indeed—that typhogenous virus develops especially in the last portion of the small intestine, Vulpian thought of this medicament, which seemed to him likely to reach without any alteration the diseased places in the intestine, and there combat, *in situ*, the development of the infectious organisms. But the results have not met his expectations; salicylate of bismuth has, indeed, lowered the temperature, but it has had no influence on the march of the disease. So, despite the more satisfying results which Desplats has obtained, this medication has not found much favor.[3]

Salicylic acid should be administered in capsules, and in a dose not exceeding sixty grains, for more than this determines, especially in females, cerebral excitation, buzzings in the ears, and gastro-intestinal irritation. I, moreover, am always careful to give at the same time a little milk to mitigate the symptoms of the latter, and when I come to speak more particularly of the details of management of this fever, I shall tell you the rules which I follow in giving salicy-

tinued progression and the evening exacerbations are less marked, so that in 24 or 36 hours the temperature falls to 98½ and even lower.

But this medicament has no action on the pulse. With defervescence there is produced an amelioration of all the general symptoms. At the same time the salicylic medication has no influence on the march of the disease; it does not diminish its duration or prevent relapses. Such are the principal results of Vulpian's observations.

Caussidon, of Algiers, considers salicylate of soda as the best antithermic agent to employ in typhoid fever; he gives 15 grains every two hours till the temperature falls to 100° F. (*a*)

[3] Salicylate of bismuth presents itself under the form of a pulverulent body of little solubility. The salicylate which is found in commerce always contains a certain quantity of free salicylic acid, and which varies according to the mode of fabrication. Jaillet has proposed the following process:

After having prepared a quantity of crystallized acid nitrate of bismuth, this salt is precipitated in 500 times its weight of water, rendered feebly alkaline by caustic soda, and containing in solution a proportion of salicylate of soda double that of the nitrate of bismuth employed.

After the deposition of the precipitate, you decant the supernatant liquid, and add a new quantity of pure water, and when the precipitate has been washed three times, to re-

(*a*) Buss, Ueber die Anwendung der Salicylsaeure als Antipyreticum (Deutsch. Arch. fur Klin. Med, 1875; zur Antipyretischen Bedeutung des Salicylsaeure, Stuttgard, 1876).—Riess, Ueber die innerliche Anwendung des Salicylsaeure (Berl. Klin. Woch., 1875, p. 181 et 194).—Schroeder, Zur Anwendung des Salicylsaeure, resp. des natron Salicylicum (Deutsches Arch. fur Klin. Med., 1876, Bd. XVIII, p. 514).—Nathan, Ueber die Bedeutung des natron Salicylicum als Antipyreticum (Diss. inaug., Kiel, 1875) —Fischer, Zur Antipyretischen Werkung des Salicylsaeure und des Salicylsauren natrons (Deutsch. Zeitsch. fur Prakt. Med., 1875).—Liebermeister, Handbuch der Pathologie and Therapie des Fiebers, p. 644.—Typhus abdominalis (Ziemssen's Handbuch der Specullen Path. und Therapie, Bd. II, 1874).—Antipyretische Medicamente (Ziemssen's Handbuch der Allgemeinen therapie, 1880, Bd. I, p. 69).—Ewald, On Salicylic Acid as an Antipyretic (the Pract., 1876).—Riegel, Ueber die innerliche Anwendung des Salicylsaeure (Berl. Klin. Woch., 1875, p. 673 et 699).—Goltdammer, Zur inneren Anwendung der Salicylsaeure (Berl. Klin. Woch., 1876).—Baelz, Salicylsaeure, Salicylsaeures Natron und thymol in irhem Einflus auf Krankheiten (Arch. der Heilk., 1877).—Alb. Robin, Note sur l'acide salicylique dans la fièvre typeoïde (Gaz. Méd. de Paris, 1877).—Garcin, Onze cas de fièvre typhoïde traités par l'acide salicylique (Journ. de thér., 1876).—Jaccoud, Traitement de la fièvre typhoïde (Mouv. méd, 1877, p. 164 et 181, et leçons sur le Traitement de la fievre typhoïde, 28 et 30 novembre 1882),—Hallopeau, Traitement de la fièvre typhoïde par le calomel, le salicylate de soude et le sulfate de quinine (Un. méd, 1881, et Soc. méd des hôp., 13 août 1880).—Vulpian, Traitement de la fièvre typhoïde par l'acide salicylique (Bull. Acad. de méd., 22 août 1882).—Caussidon, Traitement de la fièvre typhoïde par le salicylate de soude (Gaz. hebd., 1881, p. 283).—H. Rabeau, Etude sur la médication salicylée dans la fièvre typhoïde (thèse de Paris, 1883).

