particular, however, Dr. Beddoe differs from Senator Hoar; that is, in respect to the origin of the custom of gavelkind, by which the land of the father descends to all his sons in equal portions, — a custom adopted by our ancestors from the usage of Kent, and which has had a most important effect upon our history in fostering democratic institutions. Our author believes that this institution was derived from the Kymric branch of the ancient Britons, and not the Germans, and that the term can be best explained by the Welsh language.

Great differences of opinion prevail among recent writers as to the consequences of the Anglo-Saxon conquest of England, hinging mainly upon the degree of credibility attached by them to the statements of the old British chronicler, Gildas. Some hold with Freeman and Green that the ancient race was mostly exterminated; while Nicholas, and the Keltic school in general, are equally convinced that the British element predominates in the modern English people. Our author's conclusions upon this interesting subject may be summed up as follows: About the middle of the fifth century certain German tribes, invading the country, settled some districts almost exclusively, making serfs of some portion of the prior population, and forcing the remainder to the west and the south. They uprooted Christianity, and changed to a great degree the local nomenclature. But they adopted, or allowed to remain, many usages relating to the land, and they intermarried largely with the native women; so that their descendants exhibit changes in physical type which approximate them somewhat to the original inhabitants. In language the most important and necessary words, particularly among the verbs, are Teutonic; so are most of the grammatical forms and rules; and so, also, is the pronunciation.

The Danes, in the latter part of the ninth century, by their invasions, gave a strong Scandinavian tinge to the eastern counties of England, and made themselves exclusive masters of the islands around Scotland: in other parts of the country their influence is not marked.

But the Norman conquest, although it did not at once introduce any very large accession to the population, undoubtedly produced the type that is still the prevailing one among the upper classes of England. Our author finds, by an examination of the color-tints of portraits of the nobility, a prevalence of dark hues, even more marked in the sixteenth and seventeenth centuries than in the nineteenth. The severity of the conquest was chiefly felt in Yorkshire and parts of Lancashire, where the Anglo-Danish population was nearly destroyed. In other parts of the country no permanent change in the physical type or racial elements seems to have resulted from it. In this branch of his inquiries, Dr. Beddoe has drawn, principally from Domesday book and other mediaeval records, interesting and useful inferences, which we regret not to be able to quote.

We will conclude by calling especial attention to three exceedingly well executed plates, in which are represented living faces, which, in the judgment of our author, reproduce the various types of 'the races of Britain.' His remark about 'the singular beauty of the women of Devonshire' seems fully warranted. H. W. H.

THE CAUSATION OF PULMONARY CONSUMPTION.

SCARCELY four years have elapsed since the important discovery of the tubercle-bacillus by Koch was announced. Many then thought that the key to the various problems of pulmonary consumption was close at hand, if not in our actual possession. Certainly therefrom a new impetus has been received in the study of these problems, — an impetus that may eventually bring about their solution; but so far this discovery has added but little to our actual knowledge of the causation of this most insidious disease.

This bacillus is readily and definitely distinguished from other allied micro-organisms. It seems to be present in tubercles wherever found, and is usually apparent in the sputum of consumptives; in some few cases it is believed to have been detected in the sputum when no signs of the disease were discovered; and other cases are known where the most careful examinations have failed to detect them, though tubercles were unquestionably present. Still the evidence so far is only negative. We may, without doing violence to the facts, assume that the bacillus Kochi is a constant accompaniment of tuberculous disease. They are remarkable for their vitality: decomposed or even dried sputum containing them retains all the powers of the fresh microbe, even after months have elapsed. Inoculated into the tissue of animals, either in the fresh state or after cultivation, they almost invariably produce tuberculous disease, though never the ordinary chronic consumption, but quick consumption, or miliary tuberculosis, which is held to be distinct in its nature. From these facts the conclusion would seem self-evident that floating particles of dried sputa, or at least when freshly thrown off from the diseased subject, might easily enter the lungs of healthy persons, and reproduce the disease. Unfortunately clinical evidence does not support this *a priori* deduction. Recent observations demonstrate that food impregnated with tubercu-

lous matter will produce corresponding disease in the intestine and other abdominal viscera. A number of dogs, subjected for several weeks to an atmosphere surcharged with particles of sputa, became tuberculous, but the evidence is not convincing.

