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).

As it has been repeatedly shown that consumptive diseases, in their earlier stages, are favourably influenced by the removal of the patient to higher elevations, it appears surprising that this plan of treatment has been almost entirely disregarded by the medical men of Europe. I will, therefore, shortly discuss the principal objections met with in conversation with men of deservedly high reputation in our profession.

1. The low temperature and the roughness of the Alpine climate during the greater part of the year are usually regarded as hostile to the delicate constitution of the consumptive patient. Cold, however, is in itself surely no cause of phthisis, which, in some of the most northern parts, is rarer than in the South of Europe. The popular prejudice against cold may, perhaps, be understood, by considering that cold induces delicate people to remain indoors, and keep their doors and windows closed, and that it often prevents the poor from gaining their livelihood; that it, therefore, gives rise indirectly to the most powerful causes of consumption: viz., confinement in ill-ventilated rooms, insufficient exercise and imperfect breathing, scanty clothing, and want of proper food. With more reason we might say, that cold in itself counteracts the tendency to consumption where there is a sufficiency of food and clothing, for it causes an increased abstraction of heat from the body, to supply which the respiratory action must be proportionately increased and the expansion of the lungs promoted, which latter is one of the greatest prophylactics against consumption.

2. A second objection often raised is, that the rarefied air of elevated localities increases the tendency to hæmoptysis. It probably owes its origin to the description of great ascents by Saussure, Humboldt, and others; but these climbers were in conditions very different from those of the invalid gently walking about near his temporary mountain residence. Those who have ascended high mountains, and especially steep snow-slopes, without being in thorough training for such work, will remember the violent beating of the heart and the throbbing of the carotid and temporal arteries, which might, one should think, easily lead to rupture of the weak vessels; yet, how rarely such a rupture actually does occur, how seldom any bleeding from the nose or mouth takes place, all those can testify who are in the habit of spending their holidays on the Swiss mountains. Some of the famous guides who constantly accompany the great Alpine climbers tell us that they have rarely, others that they have never, seen those much talked of bleedings, either in their fellow-guides or in their enterprising patrons. It may, therefore, be concluded that this supposed effect of rarefied air has been much exaggerated; but, even if it were to occur amongst active climbers, this ought not to deter the quiet invalid sojourning in elevated valleys. One of the most frequent causes of pulmonary hæmorrhage is probably the rapid breaking down of lung-tissue, and through this the lesion of blood-vessels before they have been obliterated; and circumstances favouring such a process are likely to increase the tendency to pulmonary hæmorrhage, while those unfavourable to it diminish the tendency; and I trust that such an influence may sooner or later be accorded to well selected Alpine climates.

But, apart from reasoning, let us see what experience teaches. Dr. Archibald Smith, after having mentioned that hæmoptysis is very common in Lima, says: "Climate is supposed to be omnipotent in the cure of hæmoptysis—i.e., the removal to the temperate recesses among the hills."* The recesses referred to are about 9000 feet to 10,000 feet above sea level. Again, he says, in another place: "Incipient tubercular phthisis, usually attended with more or less hæmoptysis, is one of the most common pulmonary affections known in Lima and other parts of the coast of Peru. It is a disease almost certainly curable, if taken in time, by removing the coast patient so attacked to the open inland valley of Jauja, which runs from 10,000 to 11,000 feet above sea-level."† My own experience is limited; but, amongst the invalids in whom I have been able to watch the influence of Alpine climates, there were five who, while living in low elevations, had suffered from one or more attacks of serious hæmoptysis, and all of them remained quite free during their stay in Alpine regions.

3. A third objection often raised is, the great difficulty of finding a proper mountain residence for the invalid; and this, I must confess, is not without foundation. It is impossible for an invalid in a changeable climate to live without a proper house and food, and some comforts; and it is almost impossible for him to live without society, occupation, and amusements. On the mountains of Great Britain there are, as yet, no such homes for invalids; but, in the British colonies, on the Himalaya range, there are probably many already well inhabited localities where consumptive invalids might regain their health, where the British army might have its sanatorium for the consumptive soldier. In South America, the Peruvian Andes offer many eligible situations, and especially, according to Dr. Archibald Smith, the two principal health-

resorts for the phthisical invalids from Lima, Jauja and Huancayo, where the climate is temperate and equable, the sunshine bright, and fogs very rare. With the increasing facilities of communication, these Andine sanatoriums for the consumptive will become more and more accessible. The high table-land of Mexico, too, may offer many eligible localities, when once the social conditions of that country have become more settled.

[To be continued.]

ON THE TREATMENT OF FRACTURES BY ELASTIC EXTENSION.

By H. WORTHINGTON, M.R.C.S., late House-Surgeon to the Middlesex Hospital.

THE many cases of fracture of the lower extremities admitted into this hospital, and the labour and pain necessitated in their reduction and successful treatment, induced the trial of elastic extension. Its mode of application is easy, and the results, as far as they have gone, have proved highly satisfactory. The following is a description of the way in which elastic extension is applied at the Middlesex Hospital.

The splint employed is of suitable size, and a modification of that recommended by Mr. Barwell for extending the leg in hip-joint disease.

It consists of a long, straight, stout splint, with a piece of wood about a foot in length let in at right angles to it about six inches from its lower end. The long arm of the splint is well padded on its inner side. An inch or two from the upper end of the splint is a small pulley, fixed in an aperture made for the purpose; a similar one is placed at the lower end. That part of the splint which is let in at right angles, is provided with a slit extending nearly its whole length, admitting another pulley of similar size, which can be shifted to various parts by means of an iron pin passing through holes bored in the sides of the cross-piece. A strong piece of strapping is now applied to the sides of the leg, leaving a loop at the sole of the foot as in the ordinary way, care being taken that the loop shall be large enough to admit a tightly rolled leg-bandage; this being placed transversely at about the middle of the sole of the foot, so that it is enabled to receive all lateral pressure when extension is applied. Without this, the strapping would cut the hollow and outer side of the foot, and give rise to considerable pain and inconvenience. In cases of fracture of the leg, the strapping should not come above the seat of injury. The foot should now be bandaged, so as to retain the strapping firmly. A piece of strong cord is then fastened to the loop of plaster, so as to include it and the roller, and this gives us a fixed point to pull upon from below. The cord, thus fastened, is next passed over the pulley which lies in the slit in the cross-piece, then over the pulley at the lower end of the splint, and is carried to about the middle of the outside of the long side-piece. Here it is attached to one end of a patent elastic door-spring, or accumulator. To the upper end of the elastic is attached a piece of wood,* about four inches long, one inch broad, and half an inch thick, perforated by three holes equidistant, and just large enough to admit the cord used. By one of these holes, it is secured to the elastic. A well padded perineal band is now applied, to the upper part of which a separate piece of cord is fastened. This is brought over the pulley at the upper end of the splint, and then made to perforate successively the two remaining holes in the piece of wood attached to the elastic. It will now be evident that, by slipping this piece of wood up the cord fastened to the perineal band, the elastic will be put on the stretch, and, in this way, extension may be regulated to a nicety.

The limb may now be brought into position, and extension applied as far as is deemed advisable. It does not appear necessary to reduce the fractured limb to its normal length on the immediate application of the splint; for, if this be not directly obtained, the constant extension

* "Practical Observations on the Diseases of Peru," *l.c.*, p. 8.

† "Climate of the Swiss Alps and Peruvian Andes compared," *l.c.*, p. 349.

* Similar to what is used for tightening the robes of tents. It is used here on the same principle, and was suggested by Mr. De Morgan.