

fore, seem to me to have positive bases. For a convalescent woman to do her hair in bed is a muscular work a hundred times less than that done by the subject of my experiments. Nevertheless, it causes in her a degree of fatigue which may induce syncope; it causes as a rule an attack of fever with a rise of 1° , either because her nervous system has been too weak to moderate the chemical processes which during muscular contraction generate heat, or because it has been unable to adjust the working of the heat-losing apparatus to the amount of heat produced.

THE EFFECT OF FOOD ON TEMPERATURE.

It is still more difficult to determine in the healthy man the reality of the thermogenic effect of meals. This action is not denied; if oxygen takes part in the production of heat there is no doubt that the food, directly or indirectly, supplies the combustible element. It is also known that the working of the digestive and salivary glands and of the liver is a source of heat. But the production of heat is one thing, rise of temperature is another. Under conditions of health and moderate feeding no marked rise of the central temperature is observed in a man after a meal. Under normal conditions an animal, to keep itself at a constant temperature, constantly destroys matter, first the food in the form of circulating material, next its reserves, and in case of need the substance of its cells.

The supply of fuel, however, is intermittent, and it does not burn as soon as it is introduced; one part of it serves for the repair of the cells, one reconstitutes the reserves, only one part burns as soon as absorption allows. Thus the reserves are spared, and the cells protected.

THE FEVER OF INDIGESTION.

But when too much food has been taken, or when the digestive process is sluggish, a meal is followed by a rise of temperature either owing to greater energy of glandular activity, or to an influence exerted on the nervous system by products of imperfect digestion; this is the fever of indigestion, the fever of the dyspeptic. This dyspeptic fever is a reality; the flushing of the face, the dyspnoea, the excessive acceleration of the pulse are simply the results of reflexes set up by the contact of too large a mass of food with the normal mucous membrane of the stomach, or of a normal mass with an excitable mucous membrane—this is the syndrome of a true fever, with elevation of the central temperature. I have seen this temperature rise to 39.4° . As owing to the periodicity of meals these attacks are also periodic, I have seen such fevers treated with quinine. These fevers, which are not rare in adults, are frequent in children.

When the weakness of a long illness or of convalescence has caused the digestive canal to lose its functional energy, the first meal or meals disproportionate to the patient's strength induce febrile attacks, which must not be attributed to a relapse or to recrudescence of the disease.

EFFECT OF INTELLECTUAL WORK ON THE TEMPERATURE.

I in nowise call in question the experiments which prove that intellectual work produces heating of the nervous system, but what does not appear to me to be demonstrated is that this heating causes a rise of temperature of the whole body. The muscles, which in the whole of the body represent a mass twenty-four times greater than that of the brain, may well, in becoming heated by work, heat the whole body. After five minutes of work the temperature of a muscle rises one degree. The temperature of the brain does not by intellectual work rise by one degree either in five minutes or in an hour. It does not rise during that time by 0.4° , since when the body rises in temperature to that extent above its normal standard sweating commences; and sweating is only exceptionally the result of intellectual work. But cerebral activity may, when it takes place, go beyond the intellectual zones, and reach the thermic zones. Fever might then be produced by an action on the nutrition of the whole body. This elevation of the temperature by intellectual work, which is not very evident or even doubtful in the case of normal man, is certain in persons who are ill.

EFFECT OF EMOTIONS ON THE TEMPERATURE.

All clinicians know that in the febrile state, or during con-

valescence, talking, reading, or attending to business may be a cause of recrudescence or return of fever. Emotions—particularly disagreeable emotions—discussions, anger, moral resistance, cause febrile attacks in debilitated persons. In the treatment of typhoid fever I have given nearly 60,000 cooling baths. These baths, the initial temperature of which is only two degrees lower than that of the rectum, are cooled by one degree every ten minutes down to 30° ; they lower the temperature from half a degree to one degree, sometimes three degrees. In some cases the temperature remains stationary; it may even rise. With very few exceptions these elevations of temperature in the cooling bath have been noticed only in women who were refractory to treatment, who refused the baths, and only submitted thereto on compulsion.

These facts, which may elucidate one side of what is called "hysterical fever," have nothing to do with auto-suggestion. They are the effect of struggle and nervous fatigue. As in the case of fever from muscular work, they show that if a robust nervous system can protect the economy against variations of temperature, nervous debility makes this protection less vigilant and less effectual. One can then see, as with a magnifying glass, effects which are but slightly visible in the normal state. The causes, the reality of which is called in question, then produce effects which are clearly manifest. The weakened nervous system is a reagent peculiarly sensitive to the action of the factors which produce fever.

