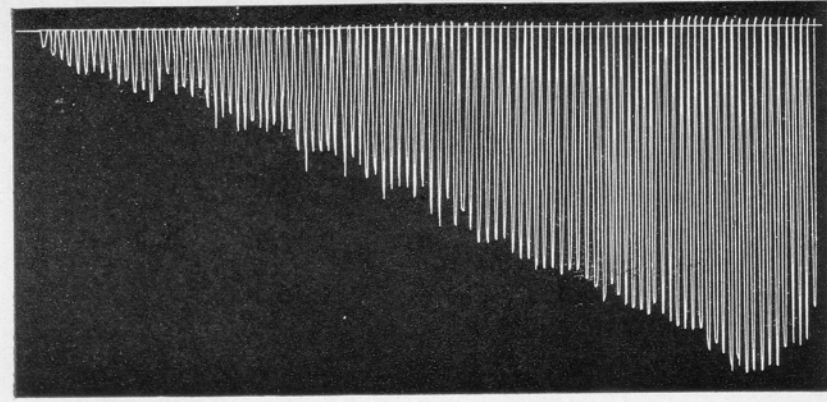


Fig. 266 (Exp. 56a). Normal Fatigue Curve of A. E. L. Total work, 6.371 kgm. (p. 1128).

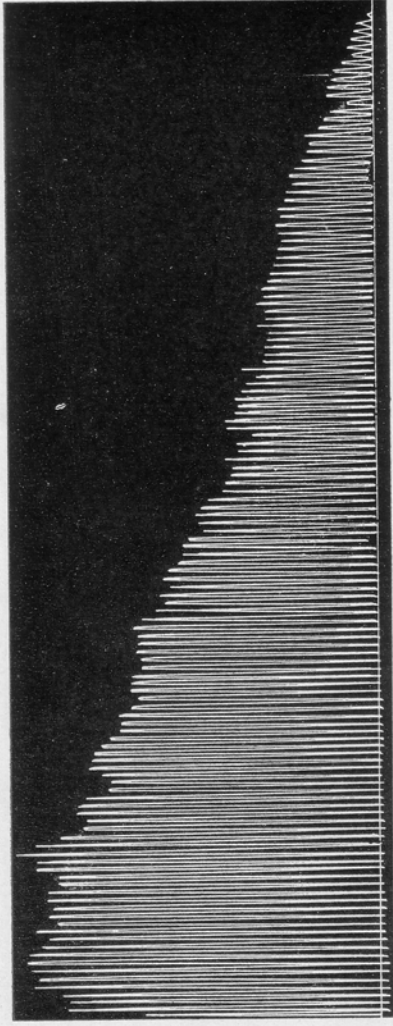


Fig. 267 (Exp. 56a). Fatigue Curve of A. E. L. after a General Douche at  $56^{\circ}$  for Fifteen Seconds. Total work, 8.448 kgm. (p. 1128).

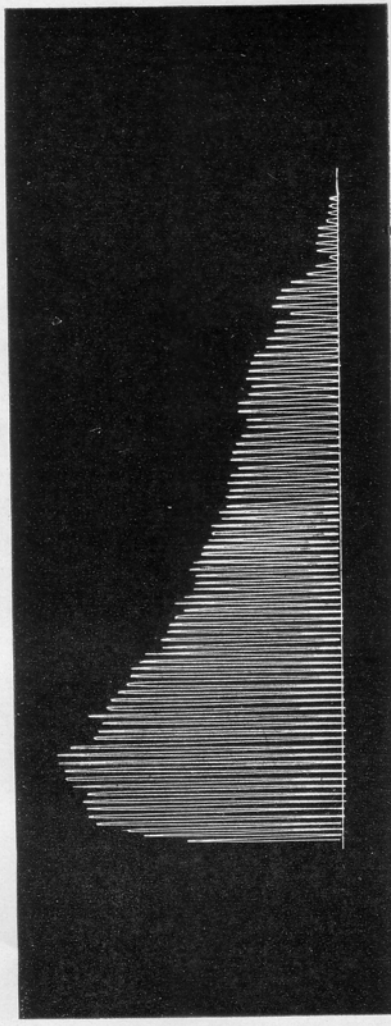


Fig. 268 (Exp. 56a). Fatigue Curve of A. E. L. after a General Douche at  $112^{\circ}$  for Fifteen Minutes. Total work, 4.155 kgm. (p. 1128).