lic acid. In doses of from half a drachm to a drachm it lowers the temperature two or three degrees without much influencing the pulse. By not exceeding this quantity of the medicament, I have never observed any cardiac or nervous symptoms to follow. It is not so with the next antipyretic of which I shall speak, viz: carbolic acid.

Desplats, of Lille,[4] was the first to found the phenic medication of typhoid fever; the trials made previously by Pecholier, Tempesti, and Skinner were not successful, by reason of the small doses given. Desplats gives phenic acid in lavements containing twenty to thirty grains, and gives three or four of these a day; these lavements should be retained so that the medicament may be absorbed. Phenic acid has a considerable antipyretic action, and for my

move every trace of salicylate, the product is collected and dried rapidly in a stove heated to 104° F.

The substance which is thus obtained is quite crystalline, and constitutes the acid salicylate of bismuth, and has the following formula:

$$(Bi^2O^3)\,(C^{14}H^6O^4)^5 + {}^{16}HO.$$

After having prepared, by the method just given, the acid salicylate of bismuth, if you continue washing the precipitate till the decanted water no longer gives a violent reaction with perchloride of iron, you obtain a new salicylate of bismuth, which this time represents by its composition the sub-salicylate or basic salicylate of bismuth, which has for formula:

$$Bi^2\,O^3, C^{14}H^6O^4 \times {}^2Bi^2\,O^3, C^{14}H^6O^4.$$

It is then a mixture of two basic salts. Ragoucy has disputed the correctness of these formulas.

One of these salicylates, the acid salicylate, contains more than 50 per cent. of oxide of bismuth, and 40 per cent. of salicylic acid. The other, the alkaline, contains more than 76 per cent. of oxide and 23 per cent. of salicylic acid.

The absolutely different proportion of these two compounds ought to give to these two preparations different therapeutic properties.

Vulpian has made use of the commercial salicylate of bismuth containing from 30 to 45 grains of salicylic acid to every three drachms of the salicylate.

Vulpian administers three drachms of the salicylate every 24 hours, dividing this quantity into fractional doses to be given at intervals of an hour or an hour and a half; he has thus obtained a notable lowering of the temperature of from one to three degrees; the stools are disinfected and scanty. In fine, this medicament has had no influence on the march of the disease.

Desplats administers from 75 to 100 grains of salicylate of bismuth in fractional doses of 15 to 30 grains; he has in certain cases observed a veritable abortive action, and the typhoid fever has been arrested in its course. (*a*)

[4] Declat was one of the first to employ phenic acid in typhoid fever; but his observations, having no scientific character, have not been taken into consideration. Stephen Skinner, in 1873; Pecholier, in 1874; and Tempesti, in 1877, have also employed this acid, but in such small doses that its therapeutic effect cannot be appreciated. It was Desplats (de Lille) who first, in 1880, gave the proper rules for the administration of this medicament, and his method has since been adopted by his pupils, Van Oye and Maquart, and by Clodo, at

(*a*) Jaillet, Des salicylates de bismuth (Bull. de thér., t. CV, 15 août 1883, p. 113).—Ragoucy, Sur la composition du salicylate de bismuth (Bull. de thér., t. CV, 15 octobre 1883, p. 328).—Vulpian, Sur des essais de traitement de la fièvre typhoïde au moyen du salicylate de bismuth (Journ. de pharm., 1882).—Rabeau, De la médication salicylée dans la fièvre typhoïde (thèse de Paris, 1882, p. 55).—Henri Desplats, Application du salicylate de bismuth au traitement de la fièvre typhoïde (Soc. de thér., 23 mai 1883, et Journ. des sc. méd. de Lille, 1883).

part I have seen doses of less than half a drachm administered in lavements, produce a fall in the fever of nearly five degrees. Such an antipyretic action is not, however, produced without danger; it is, in fact, accompanied with profuse sweats, pallor of the integument, and often an alarming state of collapse.