AN ADDRESS

ON THE

RELATION OF CHEMISTRY TO PHARMACOTHERAPY AND MATERIA MEDICA.

Delivered before a General Meeting of the XIIth International Medical Congress, held in Rome, 1894.

By PROFESSOR STOKVIS,
Amsterdam.

[ABSTRACT.]

In the course of his address Professor Stokvis observed that the progress recently achieved by chemistry, especially by its newest department, theoretical chemistry, was of the greatest importance to pharmacotherapeutics. The experiments of Raoul Pictet and others had shown beyond reasonable doubt that two most indispensable conditions of life, warmth and water, were also conditions *sine qua non* for all chemical phenomena. Life, however, was not a mere chemical function; rather chemical action was in itself a kind of molecular life. The influence of infinitesimally minute quantities of medicinal and toxic substances in cell life, the varying reaction of different cells of the living organism in the presence of different chemical substances, the fact that some perfectly insoluble substances exercised an influence upon the organism, the fact that the same substance could act as a stimulant or as a depressant according to the dose, and, finally, the fact that neutral solutions of certain salts (iodides and bromides) produced effects which must be attributed to free molecules (of iodine and bromine) were all phenomena which, up to the present time, it had been sought to explain by the theory that the cell possessed inherently a certain quantity of vital energy.

Theoretical chemistry taught that the same phenomena occurred in organic chemistry whenever a solution was made, and had propounded the new theory that the solution of any substance was due to the continuous action of chemical molecules endowed with kinetic, osmotic, and electrolytic properties directly proportional to their molecular weights (Van t'Hoff and Arrhenius), a conception which explained perfectly well all the facts which he had enumerated. It explained also, not only the diuretic and purgative action of salts (H. de Kries, Hofmeister, Wladinadski), but, further, taught that the catalytic or fermentative processes also belonged to the domain of inorganic chemistry. The systematic application of the new method to physico-chemical

investigations furnished further results of great importance concerning the physiological action of drugs.

Chemistry was not less important when considered in relation to *materia medica*. With regard to the alkaloids and other chemical compounds derived from the vegetable kingdom, it was desirable to insist on the fact that crystallisation was a phenomenon which belonged to the domain of inorganic chemistry. It was an error to suppose that the occurrence of crystallisation was a proof of the organic purity of a substance. By adopting this erroneous view, and by denying the fundamental therapeutic principle that two substances administered together might have an effect quite different from that of either administered separately, the dosimetric system of medicine had condemned itself.

Professor Stovkis then drew attention to the importance of all civilised nations coming to a mutual understanding as to the method of verifying the chemical identity of preparations which bore the same name. Chemistry, he continued, had also rendered important services to *materia medica* by the synthetic formation of new alkaloids and new chemical bodies unknown to our forefathers. Bacteriology also, and biological chemistry were placing at the disposal of medical men preparations derived from microbial cultivations or from the organs of animals. No hesitation had been shown in giving to many of these substances names which indicated the therapeutic purposes which they were supposed to serve, and at the present day the drug market was flooded with new preparations. The blame did not lie on chemistry, nor on bacteriology, nor on biological chemistry, but on medical men, who did not ascertain thoroughly the true principles of the therapeutic art. Clinical therapeutics proved that it was only by prolonged and repeated researches that an opinion could be formed as to the value of a drug, and had proved, too, that these new remedies for the most part were of very secondary importance, or had no value at all. These new substances were recommended on the strength of hasty or imperfect observations. It was as wrong to give up old remedies because they appeared to be antiquated, as to take up new ones merely because they were new. It was dangerous to be carried away by the old maxim of Celsus, *In ancipite morbo plus valet anceps remedium quam nullum*. Prudence should always be observed in the employment of remedies, and it should never be forgotten that the same remedy administered in varying doses and in different manners might produce very different therapeutic effects, as a musician obtained different notes from the same instrument.

Pharmacotherapy and *materia medica* therefore owed much to chemistry, and to theoretical chemistry, which had contributed to explain vital and electrolytic phenomena, and the mention of which brought to mind the imperishable renown of three great Italians—Matteucci, Volta, and Galvani.

PROCEEDINGS OF SECTIONS.

[Specially Reported for the BRITISH MEDICAL JOURNAL.]

SECTION OF INTERNAL MEDICINE.

Saturday, March 31st.

SPREAD OF INFECTIVE DISEASES.