EXPERIMENT 66.—(*Page 774.*)

The subject, F. G. L., was a young man aged 21, weight 135 lbs. The rectal temperature was taken and found to be  $99.8^{\circ}$ . An ice compress was applied to the abdomen and sacrum. At the end of thirty minutes, the rectal temperature had fallen to  $98.6^{\circ}$ , clearly showing the value of these applications in rectal and pelvic inflammations. It should be borne in mind that the reduction in internal temperature resulting from a cold application to the cutaneous surface is not due to the abstraction of heat from, or direct cooling of, the internal part, but is brought about indirectly through the reflex contraction of the blood-vessels of the part, and the lessened tissue activity resulting from diminished blood supply.

EXPERIMENT 67.—(*Page 774.*)

In a subject whose initial rectal temperature was  $99.8^{\circ}$ , an ice compress to the abdomen and sacrum, combined with the hot foot bath, reduced the rectal temperature in one hour and ten minutes to  $97.4^{\circ}$ .

EXPERIMENT 68.—(*Page 791.*)

(a) An ice compress was applied to the knee of a young man, W. P. L. The initial temperature of the foot was  $94^{\circ}$ . At the end of thirty minutes the temperature was reduced to  $91.5^{\circ}$ .

(b) An ice compress applied about the thigh for forty-five minutes reduced the temperature of the foot from  $94^{\circ}$  to  $91^{\circ}$ .

(c) An ice bag applied to the axilla for thirty minutes reduced the temperature of the hand from  $97^{\circ}$  to  $96^{\circ}$ .

(d) An ice collar applied to the neck produced the following results: The initial pulse of the subject, V. P., was 77; the temperature, taken in the external auditory meatus,  $98^{\circ}$ ; mouth temperature,  $97.8^{\circ}$ ; rectal,  $99^{\circ}$ . At the end of fifty minutes the pulse was reduced to 56; the temperature of the external auditory meatus was  $93^{\circ}$ ; mouth temperature,  $93.7^{\circ}$ ; rectal,  $98.4^{\circ}$ . The pulse was reduced 21 beats; the temperature of the external auditory canal,  $5^{\circ}$ ; the mouth,  $4.1^{\circ}$ ; and the rectal temperature,  $.6^{\circ}$ .

EXPERIMENT 69.—*Showing the rate of heating of the abdominal compress protected with flannel only (page 826).*

Three experiments were made on a subject, a young man, A. E. L., aged 26, weight 151 lbs. The procedure consisted of the application of an ordinary heating abdominal compress, using a linen cloth for the moist layer, covering with flannel, employing different thicknesses in the different experiments. The temperature of the water used was 59° F., the room temperature 77° F. The temperature was taken at the end of the first and second minutes, then every two minutes afterward until the maximum temperature was reached. The results were as follows:—

(a) Employing one layer of flannel to cover the wet compress, the temperature at the end of the first minute was found to be 81.5°; the maximum temperature, 86.5°, was reached at the end of eight minutes.

(b) With two layers of flannel, the temperature was found at the end of the first minute as in the preceding experiment, 81.5°. The maximum temperature of 89.3° was reached at the end of ten minutes.

(c) The moist bandage was covered with four thicknesses of flannel. Temperature at the end of one minute was 82.5°; the maximum temperature of 91.8° was reached at the end of ten minutes.

EXPERIMENT 70.—*Showing the rate of heating of the heating abdominal compress, when protected with mackintosh or other impervious material (page 826).*

These experiments were made with the same subject as the preceding and the conditions were the same:—

(a) With one thickness of flannel, the maximum temperature 91.4° was reached at the end of fifteen minutes.

(b) With two thicknesses of flannel, the maximum temperature of 92.1° was reached at the end of twenty minutes.

(c) With four thicknesses of flannel, the maximum temperature of 93.6° was reached at the end of twenty minutes.

(d) With eight thicknesses of flannel, the maximum temperature of 94.7° was reached at the end of twenty minutes.

