remained the same, although at one time the pulse was at 70, at the other at 110. Whether the emptiness of the arteries in convalescence depends on diminution of the mass of the circulating blood (spanemia), or on relaxation of the capillary arteries, either of which would serve, on purely physical principles, to explain it, is uncertain. I am inclined to attribute most importance to the latter.

I refer to pulse No. 10 principally for the purpose of shewing how completely the sphygmographic form may be modified by merely functional, that is to say nervous, disorder; and particularly how impossible it is to discriminate between the effects of mere nervous excitement of the heart and that which accompanies pyrexia. It is the pulse of a young man aged 18, who, although he had neither lost flesh nor strength, yet, on account of a slight cough, imagined himself to be consumptive. So far as relates to its form, it can hardly be distinguished from the more frequent disordered pulse of pneumonia, which is represented in Fig. 6. In both cases, if the view which I suggested in the introduction be correct, the *suddenness* of the contraction of the heart indicates its spinal character, although the part which the nervous centres take may be different.

Fig. 11 represents the pulse of a middle-aged man recently under the care of one of my colleagues at Brompton, who had acute rheumatism eight years ago, and several times since. When the tracing was taken, he was suffering from extreme orthopnea and præcordial pain. The impulse of the heart was to the left of the mammary line, and occupied a space as large as the palm of one's hand. A loud diastolic *bruit* was heard at the fourth cartilage, and a systolic bellows-sound over the aorta. Posteriorly, there were dulness at both bases, and abundant sub-crepitant *râles* in inspiration. There could, therefore, be no doubt as to the nature of the case, which soon terminated fatally. After death, it was found that the aortic valve was so altered that the most copious regurgitation of blood must have taken place during each diastolic period. In this case, the pulse exhibits characters which, I believe, are not met with excepting in connexion with aortic incompetence. These do not consist, as is often supposed, in the unusual verticality of the expansion; for, as has been already seen, this peculiarity may be produced by merely functional disorder. The distinctive peculiarity consists in the collapse. The tracing shows that the artery becomes completely emptied during the interval between each beat and its successor; so that the diastolic expansion is no longer indicated. The explanation is simple. Immediately after the heart has ceased to contract, the blood injected into the aorta rushes back into the relaxed ventricle; so that, although the arterial equilibrium is for a moment disturbed, it is almost immediately re-established, the excess of pressure in the great arteries being at once relieved. In other words, the elastic force, which is naturally expended in producing what is called the diastolic expansion, is wasted in regurgitation.

Fig. 11.—Pulse of Aortic regurgitation. H. R., aged 36.

Fig. 12.—The same. H. K., aged 38.

The next case (Fig. 12) is that of a man of similar age, who in like manner had rheumatism about fifteen years ago, and several times since, but did not suffer from disease of the heart until his last attack in August 1866. The præcordial dulness in this case did not extend beyond the mammary line. The impulse was diffused and expansive, and ended in a sudden retraction of the wall of the chest, easily felt by the hand. A diastolic *bruit* was heard at the fifth left cartilage, and a systolic *bruit* in the arteries, just as in the previous case. The tracing indicates that the primary expansion of the artery was sudden and excessively violent; and the collapse so complete, that the second beat is only slightly indicated. In such a pulse, one might imagine that the artery was entirely empty during the pause of the heart; but I have found that, by weakening the spring of the sphygmograph, I could obtain tracings in which both the second event, of which the diagram gives no indication, and the diastolic collapse, are expressed.

[To be continued.]

CHOLERA IN BHOOTAN.—Cholera in a most virulent form is said to have broken out in Bhootan, as well as in the Terai, and to have caused a large number of deaths.

THE THRUSTON SPEECH

UPON

THE PROGRESS OF MEDICINE DURING THE LAST THREE CENTURIES.

Delivered in the Chapel of Gonville and Caius College, Cambridge, at the Wendy Commemoration, on May 11th, 1867.

