The therapeutic applications of adrenalin are already numerous and new uses for it are constantly found out by investigators. Generally speaking, adrenalin when locally applied is the most powerful astringent and hemostatic known. It is useful in all forms of inflammation and is the strongest stimulant of the heart. It is non-irritating, non-poisonous, non-cumulative and without injurious properties. It has been used with good results in morphin and opium poisoning, in circulatory failure, in the prevention of collapse in anesthesia, and in allied conditions. It is invaluable in carrying out bloodless operations in nose, eye, ear and throat works. It has also given good results in some cases of deafness, hay fever, nasal hemorrhage and various forms of heart disease. Such authorities as Drs. Mayer, Wilson, Bates, Reichert, Ingals, Stucky, Johnson, Chambers, Curtis, Swain and many others have reported very favorable results.

A convenient form to use the adrenalin is in solution of its chlorid one part of adrenalin in one thousand parts of water. It was found desirable to add sodium chlorid to form normal salt solution. In order to insure the stability of the solution, one-half per cent. of chloroform-acetone or chloretone is added with advantage.

Adrenalin can be made in the form of tablets, usually tartrate. The tablet may be made with sodium chlorid and chloretone, so that when it is dissolved in a known quantity of water it forms a solution of desired strength.

The therapeutic efficacy of adrenalin has already been established beyond doubt, and it will unquestionably obtain a prominent place in the *materia medica*.

In concluding this paper, I desire to state that my thanks are due to Dr. E. M. Houghton, of Detroit, for making the physiological test, and also my thanks and large share of credit are due to Mr. Wooyenaka, my associate, for his energetic and able assistance in accomplishing this interesting investigation.

475 Central Park West.

NEGLECTED, BUT VALUABLE THERAPEUTIC MEASURES.*

GEORGE F. BUTLER, M.D.

Professor of *Materia Medica* and Therapeutics College of Physicians and Surgeons, Chicago, and Medical Superintendent, Alma Sanitarium, Alma, Mich.

ALMA, MICH.

In medicine the law of action and reaction is peculiarly evident in therapeutics. Remedies arise, are boomed and disappear. Some markedly efficient are flung into the background, not because of lack of value, but because of popular prejudice arising in the minds of neuropaths and for commercial reasons affecting physicians. The influence of sects in medicine in this particular is much less than is usually assumed. Sects based on opposition to any therapeutic procedure are expressions of the opinion of neuropaths rather than their cause. Such sects notoriously long retain primitive therapeutic procedures which the profession has outgrown.

Hahnemannism retains the skatologic procedures which the profession long ago rejected with disgust. Thus a Boston homeopathic firm issues a price-list of so-called animal remedies. This offers for sale at a fixed price, on page 20, potentized *pediculi pubis*, *pediculi capitis* and *pediculi corporis*. "Culture" would seem

to have something to do with the last mentioned, for their Bostonian origin is especially dwelt upon. Page 1 offers the "acarus scabies" or "lice insect;" page 15 offers "lachryma filiae" or "tears from a young girl in great suffering;" "carbunculus of the neck very severe" is tendered as a remedy on page 6, and page 7, in addition to the lice insect, offers *adenia* from the glands in Hodgkin's disease, the *ailanthus* "bug" and "albuminuria" or "renal albumin." "Fel gryllus Americana" or "Brazilian cricket" is offered on page 11 as a remedy for "suppression of urine." Page 2 offers "anthracin" or pus from an anthra. Page 4 offers "buboin" or pus from "syphilitic bubo." Page 5 offers "calcarea or stone of the kidney, bladder and lungs." Intestinal bladder and nose catarrh are offered on page 6. Page 7 offers a preparation of "chancre of syphilis." Page 8 offers "colostrum;" page 9, "crotalin" from the rattlesnake, as well as "diabetes mellitus" and "dropsy-semen." Cancer of the uterus, bowel, face and breast are also offered; as is also "hippозinine" from glands, "lyssin" from hydrophobia, "osteonecrosis" pus from rectal abscess, from "caries of heel" and from septic abscess. "Electricitas" or electricity; "galvanismus" or galvanism; rubrum, flava and ceruli irides, or the red, yellow and blue rays of the spectrum, as well as "Luna" or moonshine, are also tendered as therapeutic aids to the enthusiastic Hahnemannian.