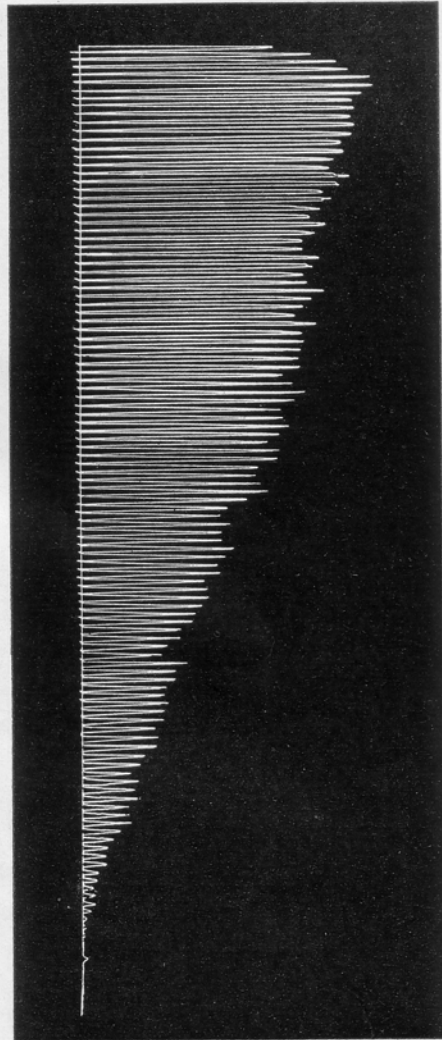


FIG. 271 (Exp. 58). Normal Fatigue Curve of A. E. L. Total work, 4.791 kgm. (p. 1128).

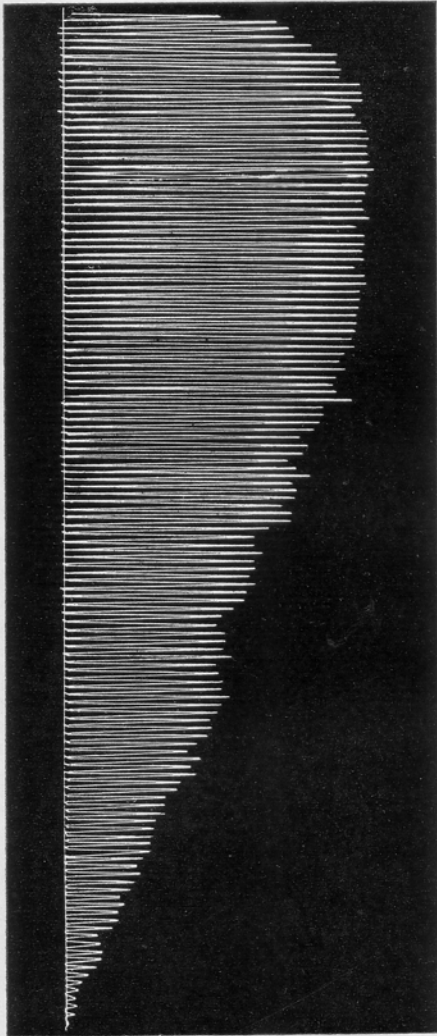


FIG. 272 (Exp. 58). Fatigue Curve of A. E. L. after General Horizontal Jet at 55° for Fifteen Seconds. Total work, 8.642 kgm. (p. 1128).

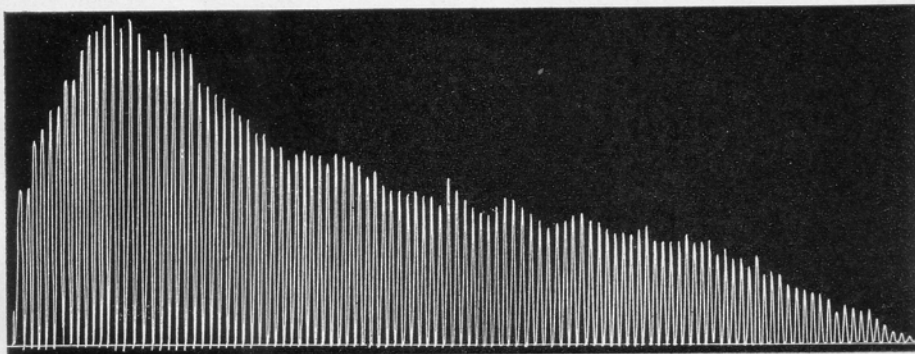


FIG. 273. (Exp. 58). Fatigue Curve of A. E. L. after Neutral Immersion Bath. Total work, 5.789 kgm. (p. 1128).