Last year (in 1882), I often had recourse to carbolic lavements, and frequently observed pulmonary congestions in patients thus treated; in calling to mind the toxic effects noted in animals poisoned by phenic acid, where these pulmonary congestions are the rule, I attributed to my medication a certain part in the production of these thoracic complications, and discontinued the

Lyons, by Vulpian, Bouchard, Siredey, etc., in Paris. Desplats employs the following method: He makes use of lavements containing from 8 to 15 grains of phenic acid dissolved in a little less than four ounces of water.

These lavements are renewed every three hours, so that from a drachm and a half to two drachms of phenic acid are administered daily; the lavement is given by means of a syringe, and a soft rubber tube carries the liquid high up in the rectum, so that the lavement is sure to be absorbed and retained.

When the patients can take the carbolic acid by mouth, Desplats employs the following lemonade:

Phenic Acid,.....	2 to 4 grammes,
Lemonade [lemon juice and water],.....	100 "
Simple Syrup,..	100 " 150 "

He gives the patient about 100 grammes (about three tablespoonfuls) every three hours, each dose containing about ten grains of phenic acid. This medication is not employed except when the temperature attains or exceeds 104° F.

Claudo employs two lavements a day; one at 8:00 o'clock a. m., and the other at 4:00 o'clock p. m., containing from 15 to 24 grains of phenic acid dissolved in five ounces of water at 68° F. Vulpian made use of phenate of soda, giving as much as 30 grains in lavements.

The dangers of this method were well shown at the time of the discussion which took place before the Société des Hôpitaux, in 1882.

Dreyfus Brissac, Dujardin-Beaumetz and Siredey pointed out the collapse and the pulmonary congestions which accompany the administration of phenic acid, and Siredey has also cited the toxic action of this acid.

Similar facts were given in 1881 at the Biological Society, by Raymond.

In 1881, Glenard considered phenic acid as producing toxic accidents, and that its application to typhoid fever does not lower the rate of mortality. Ramonet also pointed out that among the accidents laid to the charge of the phenic medication, pulmonary congestion is the most frequent and the most formidable.

Desplats has responded to these various objections in replying that phenic acid properly administered does not produce any of these accidents. At the same time he admits that the administration of this acid is not without danger. (*a*)

(*a*) Stephen Skinner, On the Treatment of enteric Fever by use of internal Disinfection (the Pract., september 1873).—Tempesti, Usage de l'acide phénique dans la fièvre typhoïde (lo Sperim., janvier 1877).—Pécholier, Sur les indications du traitment de la fièvre typhoïde par la créosote ou l'acide phénique et les affusions froides (Montpellier méd., juillet 1874, p. 36).—Desplats, Sur l'emploi de l'acide phénique comme agent antipyrétique (Acad. de méd., 1880). De l'acide phénique appliqué au traitement de la fièvre (Journ. des sc. méd. de Lille, 1881). Action comparée de l'acide phénique et du salicylate de soude (Journ. des sc. méd. de Lille, 1882). Traitement de la fièvre typhoïde par l'acide phénique (Bull. de thér , t CIII, 1882, p. 193).—Van Oye, De l'action de l'acide phénique sur les fébricitants (thès de Paris, 1881).—Maquart, Traitement de la fièvre typhoïde par l'acide phénique (thèse de Lille, 1882).—Glénard, Valeur antipyrétique de l'acide phénique dans le traitement de la fièvre typhoïde, acide phénique ou bains froids (Lyon méd., 1881).—Ramonet, De l'action et des règles de la médication phéniquèe dans la fièvre typhoïde (Arch. gén. de méd., 1782).—Siredey, Vulpian et Bouchard; voir Royer, De l'acide phènique et du phénate de soude (thèse de Paris, 1881, et Soc. des hôp., 1882).

employ of these phenic lavements. Since then, at the Medical Society of the Hospitals, at the time of the discussion which followed the report of Ferrand on the method of Desplats, several of our colleagues, and in particular Siredey and Dreyfus Brissac, mentioned similar facts; therefore, gentlemen, while recognizing the powerful antipyretic action of phenic acid, this medication must be considered as dangerous, and when you have recourse to it you cannot exercise too great care and watchfulness. For my part, I think it should be abandoned altogether.