BY

G. HARE PHILIPSON, M.A., M.D. CANTAB., M.R.C.P. LOND.,
Physician to the Newcastle-upon-Tyne Dispensary, Fever Hospital, etc.

EVERY age has had its peculiar taste and fashion. The same sciences have seldom been cultivated for a length of time with the same degree of ardour; they have given way to others; and all, during these transitions, have experienced changes more or less favourable to the improvement of their systematic arrangement. Medicine, at different periods, has assumed the tone of the prevailing sciences; it has ever endeavoured to speak their language, and to subject itself to the same rules; so that it has passed successively through all the different systems that have acquired any degree of celebrity in the world. Of such changes, one of the most notable occurred near the beginning of the sixteenth century, when, by the sudden and extraordinary impulse given to chemistry, the character and complexion of medical speculation was entirely transformed. It was, at this time, that inquirers first began to speculate, who believed in the transmutation of the base metals into gold, and in the existence of a something, could it but be found, which had the power of prolonging life to an unlimited period. In the researches to gain these objects and secrets, many valuable facts and principles were incidentally unfolded, many of Nature's laws were fortuitously established. While chemistry was thus progressing into the condition of a science, Hippocratic and Galenic medicine, or the doctrine of humours, began to be less practised, and the chemical mode of reasoning on the operations of the living body, and the application of chemistry to medicinal composition, came to be very generally admitted.

The benefit, however, which was conferred upon medicine by the labours of the chemists was trifling and uncertain, compared to the great and direct advance which was produced by the researches of the anatomists. Some attention had been given to the structure of organised bodies by the earlier Italians; and they had even ventured, in a few instances, to dissect the human subject. Nevertheless, scarcely any discovery or any improvement worthy of notice had been made for many ages, when Vesalius, about the middle of the sixteenth century, entered upon his career of inquiry, prosecuted his examinations with unwearied diligence, and, disregarding the obloquy that was piled upon him, succeeded in publishing an anatomical work, which, at this day, is regarded with admiration, and which maintains its character as a faithful transcript of Nature. Anatomy, being a science more immediately dependant upon the accumulation of matters of fact, hereafter advanced in rapid strides. The investigations extended to every portion and structure of the body. The labourers were rewarded by many grand discoveries. Foremost was that of the circulation of the blood, first completely demonstrated in the year 1620 by our distinguished fellow-collegian, William Harvey.

It might have been conjectured that, from this time forward, medicine, commencing as it were from a new starting point, would have regularly, if not rapidly, proceeded on to a state of comparative perfection. But, no; this new instrument of truth was destined to become a new excitation of fanciful and futile hypotheses. As the chemists had derided the Galenic faith, so the chemical era, in its turn, gave way before the doctrines of the mathematical physicians, as they have been termed. Nothing now was thought of but hydraulic motion and calculation of forces. How far from truth some of the inferences were respecting the same particulars, may be inferred from the vast difference in the deductions broached by different theorists; for, while the force of the heart was estimated by one at a few ounces, it was calculated by another to be many pounds.

Through the succession of these diverse doctrines, disease was alike supposed to take its origin from the fluids of the body. This supposition continued to be accredited until the beginning of the eighteenth century, when the celebrated Boerhaave initiated the adverse. This individual, like the eclectics of old, aimed at incorporating with his own

particular views the best portions of the medical philosophy which had preceded him. It does not appear that he endeavoured to be the founder of a sect; yet he proceeded with the caution of a veteran, and selected with judgment the flowers which were to adorn his own parterre. Though the writings of Hippocrates and Galen had been destroyed in solemn state, yet they were not forgotten, and the wise observations of the Grecian sages formed the groundwork of his system. The doctrine of humours he assimilated with wonderful address to his chemical notions. The mechanical philosophy added to the fabric; the vessels were cones; the fluids, consisting of various particles, adapted only to given apertures, were at times forcibly impelled and impacted in vessels to which they were not fitted, and consequently produced numerous complaints. In his inferences, however, Boerhaave overlooked, as his predecessors had also done, that the reasoning that applies to formative change and impelling power has qualifications and limits which demand careful recognition when applied to organised beings.