EXPERIMENT 71.—*Showing the effect of the chest compress upon the volume of tidal air (page 862).*

The subject, J. C. B., was a young man aged 27, weight 132 lbs. The normal amount of tidal air was 507 c.c. The application of the chest compress, wrung from ice-water, produced an immediate increase in the depth of the respiratory movements and the volume of the tidal air rose at once to 751 c.c., an increase of 48 per cent. At the end of twenty minutes, when the experiment terminated, the amount of tidal air was 604 c.c., 20 per cent more than at the beginning. The average increase for the whole twenty minutes was 170 c.c., or 33 per cent.

EXPERIMENT 72.—*Showing the effects of the cold precordial compress upon the rate and force of the heart beat (page 868).*

(a) The subject was a young man aged 35, weight 122 lbs. A sphygmographic tracing obtained before the application of the compress, is shown in Fig. 207 (a), page 868; pulse rate, 72. A cold application, consisting of an ice-poultice one foot square, was applied over the heart and left chest. The effect was an immediate increase of the pulse rate to 76 for two minutes. The pulse was then slowed, becoming at the end of three minutes 72. A second sphygmographic tracing was then taken, shown in Fig. 207 (b), page 868. Comparison of the two tracings shows clearly the increased tension resulting from the application.

(b) The subject was a patient, Mr. W., suffering from severe collapse following a prolonged and complicated abdominal operation for the removal of impacted gallstones. Before the application of the compress, the patient's pulse was so weak that it could not be felt at the wrist. When counted by means of the stethoscope placed over the heart, it was found to be 120. An ice-bag was applied over the heart with the result that the pulse could be counted at the wrist, the rate was slowed to 87, and the tension, which was zero as indicated by Gærtner's tonometer, rose to 5 cm.

(c) The subject, R. M. B., was a young man aged 23, weight 130 lbs.; pulse, 80; tonometer reading, 13. After the application of cold to the precordial region, there was an immediate increase in tension to 17. In two minutes the tension fell to 16, and the pulse to 70. At the end of twenty-five minutes, the pulse was 64, and the tonometer reading 15.



EXPERIMENT 73.—*Showing the effect of cold-water drinking upon the axillary temperature and the surface temperature as determined at the epigastrium (page 928).*

The subject, A. G. M., was a young man aged 26, weight, 153 lbs.; axillary temperature, 97.7°; mouth, 98.7°; rectal, 99.2°; surface temperature at the epigastrium, 97°. The patient drank in rapid succession seven glasses of lemonade at 58°. A fall in the axillary temperature was noted in five minutes. At the end of twenty minutes, the axillary temperature was 96.1°; mouth, 98°; rectal, 98°; surface temperature at the epigastrium, 92°.

The great fall in surface temperature at the epigastrium, after drinking ice-water, may be utilized as a means of locating the stomach and determining its size and contour. The interesting fact that a very marked depression in the surface temperature of the skin overlying the stomach takes place as the result of drinking a quantity of ice-water, was first noted by Dr. F. J. Otis (1898), while a medical student, engaged in carrying out experimental researches under the direction of the author.

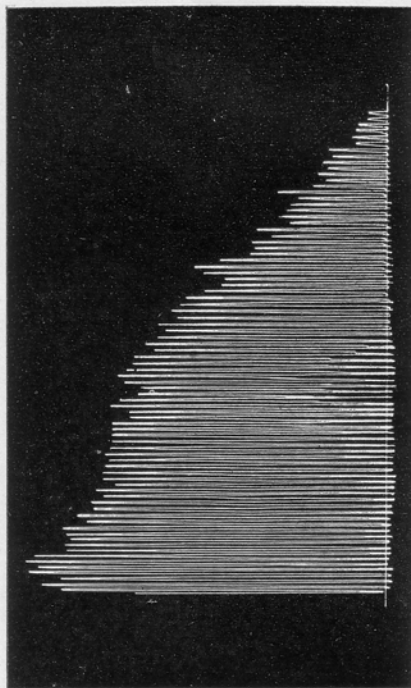


Fig. 274 (Exp. 59). Normal Fatigue Curve of W. P. L. Total work, 5,761 kgm. (p. 1129).