Resorcin has been little used in typhoid fever. You will see, when I come to speak of intermittent fever, that it has been used to advantage in this fever, but although I have made many attempts to introduce this substance into the therapeutics of our country, I have not obtained any very positive effects from it in ileo-typhus. As for kairine, I am not aware of any definite results which have been obtained from it in this disease.

I pass now to the study of germicide medication. You already well know that a great number of antiseptic medicaments have become, by their therapeutic application, antipyretic medicaments; this is what has happened in the case of many substances derived from the aromatic series. It remains for me now to speak of medicaments which, while possessing an evident antiseptic action, have not, at the same time, any effect on the temperature.

It is thus that there have been successively applied to the treatment of typhoid fever, creasote by Pecholier[1] and Morache, iodine and the iodides by Aran, Magonty, and Wilbrand;[2] a combination of iodine and carbolic acid by Roberts Bartholow and James C. Wilson; chlorine and the hypochlorites by

[1] Pecholier, of Montpellier, employs an antizymotic treatment in typhoid fever. This treatment consists in the use of creasote in the dose of 3 to 5 drops, associated with the essence of lemon. He employs also cold affusions, but only to combat the ataxo-adynamic element.

Morache also employed creasote at Val de Grâce, in 1870. He gave from 4 to 8 drops a day. The stools were disinfected, and a thermic depression was noticed. Out of 59 patients affected with typhoid fever, where this method was applied, there were 59 deaths. (*a*)

[2] Sauer proposed, in 1840, to treat typhoid fever with iodide of potassium. Aran, in 1853, employed, in typhoid cases, tincture of iodine, administering daily from 13 to 30 drops.

Magonty, in 1859, and von Wilbrand, in 1866, employed in the treatment of typhoid fever, the iodureted solution of iodine. This solution has the following formula:

Iodide.....	0g.30—(5 grains).
Iodine of potassium	2.00—(30 grains).
Water	10.00—(150 grains).

Dose, 3 or 4 drops every two hours, in a wine-glass of water.

Liebermeister, who has tried this medication, has observed no result, but the mortality was less in patients where this iodo-iodureted solution was employed. (*b*)

(*a*) Pecholier, on the indications of the treatment of typhoid fever by creasote, or phenic acid, or by cold affusions.—(Montpellier méd., July, 1874, p. 36) Morache, on the employment of creasote in typhoid fever.—Gaz. (des hôp., 1871, p. 394.)

(*b*) Aran, on the employment of iodine in typhoid fever (Bulde thér., 1853). Magonty, new treatment of typhoid fever (Paris, 1859). Liebermeister, in Ziemssen's Cyclop. Art, typhoid fever.

Chomel and Beaufort;[3] the sulphites and hyposulphites by Polli;[4] preparations of copper by Burq and Moricourt;[5] mercurial preparations (the black sulphuret) by Serres; and calomel by Wunderlich[6] and Liebermeister, also by Bartholow and Wilson in America. I shall not dwell further on these antiseptic preparations, this medication not being established on a scientific basis; for, if by the introduction of antiseptic substances it has been possible to disinfect the stools, it has been impossible to arrest the course of the disease, that is, to prevent the development and penetration of the micro-organisms into the entire economy.

Regis also employed iodine, both by respiration and by deglutition. He was in the habit of putting in the mouth of the patient pastilles containing from 1 to 2 grains of iodine. These pastilles were not to be chewed. Every hour he gave the following potion:

Tinct. iodine	0g.20 (4 grains).
Syrup	30.00 (℥ j).
Orange-flower water	20.00 (ʒ v).
Peppermint water	60.00 (℥ ij).

[In this country Professor Bartholow has used, apparently with decided success, the following modification of the iodine treatment:

℞	Tinct. iodinii	8.00 c. c. (fl. ʒ ij).
	Acid. carbolic	4.00 c. c. (fl. ʒ j.)

M. Sig. 1 to 3 drops three times a day.

He now gives it every three hours, during the day and night. (Boston Med. and Surg. Journ., Feb. 1, 1883.)]

