

Pure metallic mercury boils at 662° , and is apt to sputter on the application of dry heat before it volatilizes. It takes considerable heat to vaporize it. When the red sulphuret of mercury is employed, the fumes are those of sulphurous acid and metallic mercury; the former is often irritating to the pharynx and lungs, and the preparation should not be used without circumspection.

3. *Inunction*.—Sigmund, of Vienna, is the present apostle of the "inunction cure of syphilis," a method of very ancient origin. Inunction is, perhaps, of all, the best means of exhibiting mercury. It spares the stomach, and rarely salivates, and though, in special cases, it may produce any of the bad effects of mercury, yet it is, undoubtedly, of all methods the least apt to do so. The only objections to its continued use are that it requires time and care for its proper application, is not cleanly, and may give rise to a local eczema.

Should this eruption occur, it is treated with soothing ointments. The best preparations to use in inunction are the oleates of mercury. They are found in the shops of three strengths, five, ten, and twenty (sometimes thirty) per cent. of the peroxide of mercury, combined (chemically) with oleic acid. They are rather expensive. The five-per-cent. preparation resembles linseed-oil; the twenty-per-cent. is thick, pasty, yellowish. The disagreeable odor may be corrected by the addition of a few drops of oil of roses. The twenty-per-cent. preparation is actually eighteen and a half per cent., a little more than one-third the strength of strong mercurial ointment, which contains fifty per cent. of mercury—the others in proportion. Twenty-per-cent. oleate irritates the skin, but not as much as mercurial ointment. It is more cleanly, and seemingly capable of much more thorough and rapid absorption. The five-per-cent. oleate may be rubbed daily upon the same portion of integument in many individuals without producing the least irritation. Choosing one of these preparations, according to the irritability of the skin and the effect desired, preferably the twenty-per-cent., the patient with his own fingers rubs it gently into any convenient portion of the skin until the proper dose has been used, and it has mostly sunken into the integument. The scrotum is to be avoided, and a different portion of integument chosen each night. Absorption is most rapid through the soft skin of the flexures of the joints. After the friction has been made, the part is covered with a bandage, to preserve the clothes, for twenty-four hours, when the spot is washed with soap and warm water, and a new inunction is made elsewhere. The dose for an inunction of the twenty-per-cent. oleate is about $\mathfrak{z}\text{j}$, of the others, proportionately more. Mercurial ointment—more dirty, less effective, less expensive—may be used in the same way, at a dose of $\mathfrak{z}\text{ss}-\text{j}$ at a friction.

Another excellent endermic method¹ of giving mercury is, to spread out upon a fold of thick bandage mercurial ointment, or better, twenty-

¹ Known as Teale's method.

per-cent. oleate over a space about as large as the palm, and to bind this around the arm, forearm, leg, thigh, body, in succession, keeping the mercury against the thinnest portions of the skin. Such a bandage may be worn twenty-four, forty-eight hours, in some cases indefinitely, for weeks without washing the spot. It should be studiously inspected, however, and removed at once on the advent of itching or the appearance of any erythema. When it is removed, the surface should be washed with soap and warm water.

2. *Local Use of Mercury*.—This will be referred to in connection with the different lesions. The local application of mercury alone, or (in ulcerated lesions) in combination or alternating with iodoform, has a positive beneficial (local) influence. Powders, solutions, oleates, ointments, all have their merits.

1. *Mercury by the Stomach*.—This means must be adopted in the vast majority of cases, and it is only in examples of rare idiosyncrasy that it is objectionable. As already stated, the general action of mercury taken by the stomach is not so rapid as by other means. It may, however, be so taken for any length of time, is very little troublesome, can be continued while traveling, and without making the patient conspicuous to his friends.

Several forms of mercury have proved themselves by experience to be especially adapted to prolonged use by the stomach in syphilis; they are the protiodide, the bichloride, blue-pill, and gray powder; the latter has been used chiefly with infants. Calomel is useful in those cases where it is desirable to bring the patient very rapidly under the full influence of mercury. Administered in one-twelfth-grain doses every hour, it will often "touch the gums" in twenty-four to forty-eight hours, and with safety, for its prompt discontinuance on the first appearance of signs of salivation prevents the development of the latter. These preparations leave little to desire. The gray powder is least irritating to the stomach, blue-pill next, then protiodide, and most acrid the bichloride. Their power over the disease is, however, not at all dependent on their irritating properties, and, though this or that susceptibility or irritability may render the choice of this or that preparation advisable, yet for the great majority the protiodide is the best. It is well borne by most stomachs, and is sufficiently powerful. The American protiodide is of irregular strength, and very apt to be highly irritating when used in effective doses. The best preparation known is the imported one (French), preferably as found put up in sugar-coated granules, one-fifth grain each, by Garnier and Lamoureux. In using this preparation it is best to commence with one granule after each meal (three daily), and to add one granule every third or fourth day to the daily dose (not to each dose), until either the metallic taste is complained of, or some slight intestinal irritation is felt, or until three granules can be taken at a dose. It is rare to find a patient who will support more than three. On the

advent of any irritation at the mouth, or in the intestine, the dose is to be slightly decreased. When the proper dose is reached (two or three granules), it is steadily maintained. If the mercurial course has been begun early, no eruption may appear, or only a few scattered papules, some glandular engorgement, and a few mucous patches which will rarely escape an attentive observation, somewhere between the second and the sixth month.