Together with these fetichistic absurdities, Hahnemannism long retained the general therapeutic procedures of the period in which it was born. Although Hahnemann claimed that the homeopathist dispensed with the necessity of employing the barbarous practice of blood-letting¹, he asserted that beginners and learners may be pardoned for using depleting processes; but if they dare to pride themselves on their pretended improvements and promulgate blood-letting and cupping as processes that are eminently homeopathic, then they make themselves ridiculous, and they ought to be pitied for their dabbling and for their bungling blindness which inflict suffering on their patients. It is laziness or a foolish predilection for the pernicious routine of allopathy, which prevents them from making themselves acquainted with the true homeopathic remedy.

This is the old story of the modern "go-as-you-please" homeopathist, who uses pellets in conjunction with ordinary medicine, but refers the cure to the pellets. The New York homeopathists adopted this system. Dr. Gray, one of the leaders, remarks²: "Blood-letting I have not ceased to employ during the eighteen years of my acquaintance with homeopathy. At first, by advice of my learned and lamented predecessor, Dr. Gram, it was continued on purely empirical grounds, but now, and for many years past, I apply it upon the homeopathic basis, having acquired, partly by experiment, partly by reading allopathic authorities to that end, a tolerable pathogenesis of it."

The disuse of blood-letting was simply a consequence of the pandering to popular prejudices for commercial reasons. The persons who had abused venesection joined loudest in the outcry against it. Despite prejudice, based on the fetichistic notion that the life is the blood and allied cant of the followers of Hahnemann and Thompson, blood-letting has held its own, in certain departments of medicine; with the growing knowledge of biochemistry, especially as involved in the blood serum, it is again beginning to assume its old place in

* Read at the Fifty-second Annual Meeting of the American Medical Association, in the Section on *Materia Medica*, Pharmacy and Therapeutics, and approved for publication by the Executive Committee: Drs. Thomas Hunt Stucky, Leon L. Solomon and N. S. Davis, Jr.

1. Chronic Disease, vol. vi, p. 177.

2. Homeopathic Examiner, vol. iv, 1845.

therapy. The former claim that blood-letting would quickest remove toxic products from the body, which could then be replaced with watery solutions similar to blood serum, is now strongly corroborated by the results obtained through the use of the normal salt solution.

Through the influence of the surgical operation *per se*, it was very emphatically pointed out some years ago by J. Williams White, Philadelphia, that but little use of this knowledge has been made. The principal use which emphasizes study of its limitations and indications has been the improvement of peritoneal tuberculosis under simple abdominal section. The rationale of this improvement is readily grasped when the fact is remembered that leucocytes are drawn toward the peritoneum by such an operation, and this would have a profound influence on the general circulation. In consequence of this, too, the leucocytes would be peculiarly stimulated toward phagocytic action in the peritoneum.

For a long time alienists have observed that traumatism exercises a beneficial influence (too frequently but brief in duration, but none the less patent) on chronic forms of insanity. Dements who have accidentally fractured a limb have been noted to improve during the period of recovery and for some time thereafter, when relapse usually takes place. In acute types recovery under these conditions is often permanent. It has also been noted that in families where idiots abound, skull fracture in infancy has led to the disappearance of the idiocy in the victim of the fracture, who, not only becomes sane, but may manifest a high order of intellect. The Australian novelist, Clarke, when a child, had a skull fracture. This was also the case with Vico, Gratry, Fusinieri, Clement VI, Malebranche and Cornelius. To skull fracture in the last three was due, as Lombroso has shown, their genius. I cite the facts simply to show that in the much neglected therapeutic procedure of counter-irritations there are therapeutic possibilities far from being realized. These procedures have fallen into disuse not because of their lack of value, but because of a popular desire for cosmetic therapy.

In no small degree, also, has this desire led to the separation of balneotherapy and hydrotherapy from pharmacotherapy. On principles whose validity is thoroughly recognized, infusions were at one time largely given in connection and coincident with baths. Clinical observation leaves no doubt that this conjunction of therapeutic measures had decidedly beneficial effects. The use of water as an alterative is now more generally recognized than at any other time, yet its employment as an adjuvant because of its alterative qualities, was never more neglected than at present. At the beginning of the century, as the American Dispensary shows, the Brandt treatment of typhoid by balneotherapy was successfully used in the United States. From a survival of the Brandt treatment came the Kibbee treatment of yellow fever, which gave undeniably good results in the late seventies.