In a manner to remedy the defect of the Boerhaavian doctrine, the general principle of Stahl, modified by Hoffmann, came to be promulgated. In the opinion of Hoffmann, the actions of the living solid were to be looked upon as the mainsprings of disordered being, and the derangement of the fluids as subordinate to the affection of the *solidum vivens*. The human system was considered as a living and an irritable machine, susceptible of various and irregular motions. To these movements the term spasm came to be applied. Cullen, in the year 1776, when he was appointed professor in the University of Edinburgh, found the humoral pathology still in force, but expressed himself as more partial to the views of the solidists. In his pathological code, the term and notion of spasm forms a conspicuous feature, the reaction to overcome the spasm constituting the perturbation of disease. The theory of Cullen, which is virtually a modification of the Stahlian doctrine, came to be received; the terminology of the time being spasm and reaction. Attempts to generalise have since been of a different character. Instead of physic uniting with metaphysic, and aiming to reduce vital causation and deranged action to one leading and generally applicable law, in the same manner that gravitation is applied to the phenomena exhibited by inanimate matter, recent systematists have endeavoured to localise disease. They have laboured to prove that affections of this or that part, or primary derangement of one or other organ, are the excitants of general derangement.

In special progression, the present century is abounding. Numberless are the questions in physiology which have been elucidated. The causes of sudden and violent death have been determined; the different purposes served by distinct parts of the nervous system have been explained; the exact composition of the blood in health and disease has been decided; and the nature of the changes which take place in the air and blood during respiration have been clearly defined.

In juxtaposition may be placed the more precise and extensive information that has been obtained relative to the external causes of diseases. By statistical inquiry, the amount and mortality of diseases have been acknowledged. By careful and patient research, the nature of the morbid poisons which excite disease has been worked out. The contagious character of the fevers of this country, of yellow fever, and of malignant cholera, have been freely and successively agitated. The laws of the origin and diffusion of the malaria producing intermittent and remittent fevers have been investigated; and the extraordinary protection afforded by vaccination against small-pox has been established.

The additions which have been made of late years to our knowledge of the nature and proper treatment of diseases in considerable part may be traced to the extent and minuteness with which pathological anatomy has been studied. As the healthy body has been examined to obtain a knowledge of its structure, so the diseased body has been scrutinised to ascertain the precise change produced. The microscope and chemical reagents have made visible the arrangement of the constitutional elements. It is from judicious reasoning on the more exact knowledge thus acquired, that any material improvement in the precision of practical rules has been attained. This applies particularly to inflammatory diseases—those in which remedies avail the most. The different courses and effects of inflammation, as it influences the different textures of the body, have not only been ascertained by dissection, but characteristic symptoms resulting during life from the consequences of this condition, in parts of the body not open to ocular inspection, have been clearly pointed out. This is remarkably the case in regard to inflammations within the chest. The lesions resulting, as well as other organic changes in that part of the body, may be ascertained by manual examination, by auscultation, and by percussion, with a precision formerly unknown. Diseases may now be recognised, which in time past might have been confounded under one general term, but which it is not only satisfactory, but practically important, to distinguish, because they admit of relief from different modes of treatment.

The diagnosis of diseases has also become much more exact, and has lost much of its conjectural character. This change has been brought about by combining a knowledge of physiological and morbid states with physical examination and the exploration of symptoms. Physical science likewise has yielded valuable assistance, and has contributed the stethoscope, the ophthalmoscope, the laryngoscope, the endoscope, specula, the sphygmograph, and the thermometer—all most useful as aids to diagnosis.