Should a more positive outbreak appear at any time during the mercurial course, instead of increasing the dose by the stomach, it is better to resort to inunction or fumigation, in addition to, or in place of, the regular treatment, until the eruption disappears, and then to continue steadily with the granules of the protiodide without intermission for at the very least one year. Instead of employing inunction, if the stomach be powerful, on any given outcrop of eruption the bichloride may be substituted for the granules at a dose beginning at one-twentieth of a grain, in a bitter menstruum, increasing until the symptoms yield, or some disagreeable result of mercurialization seems imminent, carrying the dose to one-eighth or one-sixth of a grain.¹ The common solution in tincture of bark (or the elixir) is as good as any that can be desired:

℞. Hydrarg. bichlorid.,
Ammonii sesquichlorid., aa gr. jss-ijj.
Tr. cinchonæ co., ʒ ij.
M. S. Teaspoonful, largely diluted in water, after eating,

Or the old New York Hospital formula—

℞. Hydrarg. bichlorid., gr. iv.
Tr. ferri sesquichlorid., ʒ j.
S. Ten drops in water after eating—

may be exhibited with good effect in anæmic cases where the stomach is not weak, as in the earlier outbreaks attended by syphilitic fever, where a tonic is particularly required—in some cases indeed to the total exclusion of mercury. When it is deemed advisable to give the bichloride in pill-form, it may be combined with reduced iron, as in the following:

℞. Hydrarg. bichlorid., gr. j.
Ferri redact., ʒ jss.
Gum. tragacanth., } q. s.
Glycerini, } }
M. F. pil., No. xv.

In anæmic women the New York Hospital formula is a good one, in which blue-pill gr. ij is combined with gr. j of the dried sulphate of iron in pill-form. The quantity of either ingredient of the pill may be increased if circumstances require. Finally, the gray powder (hydrarg.

¹ Muriate of ammonia is frequently added to solutions containing the bichloride, to increase the solubility of the latter, where large doses are given. A saturated solution of hydrochlorate of ammonia dissolves seventeen times more bichloride than simple water.

cum cretâ) may be employed, increasing from two-grain doses. It is very mild in its action.

TREATMENT OF LATE SYPHILIS.

This includes the use of the iodide of potassium. The iodides are rarely of value in the early stages of the disease. They are often given instead of mercury during syphilitic fever, but their action is probably purely tonic, and not at all specific in such cases, since their administration does not have any appreciable effect over the duration of the early syphilitic exanthemata. The iodides are useful early in cases of precocious syphilis, where lesions of bone, nervous manifestations, or deep ulcers, come on shortly after chancre.

As soon, however, as the cutaneous lesions of syphilis show a marked tendency to aggregate into patches, and especially to remain long chronic, as scaly or tubercular thickened patches, or, indeed, without eruption, after the first year of treatment, the iodide should be used with mercury in the form of treatment called mixed. Again, all lesions certainly or presumedly gummy, ulcers, gummy tumors, deep lesions of bone, of brain, of viscera, require the iodide in large excess, often without the addition of mercury, until the symptom is controlled, then again in combination and in reduced dose.

Mixed Treatment.—There are many methods of employing the mixed treatment, of which but three require mention:

1. When the two drugs are mixed in the same prescription.
2. When they are given separately at the same or different hours of the day.
3. When the iodide internally is combined with inunction.

1. *Mixing the two drugs in the same prescription* is the best method for prolonged use. Either ingredient of the prescription may be raised or lowered according to the requirements of the case. The following "syrup of the biniodide" is at once palatable and efficient. Ammonia in some form is generally added to prescriptions containing the iodides, under the idea that it improves and intensifies their action.

℞. Hydrarg. biniod., gr. jss.
Ammonii iodid., ʒ j.
Potass. iodid., ʒ ij.
Syr. aurant. cort., ʒ j.
Tr. ejusdem, ʒ j.
Aqua, ad. ʒ ij.
M. S. Teaspoonful, largely diluted with water, after eating.

The iodide of sodium may be substituted for the iodide of potassium, and the sesquichloride for the iodide of ammonium, in the above, and the dose increased according to the requirements of the case. A prescription in common use and based on high authority, wherein the bichloride of mercury is given with iodide of potassium in solution,

although undoubtedly effective, is unchemical, and no better than a fresh combination of the biniodide with the iodide of potassium. The bichloride in contact with the iodide of potassium is decomposed and becomes biniodide.