These early observers recognized not only the influence of balneotherapy and hydrotherapy *per se*, but the influence of these in extending and increasing the field and effect of pharmacotherapy. Homeopathy, distorting the essential element of the therapeutic procedure, caused its disuse. The dilution absurdity of high potency homeopathy destroyed faith in it among the scientists, at the same time creating prejudice against the correct application of the principle among laymen. The value of the principle, however, was fully sustained by the results obtained at mineral springs, but these were ascribed to the chemical constituents of the water. While, as in

the case of the Hot Springs in the treatment of syphilis, evil has been wrought, it has been wrought by the reliance on the balneotherapy alone, to the neglect of other therapeutic agents as co-adjuvants. The value of these procedures when conjoined has been fully demonstrated by their use in auto-toxemias with neurasthenic elements, whether complicated by the drug habit or not. Here the use of the drip sheet, of the cold pack, of cold sponging, of the greatly diluted medicinal agent, entailing free use of water, have been fully demonstrated to be of great value. The older surgeons, before the days of anesthesia, relieved the patient's system from strain and prepared it to stand the shock of operations by these conjoined procedures. Bleeding was usually added for this purpose. Nerve strain and worry mean increased toxic products to be eliminated, and mean at the same time deficient powers of elimination. Both these conditions indicate, therefore, free uses of water, and also, that watery solutions of medicinal agents are to be employed here.

The use of compound prescription, too frequently confounded with its exact object, the shotgun has lessened since the absurdities of this last were pointed out, and since homeopathy has made the single remedy a popular shibboleth. To some extent this principle is observed in anesthesia and also in certain uses of atropin and morphin. As I pointed out some years ago, this principle could be further extended. Many prescriptions of the older clinicians contained remedies so carefully combined as to emphasize certain common properties and destroy properties antagonistic to them. These were unjustly confused with the shotgun, which was simply a blind firing in the dark, in the hope of, by a scattering fire, hitting something. In fecal anemia, for example, combinations of iron and the salines have been found to act well in conjunction with the vegetable bitters, despite the fact that these are ordinarily given to counteract each other. Sir Andrew Clarke had a favorite mixture for this purpose of the following composition: Iron sulphate, gr. xxiv; magnesia sulphate, dr. vii; aromatic sulphuric acid, dr. vi; tincture of ginger, dr. ii, and infusion of quassia, dr. xvi.

While this has been criticised as a shotgun procedure, it was, for reasons already cited, in connection with hydrotherapy, fully adapted to secure free elimination and the extended action of medicinal agents. It also met the objections to the inorganic iron compounds; another factor in its favor was the failure to arouse mental antagonism to the remedy. This antagonism is more frequently awakened by the palatability of a remedy than by its reverse, and, as states of worry increase auto-toxemia, a remedy which arouses this mental antagonism creates worry and increases auto-toxemia.

The combination just cited from Sir Andrew Clarke is one of a type in which remedies are so combined as to produce an alterative action, which increases metabolism, thereby enhancing the assimilation and benefit of a restorative agent. The physiologic conditions implied even in health by assimilation include the necessary element of elimination of toxic products.

The failure to recognize this has been the reason why iron has so often failed completely in anemia. The success of iron, quinin and strychnin when combined have been due to the recognition of this principle. The same is true of the success of the combination of certain heart tonics and alteratives, which have produced an effect where the simple heart tonics by themselves have failed. The fact has been fully demonstrated that disorders of

the heart do not depend so much on organic lesions as upon the lack of compensation. Even angina pectoris produces sclerosis of the coronary arteries so often associated with it and is not, as a rule, produced by this. The products of auto-toxemia, like toxins of the germ diseases, produce sclerosis. This auto-toxemia may be of local origin, due entirely to the failure to eliminate the toxic results of nerve stress.

Arrhythmia, bradycardia and tachycardia are cardiac manifestations dependent, as Dr. G. Jacoby pointed out years ago, on disturbance of cardiac innervation with interdependent auto-toxemia. Arrhythmia is often a pure neurosis, resulting from toxemia. It is very frequently found in auto-toxemias, where there is a condition of sexual erethism which itself depends on auto-toxemia. The same is true of bradycardia and tachycardia. So long as these so continue that repair out-balances waste, the condition is not dependent on more than biochemic conditions, but when waste exceeds repair organic disease often results.

Because of this mixture of auto-toxemia and disturbed cardio-nervous action, two requirements must be met: 1, the elimination of toxic products by alterative, and 2, the control and stimulation of the local cardiac ganglia, as well as of the cardio-respiratory centers in the medulla. This is but one of a hundred combinations which might be met by careful union of medicinal agents indicated by the patho-physiologic state.