[3] Chomel has employed, since 1831, the dried hypochlorite of soda, dissolving it in the proportion of about 15 grains to a pint of water. He thus gives his patients daily from 30 grains to a drachm of the salt. He employs, also, lavements containing 15 grains of the hypochlorite. He also wets cataplasms with Labarraque's solution and sprinkles the floor and the bed-clothes with the same.

De Beaufort has employed a solution of hydrochloric acid diluted as lemonade, containing from half a drachm to a drachm of the acid to each quart.

Winter (of Giessen) has employed chlorine and obtained excellent results from it.

[4] Polli employs in typhoid fever sulphites and the hyphosulphites; this medication, according to Murchison, has very doubtful results.

Wilks employs sulphurous acid [giving two to three drachms a day, well diluted], and Meklhausen has obtained success by this same treatment.

[5] Burq has shown, by statistics, that workers in bronze are protected from cholera and typhoid fever. Taking a hint from this, Moricourt has prescribed small doses of ammonio-sulphate of copper by mouth and by lavements.

Burq's prophylactic consists in giving binoxide of copper pills ($\frac{1}{6}$ gr.), and thinks that this preventive treatment is "full of hope." (*a*)

[6] Serres has proposed the treatment of typhoid fever by mercurials. He makes frictions with mercurial ointment over the abdomen, rubbing in 2 to 4 drachms of the ointment per diem, giving also internally a scruple of the black sulphuret of mercury. Grisolle has tried this method, and has found it absolutely inefficacious.

Calomel seems to have given better results than the black sulphide of mercury. Tauff-

(*a*) Burq, on the treatment of cholera by copper (Gaz. des hôp., 1883). Maricourt, treatment of typhoid fever by cupric preparations (Gaz. des hôp., 1882).

Calomel, which terminates this long series of antiseptic medicine, belongs rather to the evacuant than to the parasiticide medication, and will serve as a bond of union between the two. The idea which gave rise to the evacuant medication was perfectly just, especially at the time when this medication was first instituted. In fact, we have seen De Larroque maintain since 1832,[7] that it is in the fecal matters that the septic element of the disease is found, and that it is necessary, in order to prevent the poisoning of the entire organism, to eliminate these septic matters by stool. You have seen that experimental physiology has justified this view of the subject; only, in their haste to eliminate the peccant principle, the founders of the evacuant method have gone a little too far, and have not hesitated to give every day an ounce of castor oil or a bottle of Seidlitz water. Carried to this extreme, the purgative method is rather injurious than useful; it weakens the patient, and, by exaggerating the peristaltic movements of the diseased intestine, it may be the exciting cause of hæmorrhage or of perforation. Utilized in moderation, however, the evacuant method is a serviceable adjuvant to treatment, promoting elimination of putrescent matters.

It remains for me to speak of the tonic and empirical medication. The tonic medication is now universally popular, and in order to repair the incessant losses which the organism undergoes from the exaggerated combustions which the febrile process determines, preparations of quinine have been employed, and, along with suitable alimentation, alcoholic stimulants.[8]

I shall not repeat what I said about alimentation while on the hygienic treatment of typhoid fever, nor shall I dwell further on preparations of bark,

lieb pretends by these medications to have arrested the march of the disease. Wunderlich has also noted a diminution in the duration of the affection under calomel.

Liebermeister has also obtained good results. The latter gives three or four half gramme doses of calomel in the course of 24 hours, at the onset of the disease. He never noticed stomatitis of any gravity. Liebermeister assures us that the mortality is diminished, and the duration abridged by this treatment. (*a*)

[7] Larroque, who in 1839 and 1844, published elaborate treatises on typhoid fever and its treatment, has given the most explicit directions as to the evacuant medication of this disease. His faith in the curative benefit of purgatives was based on this idea that the septic matters contained in the stools, by remaining in the intestine, effect alterations in that viscus and penetrate the organism, poisoning it; and Frémy compared what took place in such cases with what happens in suppurating wounds when in free communication with their septic products. The treatment was as follows:

At the commencement, an emeto-cathartic was given, and every morning the patients took a little Seltzer water, or an ounce of castor oil, or a half drachm dose of calomel. The mortality in these cases was only about ten per cent. Piedagnel (the author of a treatise bearing date of 1835), in employing Larroque's method, had a mortality of 14 per cent., and Andral, of 16 per cent.