The mixed treatment may be carried out in pill-form, where only small doses of the iodide are required. Where the dose is large, solutions should invariably be used. Ordinary pills containing iodide of potassium are difficult to keep, on account of tendency to deliquesce. They may be kept, however, in bottles with tight rubber stoppers. A pill containing five grains of the iodide with one-sixteenth of a grain of the biniodide is not inconveniently large. Such pills should be taken during, or immediately after, a meal.

For convenience of administration, where only small doses are required, Dunton has prepared three sets of "compressed pills," which keep perfectly well, and form an elegant preparation. They contain simply the biniodide of mercury with the iodide of potassium, in the proportion of one-twentieth of a grain to three grains, one-sixteenth of a grain to four grains, one-twelfth of a grain to five grains.

2. *Where the drugs are given separately* the iodide is administered in water or in syrup, the mercury in pill, syrup, in any of its forms, at a suitable dose. Usually a mercurial pill is taken once or twice daily, and a solution of the iodide given at separate hours. This plan presents no advantages, and is more troublesome than the ordinary mixed treatment.

3. *Iodide internally combined with inunction* (or even fumigation) is an excellent method of treatment, especially in old, chronic, inveterate cases, where the stomach must be spared as much as possible for food, but where the mild, efficient action of mercury seems to be required.

Treatment by the Iodides.—The more purely gummy any lesion, the more certainly will it yield to the iodides. Hence, these preparations are particularly suited to the treatment of the late manifestations of syphilis. No agent in medicine is more brilliantly effective than the iodide of potassium, promptly and unsparingly used, in cases of rapid, destructive, gummy ulceration, as of the throat, nose, skin, or in sudden, violent attacks of nervous syphilis. Unfortunately, however, the iodides do not seem to have very marked curative virtues, gummy deposit often melts like snow under their use, but other symptoms appear after a time. Hence, however strong a weapon the iodides may be, mercury is more powerful in ultimately controlling the disease, and we are accustomed to resort to it in late cases, as well as early, to exercise a curative action, by keeping off subsequent so-called relapses.

THE BAD EFFECTS OF THE IODIDES are four, and are most apt to appear when the diuretic action of the drug is absent or deficient. The kidneys would seem to be the natural channels for elimination of the iodide; when it is retained, iodism results; when it attempts to escape by the

skin or mucous expansions, unpleasant symptoms are more apt to accompany its administration.¹ The bad effects of the iodides are:

1. Possible indirect causation of salivation.
2. Iodism.
3. Irritation of mucous membranes.
4. Cutaneous eruptions.

1. *Salivation.*—Indirectly the iodide of potassium may cause salivation, since it dissolves and renders active mercury which may be lying dormant in the tissues, causing its elimination. Hence, some care is necessary in commencing a course of iodide of potassium after a course of mercury, especially where the patient is known to be sensitive to the action of the latter drug. Indeed, the efficient action of the iodide over late symptoms has been ascribed to its power of liberating, rendering active, mercury already in the body. This position is unsound, since cases of tertiary disease, which have never been treated by mercury, yield promptly to the iodide. Bumstead quotes a striking case.² In this country we rarely encounter patients with syphilis who have not taken mercury.

2. *Iodism.*—A peculiar poisonous effect is produced upon some patients by the use of iodine, especially in the form of iodides.³ The symptoms are general irritation of the nerves, with depression; the ears ring, the head aches, neuralgic pains are felt deep in the bones and muscles. There is more or less general torpor, with physical and mental depression. This affection is rare. It may occur from the least touch of iodine, or large quantities may be required to produce it. It occurs with or without irritation of the cutaneous or mucous expansions.

3. *General irritation of more or less of the mucous expansions* of the body, with perhaps some nervous phenomena, headache, pains in the bones (iodism). In mild cases this takes the form of "catarrh," or a simple cold. A sharp coryza sets in, with sneezing and a plentiful watery discharge from the nose, perhaps with reddened conjunctivæ and streaming eyes. Bumstead mentions, in rare instances, loss of vision, due apparently to sub-retinal effusion. The lining of the frontal sinuses may be hyperæmic and swollen, occasioning considerable pain. The fauces and mucous lining of the lungs participate in these hyperæmic and secretory changes occasionally. The symptoms sometimes reach a high grade, from swelling and œdema. A marked increase of the salivary flow is observed.

¹ The supposed power of iodine, long administered, to cause atrophy of the testicles (the breast in the female), and abolish sexual vigor, is purely hypothetical. Temporary diminution of sexual appetite seems occasionally to depend upon the internal use of iodine, but the abolition of the power, or atrophy of the testicle, never—although syphilis may undoubtedly cause both the latter.

² From *Gazette des Hôpitaux*, January 28, 1860.

³ One physician in this city stated to me that the least contact even of tincture of iodine with the skin gave him symptoms of iodism. Another physician was at one time always disagreeably affected in a nervous way by touching his tongue to any solution containing the iodide of potassium.—KEYES.