The possibility of tubercular inoculation has been known for years. To Koch is due the credit of discovering wherein the peculiar agency consisted.

The contagiousness of pulmonary consumption has been believed for more than a century, and still is accepted by many physicians. Dr. Hermann Brehmer, upon whose extensive work[1] the present article is based, warmly contests these views, and, it must be admitted, with ability. He, in brief, endeavors to prove that pulmonary chronic consumption is never produced by the bacilli, and is neither contagious, nor, strictly speaking, hereditary. As the director for more than thirty years, of a private institution for the treatment of consumptives, he has been able to study nearly twelve thousand cases, chiefly drawn from the better classes. Certainly conclusions based upon such ample clinical material are entitled to our consideration.

Though some adherents of the bacilli theory of contagion have believed that these organisms are directly hereditary, lying latent for a longer or shorter period, to finally take on activity, yet such a view seems wholly improbable, if not absurd. Thus it is apparent, in what is considered hereditary consumption, that that which is entailed upon the offspring of consumptive parents is not the disease itself, but merely the disposition to the disease, — the consumptive habitus. If such a predisposition exist, as it unquestionably does, wherein does the true causation lie? Not in the bacilli, for they merely find a soil already prepared for their reception, and isolation does not appear to affect the chances of such predisposed persons becoming diseased. A sound, healthy person never becomes infected by the bacilli, at least never in the form of chronic pulmonary consumption, and the possibility in any other is not yet proven. It is only those in whom a predisposition exists — a consumptive habitus — who acquire the disease. What, then, is the true causation of the ordinary phthisis? This the author endeavors to show.

He has shown from the researches of Rokitansky, and his own, that the lungs of consumptives are abnormally large, and the heart and abdominal viscera are abnormally small. Thus the lungs do not receive their due amount of nourishment, and become the foci of disease, where the bacilli readily and easily find a lodging-place. This view may appear startling, yet it seems well sustained. The flat-breasted person of consumptive tendency has the lungs, not small, as is generally supposed, but elongated and large; the heart not merely atrophied, but actually lessened in capacity and power. Thus the relation between the normal heart and lung is about one to six; but in many consumptives so great a discrepancy as one to twelve may exist. The relation between the lungs and heart may consist not only in the former being too large, or the latter too small, but both may be actually normal so far as size is concerned, and the evil be found in abnormally small pulmonary arteries. Not only does the heart show physical incapacity, but it is functionally weakened, palpitation always existing to a greater or less degree in consumptives. Whatever may be the exact relation between these organs, the result is invariably the same, — deficient nutrition to the tissue of the lungs. Rarely are the abdominal viscera enlarged, and almost constantly it is found that consumptives have never been hearty eaters. A person with large breast, and its accompanying small lungs, an enlarged and powerful heart, well-developed abdominal viscera, and a hearty appetite, rarely, if ever, becomes consumptive.

Here, then, is the ultimate cause of the disease, — impaired nutrition. This impaired nutrition may be the resultant of various antecedent causes. First, and most important of all, is that due to heredity or prenatal life. Instances are too numerous to require argument, that acquired peculiarities may be and are transmitted to offspring. Impaired vitality, from whatever cause it may be due, re-appears often in the child. When such impaired vitality consists in the predisposing abnormal correlation of lungs, heart, and viscera, the fuel is prepared that only needs the match to start into active flame. The question here is of the greatest moment, — Were the tubercle-bacillus no longer in existence, would tuberculous disease become extinct?

A predisposing cause of but little less importance is that of the exhausted vitality in the mother, due to too frequently repeated gestation, — a cause that not only affects children of later births, but retro-acts strongly upon the mother. Thus it is that the later descendants of large and numerous families are more disposed to consumption. Again: lack of nutrition in childhood, whereby the healthy and normal development of the alimentary and arterial systems is retarded, produces a like disposition.