[8] It was Graves, Stokes, and especially Todd, who introduced alcohol into the treatment of fevers, and typhoid fever in particular.

Jaccoud administers alcohol in all cases of typhoid fever, prescribing according to the

(*a*) Serres, Du traitement de la fièvre typhoïde par les préparations mercurielles (Acad. des sc., 1847). Wunderlich, De la température dans les maladies, 1872.—Liebermeister, Typhus abdominali in Ziemssen's Handbuch des Allgemeinen therapie, Bd. II, 1874.

only pointing out this fact, that the potions containing the soft extract of cinchona, which are so much administered in these cases, often pass through the alimentary canal without undergoing any modification; and in many instances I have found in the stools of my patients almost the whole of the extract which I had given them. But I must devote a little more time to a consideration of alcohol.

Since the works of Todd in England, and those of my master, Behier, in France, the use of alcohol in this fever has acquired great vogue, and I have already spoken of the advantages and disadvantages of this medication, while on the treatment of pneumonia. In typhoid fever, alcohol does not act as an antipyretic, and if you wish to lower the temperature by this agent, you will have to give such large quantities of it that the treatment will be more dangerous than useful; but, given in proper doses, alcohol acts as a tonic, and, moreover, diminishes that process of denutrition which results from exaggeration of the combustions; this is its great utility.

To those who adopt the opinions of Lallemand, Perrin, and Duroy, it is very difficult to explain this waste-restraining action, because, in their belief, alcohol does not undergo any transformation in the organism. According to the hypothesis which I have defended, and which seems to-day experimentally demonstrated, this kind of effect is quite readily explicable. I maintain, in fact, that alcohol, in presence of oxyhæmoglobin, and by virtue of the feeble

constitution, strength, and habits of the patient, from one to three oz. of rum or of brandy in the form of cordial potion, or of julep, adding 30 to 50 grains of extract of cinchona.

Murchison does not administer alcohol constantly ; he gives with precision the indications and contra indications of this medication, which he formulates in the following way : It is, he says, advantageous to give spirituous liquors to alcoholic subjects early in the disease, and in quantity proportioned to the number of years exceeding forty which the patient may have passed. A quick, soft, compressible, irregular, intermittent, wavy pulse calls for alcohol, whose good effect is seen in slowing and strengthening the pulsations ; if, on the contrary, it accelerates them it does harm.

Alcoholic stimulants should also be given to patients who perspire profusely, and in whom this perspiration does not coincide with amendment of the general symptoms.

In typhoid subjects with dry, brown tongue, it is always indicated, and it may even be given in cases of typhoid fever with delirium, when the delirium is not aggravated under its use. Alcohol is also indicated in the adynamic forms, and in those accompanied with complications.

It should be abstained from in patients below thirty years of age, in patients with dry skin, in cases complicated with delirium, which alcohol is almost sure to augment, especially in noisy, acute delirium, in cases where an intense cephalalgia is observed, with injected eyes and cerebral determinations, lastly, in patients where the urine is scanty, of little density, poor in urea, and rich in albumen.

Fourrier, in a valuable article on typhoid fever in the Bul. gen. de. Ther. for 1873, showed all the advantages to be derived from alcohol in dothinenteritis. According to him, alcohol diminishes the duration of the disease, and acts well in cases where delirium exists. In 1871 Antellet also insisted on the antipyretic action of alcohol in typhoid fever. He maintained that alcohol diminishes the fever and lowers the temperature.(*a*)

(*a*) Jaccoud on the treatment of typhoid fever. Paris, 1873.—Murchison on typhoid fever. London, 1878.—Antellet on the antipyretic action of alcohol in typhoid fever. Paris, 1871.

bond which in this substance unites oxygen to hæmoglobin, appropriates the oxygen, and, transforming this oxyhæmoglobin to reduced hæmoglobin, modifies and arrests in a certain measure the oxidation of the tissues of the economy.