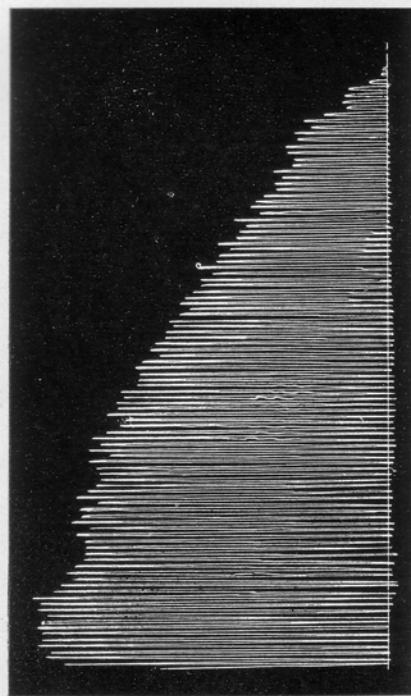


Fig. 275 (Exp. 59). Ergogram of W. P. L. after Shallow Bath at 65° for Two Minutes. Total work, 7,589 kgm. (p. 1129).

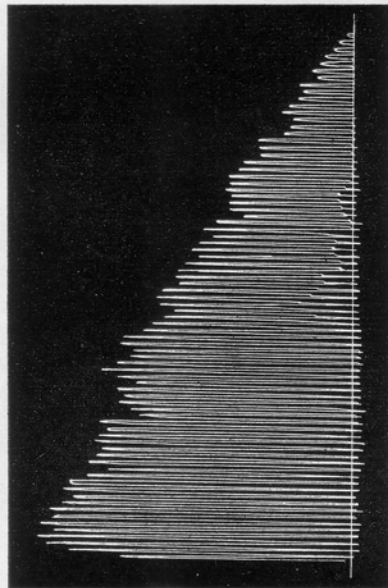


Fig. 276 (Exp. 60). Normal Fatigue Curve of W. P. L. Total work, 5,761 kgm. (p. 1129).

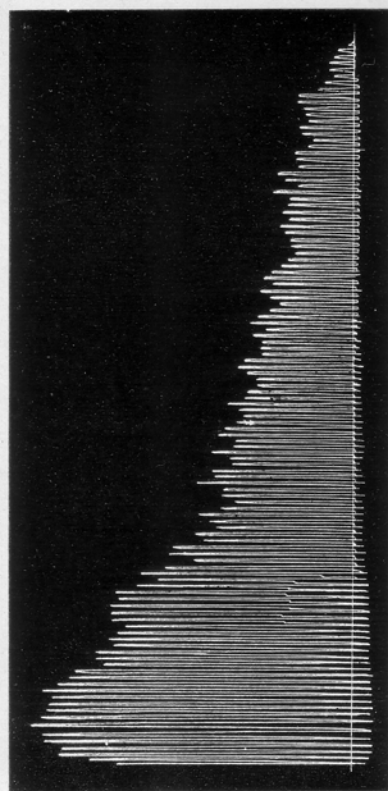


Fig. 277 (Exp. 60) Fatigue Curve of W. P. L. after a Wet-Sheet Pack at 60° for Twenty Minutes. Total work, 5,495 kgm. (p. 1129).

## BIBLIOGRAPHY.

WITH very few exceptions all the following authorities have been consulted in the preparation of this work, and a considerable number are referred to in foot-notes in the preceding pages. This list, however, is not presented as by any means complete. The bibliography of hydrotherapy has within the last few years grown to enormous proportions. It is believed, however, that the major part of what is worth reading upon this subject may be found in the works named below. The authorities indicated by numeral reference marks are referred to in Parts I and II.

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