A neglected but valuable alterative nervin is copper. The therapeutists of the close of the eighteenth century believed that copper was of peculiar value in nervous diseases, where an alterative was needed as in chlorosis and anemia, and where neither iron nor arsenic was beneficial. The action of copper on the eye structures indicates that this alleged alterative action had a foundation in fact. It is a normal constituent of the blood and its toxicity has been enormously overestimated. All the therapeutists of the English-speaking countries agree as to its value as an alterative nervin. It has been found of value in all adynamic states by the French therapeutists. Among the combinations peculiarly useful are copper arsenite and copper phosphate.

Massage has undergone the usual variations of trite and useful procedures. The tendency to fashion and fads in therapy, arising from the advertising desire of fashionable physicians, has led more than once during the last two centuries to the disuse and abuse of massage, and has opened a way for the old bone-setters, who are now called osteopaths. Two decades ago they were denominated in Illinois snapping doctors. Massage has also lost caste through the erotic results of misapplication. During the last two decades of the nineteenth century massage shops, as they were called, abounded in all great cities; they received extensive advertisement in quasi reputable newspapers and created a serious prejudice against massage, of which prejudice the osteopaths have largely availed themselves. The old action of massage, as a stimulant to exercise and tissue change, however, has received constant proof sufficient to remove all prejudices against massage in the mind of the scientific therapeutist. In most of the morbid states where exercise is needed, the initial volition of the resolve to take exercise is so fatiguing that all the good effects of the subsequent exercise are nullified. Here massage peculiarly fits the case, and starts the patient on the road to recovery through the physiologic rest it gives by local physiologic exercise and fatigue, without undue strain on a weak will-balance. The Swedish movement

cure is, however, contra-indicated in these cases by its mental effect on the patient, as well as its tendency to produce exhaustion. Both Swedish movement and massage in the hands of a masseur who believes in their occult origin are very dangerous, since mental suggestion of a hypnotic type is apt to affect the patient unfavorably. The most material explanation of their physiologic action should be given their patient, before they are employed, in order to avoid this untoward effect. The addition of massage and Swedish movement to the other measures employed in tabes dorsalis has peculiarly beneficial results, both from a physical and mental standpoint, since the patient learns thereby the amount of strength and motor power that he retains despite its seeming loss. Massage in sexual neurasthenic cases, while beneficial, should be carefully watched, since in this class of subjects, whether male or female, pervert tendencies are easily initiated. In all forms of chlorosis and anemia, a sluggish metabolism may be stimulated by massage as well as establishing the initial improvement in auto-intoxication. It should be remembered that in these last states, from neurotrophic causes the skin readily bruises, but such bruises from massage are of short duration, and rapidly disappear under the improvement effected by the procedure.

TUBERCULOSIS IN STATE INSTITUTIONS.*

H. M. BRACKEN, M.D.

Secretary Minnesota State Board of Health; Professor of Materia Medica and Therapeutics, University of Minnesota.
MINNEAPOLIS, MINN.

It will be impossible for me to give statistics bearing upon this disease, or to discuss the different methods in vogue in the various states in dealing with it. Such a course is not necessary however. It should be our purpose at the present time to discuss what seem to us the most approved methods, leaving the question as to what is actually done for consideration later. The institutions under the control of the state which demand our attention are schools, hospitals, reformatories and prisons, although we might well go further and discuss conditions in factories, workshops, stores, tenement-houses, etc.

EDUCATIONAL INSTITUTIONS.

Of schools there are the following: Those for children, either public or private or parochial; and the academies and colleges. Every one will concede, I presume, that tuberculous children should be excluded from the public or parochial schools for at least two reasons: 1, in order to prevent the infection of other children, for in these places the dangers of spreading infection by means of non-disinfected sputum through the use of common drinking cups, text-books, etc., is great; 2, for the good of the tuberculous child itself, for it is not good that these should be housed and cared for in the same manner as are the healthy children.

Tuberculous children should have fewer hours of study. They should have well-regulated physical exercise; especial precautions should be taken to protect them from inclement weather, wet clothing or other conditions tending to irritate the respiratory tract. Undoubtedly some one will say that these children should not be in school at all. It is hardly advisable to take such an extreme position, for many tuberculous children will, if properly cared for, overcome the disease

* Read at the Fifty-second Annual Meeting of the American Medical Association, in the Section on Hygiene and Sanitary Science, and approved for publication by the Executive Committee.