Todd, Murchison, Fourrier, and Autellet have shown us the good effects of the alcoholic medication in typhoid fever. Notwithstanding the advantageous results claimed, I do not believe that we ought, following the example of Jaccoud, to give alcohol to all our typhoid patients indiscriminately; and I believe that it is best to reserve this remedial agent for certain cases which I shall soon have occasion to describe.

By the side of alcohol we should place that triatomic alcohol known under the name of glycerine, which Semmola has administered with good effect in fevers,[1] and which you may utilize advantageously under the form of glycero-tartaric lemonade in your practice.

I shall have finished this long series of medicaments and medications when I have spoken to you of ergot of rye, which is recommended by Duboué.[2] Basing himself on physiological data, very ingenious but rather hypothetical, this authority advances the opinion that the typhoid virus affects particularly the muscular contractility, and especially that of the arterioles, and it is this

[1] Semmola counsels the following formula :

℞	Glycerine	℥ j.
	Citric or tartaric acid	ʒ ss.
	Water	Oi.

M.—Sig. to be used freely as a drink in typhoid fever.

According to Semmola glycerine is a *sparing* medicament (aliment d'épargne), which is very useful in the treatment of severe febrile processes, especially in typhoid fever.(*a*)

[2] Duboué believes that the typhoid poison acts especially as a vaso paralytic ; the poison induces nutritive troubles of the muscular system, but especially of the vascular system, causing diminution of the contractility of the blood vessels. The heart and vessels thus altered cease to functionate, and there results a general stasis, with vascular congestions ; the stasis gives rise to globular alterations, which, in their turn, become toxic agents, and determine other congestions. It is thus that he explains the favorable action of ergot of rye in the treatment of dothinenteritis, ergot being a vaso-constrictor medicament.

This writer recommends always to verify the goodness of the ergot before making use of it ; the grains should be carefully examined, and if eroded or full of holes, or covered with white mould, they should be rejected; the fracture of the grains should be smooth. As for the medium dose, it is from 20 to 50 grains for an adult, and from 8 to 15 grains for children of from 6 to 12 years of age.

You should always commence, unless in very severe cases, with a relatively small dose; the daily quantity should be administered in fractional doses, every three, four, or six hours. The powder may be given in capsules or wafers, each containing from two to six grains; in grave cases it is better to administer this powder in the form of potion.

The effects of ergot medication are very speedy, even in grave cases.

To avoid relapses and sudden death, Duboué recommends the administration of ergot until an advanced period of convalescence, but in feeble doses (eight grains daily in two four-grain doses).

Lardiez, author of a treatise on the use of ergot in typhoid fever, published in 1882, and

(*a*) Semmola on the employment of glycerine in acute fevers. Bul. de Ther., 1883, t. civ., p 481.

paralysis of the vaso-motors which constitutes the essence of typhoid fever. To this want of contractility, he opposes medicaments which have the property of augmenting the tone of the bloodvessels, and, in particular, ergot of rye. The trials which I have made with this treatment have not given any positive results, and I believe that if the spurred rye and its derivations are ever indicated in this disease, it is to combat the intestinal hemorrhages which so often occur.[3]

In this therapeutic arsenal, the richness of which I have already shown you, physicians have chosen arms of various kinds, sometimes a single weapon, sometimes several, with which to fight abdominal typhus, and have thus constituted single medications and complex medications, and, according as they have applied them exclusively to all cases of dothinenteritis, or as they have varied them according to circumstances, they have made thereof exclusive medications, or medications according to the indications. Lastly, another group of physicians have thought that by the unaided efforts of nature, typhoid fever ought to end in recovery, and have applied to the treatment of this disease the doctrine of expectancy. Hence we have these three systems of treatment; exclusive medication, expectancy, and medication according to indications. I cannot too much protest against exclusive medication, whether in typhoid fever or in any other disease. One patient is never just like another patient, and it is absurd to suppose that the practice of medicine can be summed up in a simple breviary, containing, on the one hand the description of the disease, and on the other the therapeutic formula that will cure it. Age, sex, state of the vital forces, the symptomatic aggregate, above all the genius of the epidemic, modify the disease in its totality, and at every step in its evolution.