DR. REGER (Hanover) read a paper upon the way in which infective diseases are spread, in which he stated that in his opinion the micro-organism of a disease produces effects only when it is mature, and that the breaking out of the malady and the migration of germs to other people take place at the same time, the periods of incubation and of desquamation not being contagious. He supported his conclusions by a very elaborate series of statistical tables.

EFFECTS OF REMOVAL OF LIVER FROM THE CIRCULATION.

Professor QUEIROLO (Pisa) showed several *post-mortem* specimens from animals in which he had removed the liver from the circulation by uniting the portal vein with the vena cava inferior. He described his method of operating, and gave a brief review of the results he had obtained.

Drs. RUMMO and ALBERTONI criticised Professor Queirolo's methods and results, and Professor BAÜMLER (Freiburg) con-

sidered that the toxins, not being eliminated by the liver, would be sure to produce diarrhoea.

Dr. G. ZAGARI (Naples) stated that as the results of his experiments he had come to the conclusion that the liver had important functions in the destruction and elimination of toxins and of bacteria.

INJECTIONS OF YEAST.

Dr. DE BACKER (Paris) communicated the results of an extensive series of observations upon the injection of sterilised cultures of yeast in the treatment of certain infectious diseases, especially tuberculous affections, and stated that this method of treatment had in his hands been most successful.

MISCELLANEOUS.

Dr. MENDIZABAL read a paper on influenza, in which he discussed the most important clinical varieties.

Dr. SZILLAI read a paper in which he stated that he had obtained good results by the treatment of croup with hydrochlorate of pilocarpin.

Monday, April 2nd.

DIAGNOSIS AND TREATMENT OF TUBERCULOSIS.

The work of the Section commenced with a paper by Dr. REVILLIOD (Geneva), in which he drew attention to the great frequency of phthisis in men, and of the large number of cases in which an apparently complete cure occurs.

Dr. S. BERNHEIM (Paris) read a paper in which he stated that immunised serum had a specific vaccinal action against tuberculous diseases.

Dr. S. LAACHE (Christiania) strongly advocated the early resection of a rib in empyæma; and Professor BAÜMLER (Freiburg) advocated early aspiration of the chest, and, if necessary, resection of a rib in empyæma in tuberculous patients.

Dr. O. SCHRÖN (Naples) read three papers, in the first of which he described and pointed out the diagnostic import of certain crystals which he had found in the sputa of phthisical patients; in the second he suggested a new method of discovering tubercle bacilli in sputum; and in the third he recorded finding coccidia containing tubercle bacilli in symbiosis in the lung in a case of rapid phthisis.

Dr. E. GRANDE stated that in his opinion corrosive sublimate and methylene blue may be used with advantage in the treatment of pulmonary phthisis.

Dr. CRISAFULLI read a paper in which he stated that, in his opinion, traumatic and rheumatic tetanus are identical.

Dr. C. FORLANINI (Turin) gave his reasons for considering that the production of pneumothorax artificially was only of value in pulmonary phthisis if done in the early stages.

Dr. E. PITTARELLI described a new form of combined aspiration and injection syringe.

Dr. F. RIVALTA (Rome) discussed the etiology of pulmonary œdema in croupous pneumonia, and Dr. F. CHABORG read a paper upon the influence of nasal affections upon various diseases of the pulmonary organs.

Tuesday and Wednesday, April 3rd and 4th.

Amongst the very large number of papers read in this Section on Tuesday and Wednesday, the following were of special interest: Dr. CARMON Y VALLE (Mexico) suggested that the muscular inco-ordination in locomotor ataxy is due to unequal relaxation of the muscular fibres.—Professor STOKVIS (Amsterdam) described a method for the ready detection of hæmatoporphyrin in the urine, and stated that he considered its discovery to be of some diagnostic value.—Dr. FRASER (Edinburgh) discussed the treatment of myxœdema by thyroid gland, and also described a case of pernicious anæmia which had received benefit from bone marrow.—Dr. E. GUERRA described a case of solitary tubercle in the neighbourhood of the right fissure of Rolando.—Dr. GOUVEA recorded an interesting case of apparent pulmonary phthisis which was shown to be pulmonary diastomiasis by the discovery of a distoma hepaticum in the expectoration.—Dr. CALABRESI stated that the presence of either sugar or uric acid in the blood lessened its bactericidal power, and that quinine increased it.—Dr. DA ROCHA discussed the pathogenesis of those cases of diabetes characterised by dilatation of the stomach and diminished peristalsis of the intestine.—Dr. DE RENZI (Naples) stated that he had produced diabetes by excision of the duodenum and of