6. *Lymphatic System.*—Iodine, bromine, mercury, and the alkalis, are presumed to increase the activity of the lymphatic system.

7. *Muscular System.*—The tone of this system is promoted by cinchona. Strychnia convulses, conia paralyses the muscles.

8. *Sexual System.*—The sexual feelings are supposed to be excited by phosphorus. The catamenial discharge is promoted by emmenagogues. Parturition is assisted by ergot of rye.

9. *The Urinary organs.*—Diuretics increase the secretion of urine. Alkalis and acids alter the qualities of this fluid. Opium diminishes the contractility of the ureters and bladder. Cantharides irritate the bladder. The oleo-resins affect the urethra, and cure blennorrhagia.

8. *Of the nature or quality of the actions induced by Medicines.*

Medicinal agents may increase, diminish, or alter the vital actions, and, consequently, may be arranged in the three classes of stimulants, contra-stimulants or sedatives, and alteratives.

a. Stimulants.—In a therapeutic sense, says Müller, (*op. cit.* p. 62,) a stimulant is an agent which vivifies the organs, and renovates their composition. "Besides the vital stimuli before alluded to, there are other agents which, under certain conditions, exert a local, vivifying, and strengthening influence: they produce this effect by restoring the composition of the organ by their ponderable or imponderable influence, or by so changing its composition that the renovation by the general vital stimuli is facilitated. All this, however, depends on the state of the diseased organ; and the cases in which the so-called stimulant and tonic remedies have really their supposed effect, are very rare."

Many other agents are called stimulants, although they have no renovating influence, and do not vivify except by exciting re-action, and which, by long-continued operation, destroy, instead of restoring, the powers of the system.

b. Contra-stimulants, or sedatives.—These are agents whose action is the reverse of that of stimulants.

c. Alteratives.—These are neither stimulants nor contra-stimulants merely. They produce some unnatural or morbid change in the organic textures, and consequently occasion alteration of function. This class includes nearly the whole of the articles comprising our materia medica.

Brunonian theory.—The theory of Dr. John Brown supposes that all living beings possess a peculiar principle, termed *excitability*, and which distinguishes them from inanimate bodies. The agents which support life are termed *exciting powers;* and these acting upon the *excitability*, maintain life; in the language of Brown, produce *excitement*. Whatever can modify the excitability, and produce a greater or less degree of excitement, are termed *stimulant powers:* these are either universal or local. When the exciting powers act moderately, *health* is produced: when they act with too great energy, they cause *indirect debility:* when with too little, they produce *direct debility*. According to this doctrine, all medicines are stimulants, and differ from each other in little more than the degree in which they exert their stimulant power: moreover, they cannot cause exhaustion (of the excitability) except by an excessive action; in other words, by producing previous over-excitement.—(*The Works of Dr. John Brown*, by Dr. W. C. Brown, 1804.)

Considered in a therapeutical point of view merely, the following objections present themselves to this theory:—1. Many agents produce exhaustion without previously occasioning any obvious over-excitement (as the respiration of sulphuretted hydrogen or hydrocyanic acid gases):—2. Medicines differ from each other in something more than the degree of their power; compare together foxglove, ammonia, hydrocyanic acid, cinchona, mercury, alcohol, elaterium, and opium:—3. The great majority of our medicines act neither as stimulants nor sedatives merely; they alter the quality of the vital actions: and this alterative effect has been quite overlooked by the Brunonians.

Theory of Contra-stimulus—New Italian doctrine.—This theory may be considered as a modification of the preceding. It was founded about the commencement of the present century, principally by Rasori and Borda, and was subsequently adopted by Tommasini and other Italians.

It admits two classes of medicines, *stimulants* and *contra-stimulants*, thus obviating one of the objections to the doctrine of Brown. An agent that counteracts the effects of some well-known and well-characterized stimulant is denominated a contra-stimulant. The following is a list of remedies classified according to these principles:—

Stimulants.		*Contra-stimulants.*	
Caloric.	Carbonic acid.	Cold.	Nux vomica.
Opium.	The electric fluid.	Blood-letting.	Valerian.
Musk.	Aromatics.	Metallic medicines.	Coffee.
Camphor.	Cinchona (by some this is regarded as contra-stimulant.)	Emollients.	Mustard and pepper.
Phosphorus.		Tonics.	Cantharides.
Ether.		Ipecacuanha.	Turpentine.
Ammonia.	Red particles of the blood.	Purgatives.	Squills.
Wine.		Hydrocyanic acid.	Nitrate of potash.
Alcohol.	Animal food.	Digitalis, belladonna, stramonium, *Lactuca virosa*, &c.	Acids and oxygen.