Medicine at the present day is so far advanced, that it may be asserted that the fundamental principle upon which it is founded cannot longer be said to rest upon mere conjecture and faith, but upon positive proof. By its very nature, it is prevented from proceeding in that uninterrupted way in which some other departments of knowledge have progressed. Moreover, at no time more than at the present has the mind of the profession been more active. There is a growing disposition—nay, predominant inclination—to reconsider old tenets, and to foster new proposals, in a right spirit of dubiousness with the past and hope in the future.

ON THE INFLUENCE OF THE ALPINE CLIMATES ON PULMONARY CONSUMPTION.*

By HERMANN WEBER, M.D., F.R.C.P.,

Physician to the German Hospital.

THE fact that consumption does not occur amongst the inhabitants of some elevated regions is by no means new; nor is it unknown to the profession that, in some countries, the practice prevails to remove persons manifesting signs of consumption from lower localities where they have been thus attacked to higher regions. I should occupy too much space if I were to enter fully into the history of this interesting question; but I cannot forego directing attention to the important labours of Dr. Archibald Smith of Edinburgh, who has availed himself of his long residence in Lima, and in various places of the Peruvian Andes, practically to study the influence of the Andine climates on phthisis. He refers to this subject in various of his valuable papers on the Diseases of Peru,† and has quite lately‡ done me the honour to reply to an appeal for co-operation in the study of this question. § Lombard, Mühry, and Hirsch, have likewise, in their well known works, very ably treated the subject. Jourdanet has adduced important facts for Mexico, Fuchs for Germany, and Schnepf for the Pyrenees, especially for Eaux-Bonnes. The degree of elevation necessary for producing a certain degree of immunity seems to vary in different latitudes, and appears to be lower in the temperate than in the tropical regions. While, in the latter, phthisis may be regarded as becoming rare above 7000 feet, the frequency diminishes in most parts of Switzerland already above 3000 feet, and in the mountains of Central Germany already above 1400 feet. Elevation alone, however, seems not to be the only point of influence, even in the same mountain range; but there are other circumstances which assist or counteract its influence, as the degree of motion in the atmosphere; the situation of a place, either on high table-land, or on the top or on the incline of a hill, or in a valley; the configuration of the surrounding ground; the degree of exposure to the sun's rays; the aspect to the south, or north, or east, or west; the geological nature of the substratum and other conditions on which the dryness or dampness of the soil depends; the nearness or absence of large glaciers or snowfields, or lakes, or sheets of standing water; the habitual clearness or mistiness of the atmosphere; the number of clear or rainy days; the quantity of rain and snow; the degree of humidity of the air; and many other circumstances, no doubt, exercise some influence. As the Swiss Society of Naturalists has appointed a committee to inquire into the occurrence of consumption in the various parts of Switzerland, and as the same Society has meteorological stations all over the country, it may be anticipated that gradually some of the circumstances influencing or counteracting the occurrence of consumption may be elucidated.

* The old term, "pulmonary consumption," is used in order to comprise not only "tuberculosis of the lungs," but also the other subacute and chronic affections of the lungs leading to consumption, which have been so well described by the late Dr. Addison, in his admirable but little known papers on the subject, in which he already, in 1838 and 1845, propounded those views which only now are gradually gaining ground.

† As early as in 1840, Dr. Archibald Smith discussed the subject in a very clear manner, in his "Practical Observations on the Diseases of Peru" (*Edinb. Med. and Surg. Journal*, No. 144); and again later, in his paper on the "Influence of the Climate of Peru on Pulmonary Consumption" (*Brit. and For. Med.-Chir. Rev.*, vol. xviii, 1856).

‡ "Climate of the Swiss Alps and of the Peruvian Andes compared." By Archibald Smith, M.D. (*Dublin Quarterly Journal of Medical Sciences*, May 1866.)

§ "Notes on the Climate of the Swiss Alps" (*Dublin Quarterly Journal of Medical Sciences*, February and May 1864).