Injuries to the lung, in some instances, have

[1] *Die aetiologie der chronischen lungenschwindsucht, vom standpunkt der klinischen erfahrung.* Von HERMANN BREHMER, sen. Berlin, *Hirschwald*, 1885. 8°.

been thought to be an exciting cause; but such cases are due, the author believes, to the partial stagnation of the blood in the lung. In such rare cases where the disease first appears in the right lung, the author believes it to be owing to some malformation or aneurism, whereby this lung receives a less quantity of blood than the left.

Dr. Brehmer gives a history of five hundred cases in full, — cases in the offspring of non-consumptive ancestry, of those suffering under scrofulous or allied evils, and cases due to heredity. Other interesting results are perceived from the study of these cases. An unquestionable interrelationship appears between consumption, mental derangement, epilepsy, and deaf-mutism. The researches of Professor Bell upon deaf-mutism have, the present writer believes, substantiated the relationship of this last defect with other defects, and also show its heredity. May not all these proceed from the same general cause, — the transmission from parent to child of abnormal or deficient organs, which are ultimately due to impaired nutrition or unfavorable environment? That such effects do not follow deprivation alone, is apparent. Too great culture or luxurious habits certainly seem to be exciting causes. How much they are owing to nervous influence is a problem of interest. It is a well-established fact that wild animals kept in confinement are especially liable to phthisis. The most highly bred strains of domestic stock are likewise prone to tuberculous disease.

That consumption is contagious in the ordinary sense of the word, the author emphatically denies. It is true that the bacilli are rarely found in the atmosphere, except in large hospitals, where many cases of the disease are treated; but the author contends that a person not predisposed may expose himself with the utmost impunity to the contagia without becoming infected. As an evidence, is adduced the fact that in Göbersberg, during the last forty years, many thousand cases have been treated; nevertheless, the mortality from this cause among the inhabitants of the place has actually decreased by about fifty per cent from that of the preceding forty years. A century ago, in Naples and in Portugal, legal enactments placed this disease under the most rigorous ban. It was looked upon and treated as one of the worst pestilential diseases, and every thing connected with it pronounced unclean and dangerous. For fifty-six years were these rigorous laws enforced, to the great discomfort of the people, but without result: there was no decrease in consumption. He disclaims the prevalent opinion that married people will contract the disease from one another. Indeed, according to his experience, it is very rarely indeed that both husband and wife die of consumption. It is worthy of note, however, that whenever facts seem to warrant the assumption of contagion between husband and wife, it is usually the wife who suffers.

The author believes that the operation of all these causes is such that morphological changes are brought about, enabling one years, even decades, in advance, to predict with great probability which members of a given family will be afflicted with pulmonary consumption, and which will remain healthy. When acquired peculiarities through generations have become fixed, then, and in this sense only, does pulmonary consumption become hereditary.

Should these views of the causation of consumption be sustained, the question of contagion, or rather non-contagion, in another decade will no longer be disputed, and then the possibility of the conveyance of phthisis from man to man, in any other way than by direct inoculation, will be looked upon only as a superstition. When such definite conclusions have been reached, we will at last be in a position to study rationally the all-important problem of prevention and treatment.

N. W.

AN important investigation into the chemical constitution of the venom of the Indian cobra (Naja tripudians) formed, says the *Lancet*, the subject of a paper read before the Royal society, on Dec. 16, by Dr. R. Norris Wolfenden. It has been alleged that the venom of this snake contains an alkaloid and a principle known as 'cobric acid.' Dr. Wolfenden has been unable to verify either of these assertions; indeed, he denies the existence of both substances. He further shows that the venom loses its power when the albuminous bodies are removed or otherwise rendered inert. Mixtures containing the cobra poison, when treated with metallic salts that precipitate albumen, were found harmless. Wolfenden, like Weir Mitchell and Reichert, has found three poisonous proteids in the venom. The largest quantity of proteid was a globulin that had asphyxiating properties; and a smaller quantity of syntonin, possessing similar properties, was also detected. A form of serum albumen existed in minute proportions, and this was ascertained to have remarkable powers, paralyzing small animals. It has been objected that the possession of poisonous qualities by a serum albumen is a unique fact, but Schmidt-Mulheim and Albertoni have found ordinary peptones to be toxic when injected into the blood, causing various nervous disturbances, lowering the blood-pressure, and preventing the coagulation of the blood.