It will be perceived that the founders of this doctrine have assembled, under the same head, agents causing the most opposite effects: for example, animal food and opium, aromatics and alcohol, cold and turpentine, hydrocyanic acid and cantharides. Moreover, they have separated others whose general operation is very analogous;—as musk and valerian; opium and *Lactuca virosa;* aromatics and pepper. In their anxiety to find stimulants and contra-stimulants, they have quite overlooked the large and important class of alteratives. They have taken no notice of the physiological effects of medicines, but have directed their whole attention to curative influences, which are accidental and uncertain: for the agents which they have collected under the head of contra-stimulants do not always, or even frequently, relieve excitement; on the contrary, they often have the reverse effect.

There is one part of the theory that deserves especial notice. It is asserted that the dose of a contra-stimulant should be proportioned to the degree of excitement; for when the inflammatory action runs high, the patient will bear enormous doses without any obvious evacuation from the skin, stomach, or bowels, and the disease will be subdued wholly by the contra-stimulant effect upon the fibres and other solids of the body. This capability of bearing large doses has been termed *tolerance* of medicines;—and, of course, if the theory be true, ought to decrease as the disease

declines; but this certainly does not generally hold good with respect to emetic tartar, as will be mentioned hereafter. Dr. Marshall Hall (*Researches relative to the Morbid and Curative Effects of Loss of Blood*, 1830, also, *Introductory Lecture*, 1834,) maintains, that while a man in health can lose a given quantity of blood (say ℥xv.) without fainting, the same individual, affected with congestion of the brain or inflammation, can bear a much larger quantity (as from ℥xxx. to ℥l.) before incipient syncope,—while in fever, intestinal irritation, dyspepsia, or cholera, a smaller quantity (as from ʒvi. to ʒxii.) will occasion fainting:—so that congestion and inflammation augment, while fever, cholera, &c. diminish the tolerance of blood-letting; he therefore makes use of this circumstance as a diagnostic to enable him to distinguish irritation from inflammation.

9. *Circumstances which modify the effects of Medicines.*

The circumstances which modify the effects of medicines may be arranged under two heads; those relating to the medicine, and those relating to the organism.

1. Relating to the Medicine.—Under this head are included,—

a. State of Aggregation.—The state of aggregation of a medicine modifies the effect. Thus morphia is more active in solution than in the solid state.

b. Chemical combination.—The soluble salts of the vegetable alkalis are more active than the uncombined alkalis, and *vice versâ*, the insoluble salts are less active. Lead and baryta are rendered inert by combination with sulphuric acid.

c. Pharmaceutical mixture.—The modifications produced by medicinal combinations have been very ably described by Dr. Paris.—(*Pharmacologia*, 6th ed. vol. i. p. 267.) The objects to be obtained, he observes, by mixing and combining medicinal substances, are the following:—

I. *To promote the action of the basis or principal medicine:*—

A. By combining together several forms or preparations of the same substance: as when we conjoin the tincture, decoction, and extract of cinchona in one formula.

B. By combining the basis with substances which are of the same nature, that is, which are individually capable of producing the same effect, but with less energy than when in combination with each other: as when we prescribe a compound of cassia pulp and manna.

C. By combining the basis with substances of a different value, and which do not exert any chemical influence upon it, but are found, by experience, to be capable of rendering the stomach, or system, or any particular organ, more susceptible of its action: as when we combine mercury with antimony and opium, to increase the activity of the former.

II. *To correct the operation of the basis, by obviating any unpleasant effects it might be likely to occasion, and which would pervert its intended action, and defeat the objects of its exhibition.*

A. By mechanically separating, or chemically neutralizing, the offending ingredient; as by digesting *Cetraria Islandica* in an alkaline solution, in order to remove the bitter principle, and to enable us to obtain a tasteless, but highly nutritious fecula.

B. By adding some substance capable of guarding the stomach or system against its deleterious effects; as when we combine aromatics with drastic purgatives, to correct the griping qualities of the latter;—or opium with mercurials, to prevent the latter affecting the bowels.

III. *To obtain the joint operation of two or more medicines.*

A. By uniting those substances which are calculated to produce the same ultimate results, although by totally different modes of operation: as when we combine