The science of the physician consists in modifying the treatment according to the divers circumstances, and it is from this fact that results that intimate union which I regard as so indispensable, of clinical medicine and therapeutics. Do you believe that typhoid fever is the same in an infant as in an old person? Do you believe that grave cases can be assimilable to

who has employed the method of Duboué, considers ergot of rye as a powerful means of medication, and of which he has personally seen the beneficial effects. Guichard also considers medication by ergot of rye as of marvellous efficacy.(*a*)

[3] Edwards Duffield has employed in typhoid fever the tincture of dyer's weed (baptisia tinctoria), giving it the dose of two or three drops every two hours. This remedial agent, which he recommends for the more grave cases, has not been employed by other observers. (*b*)

(*a*) Duboué, La physiologie pathologique de la fièvre typhoïde, Paris, 1878.—Des effets comparés des divers traitements de la fièvre typhoïde et de ceux produits en particulier par le seigle ergoté de bonne qualité, Paris, 1883.—Du traitement de la fiévre typhoïde par le seigle ergoté [Acad. de méd., 5 et 12 septembre, 1883].—Lardier [de Rambervillers], De l'emploi de l'ergot de seigle et de ses dérivés dans le traitement de la fièvre typhoïde et du contrôle à exercer sur la bonne qualité de ce médicament [Gaz. hebd. de méd. et chir., 22 décembre, 1882, et 5 janvier, 1883].—Guichard, Concours méd., 21 octobre, 1882, p. 520.

(*b*) Edwards Duffield on baptisia tinctoria in typhoid fever. New York Med. Record, Nov. 1, 1872. [The baptisia tinctoria has long been a favorite remedy in typhoid fever, as well as in septic putrid fevers generally, among the Eclectics of the U.S.] (Tr.)

light cases? Do you believe that benign epidemics are suitable for comparison with malignant epidemics? Do you believe, in a word, that one same therapeutic formula, rigorous and uniform, can be made applicable to all cases indiscriminately, and that we can thus reduce to a common level all forms of the disease?

I know well that the partisans of the exclusive treatment, whether single or complex, pretend to reduce all cases of the disease to one and the same type, but this is only an assumption which is not supported by the facts, and as Professor Vulpian says with so much justice, we have not as yet found a kind of treatment which is sure to modify the march of this disease and arrest its course. There are physicians who pretend to have methods which jugulate typhoid fever; but when we come to examine attentively all the so-called jugulating medications, we perceive that to obtain all the benefits which they promise, they must be applied in the first seven days of the disease, that is to say, in a period in which one is almost sure to confound simple gastro-intestinal irritation (*embarras-gastrique*) with typhoid fever. It is these same physicians who have called to the support of their doctrine of jugulation, the mild forms of typhoid fever described by Jules Guerin, and which the Germans have treated under the name of typhus-levissimus, and in which one sees the malady undergo its evolution in from twelve to fifteen days; but these are natural forms of the disease and not the result of modification by therapeutic means.

There is no such thing in existence as expectancy, properly so-called, applied as a medical or therapeutical system, for physicians who boast of employing this method take all due pains, nevertheless, to surround the patient with all the hygienic care which his situation demands, and to attend to the hygiene of your patient is not to deprive him of therapeutic aid, but to render him excellent therapeutic service. But often these hygienic attentions are insufficient, and more active intervention is required, and you must then resort *secundum artem* to the medication according to indications which I have styled armed expectancy. This expression, *armed expectancy*, has given rise to much criticism. Germain Sée has condemned it as "revolutionary." I do not consider that it has this significance, and if our interference is demanded, it is not to effect any violent changes in the economy, but to calm and regulate the disorders there going on; it is then rather as conservators than as radical innovators that we act.

But, you may ask, what are the rules of this "intervention?" On what manifestations do you depend when you decide on the advisability of more active therapeutic endeavors? These three points should guide you, gentlemen: the intensity of the fever, the general state of the patient, the complications which arise; and, to set forth with more method these three points, we will in imagination take a case of typhoid fever, and follow it through the various phases of its evolution.

Your first care will be, as soon as you suspect typhoid fever, to surround your patient with all the hygienic precautions which I have above enumerated; you take the temperature twice a day, at precisely eight o'clock in the morning and five in the afternoon. Although the rectal temperature is always prefer-