which Professor Max Müller attributes the alteration in the meaning of the word.

Moreover, a great change in the vegetation of a country, such as the replacement of the Danish oak-forests by forests of beech, must have occupied many centuries. At what moment, then, was the name transferred from one tree to the other? Were the people of Denmark content to have no name for the beech when it first appeared, and what did they call the oak after having deprived it of its original title, in the prolonged period during which the two trees must have been growing side by side?

Another hypothesis, less beset with difficulties, has been advanced by Geiger and Fick, who suppose that the word originally signified the beech, and received among the Greeks the changed signification of the oak. If the Greeks had migrated from a land of beeches to a land of oaks, there is no difficulty in understanding that they may have transferred the name of one tree to the other. The word meaning the food-tree (*φαγ ἴν*, "to eat") would be as applicable to the evergreen oak, with its acorns, as to the beech, the mast of which was the staple food for their swine. The beech, as has been said, is not found south of Dodona, which lies in the centre of Epirus. It is noticeable that the most ancient Greek legends are connected with Dodona, where the Greeks made their first halt in their progress to the south, and where the earliest prophetic utterances were obtained from the rustling of the leaves of the sacred tree, — the *φηγὸς*. Hence we may believe that the Greeks entered the peninsula, not from Asia Minor, but from the northwest, through the valleys of Epirus. This route would explain how the old Aryan word denoting the beech came to be applied by the immigrants to designate the tree which flourished on the hillslopes of their new territory. In modern times we have similar instances of transferred names in the United States, where such English names as "the robin," "the hemlock," and "the maple" are used to denote wholly different species.

But with regard to the Greeks, it may be urged that before they entered the peninsula they must have been already acquainted with the deciduous oak which flourishes in the region whence they emigrated. This objection is met by the fact that the Greeks had a second name for the oak, *δρῦς*, which corresponds to the old Irish *daur* oak, as well as to the Gothic *triu*, and the Sanscrit *dru*, which mean simply a tree. Both of the Greek words for the oak are used by Sophocles in speaking of the sacred oak at Dodona.

The Greek word for the deciduous oak agrees with the Celtic word, while the Greek word for the evergreen oak was the word which in their former home had denoted the beech.

The question as to whether the original Aryan word denoted the beech or the oak is not unimportant, as from it may be drawn an inference as to the primitive seat of the Aryan race.

According to Professor Max Müller, the Aryans migrated from Central Asia, where the beech is unknown. If this had been the case, it is extremely difficult to explain how the ancestors of the Latins, Celts, and Teutons, migrating, as Pictet maintains, at different times and by different routes, to lands where the beech abounds, should all have chanced to call it by the same primitive name, merely modified according to the fundamental phonetic laws of Latin and German. But, on the other hand, all such difficulties disappear if we assume that the cradle of the Aryans was in the original beech region; that is, roughly speaking, in the valleys of the Rhine, the Main, and the Danube; and that it was here that the differentiation of the Greek, Latin, Celtic, and German languages took place.

The name of the beech bears also on the solution of the question as to which of the neolithic races has the best claim to represent the primitive Aryans. The choice probably lies between the brachycephalic Celto-Latin race, some of whose earliest settlements may be discovered in the pile-dwellings of Bavaria, Switzerland, and northern Italy, and the dolichocephalic Scandinavian race, whose remains are found in the Danish kitchen-middens. That one of these races constituted the primitive Aryan race, and imposed its language on the other, is highly probable.

Now, as we have already seen, in the neolithic age the beech had not yet reached Denmark, the fir being at that time the predominant tree. In the bronze age the fir was succeeded by the oak, which gave place in the iron period to the beech: hence the beech region was at that time inhabited by the Celto-Latin people, while the Scandinavian race in all probability dwelt to the north of its limit.

The beech has therefore a threefold ethnological significance. 1. It proves that the Greeks entered Hellas from the north, probably through Epirus, and not, as has been contended, from Asia Minor. 2. It proves that the differentiation of the Aryan languages took place not in Asia, but in Central Europe, on either side of the beech line; the Slavs and Lithuanians being to the east of it, the Greeks, Celts, and Latins, farther to the west. 3. It makes it probable that the primitive Aryans belonged to the brachycephalic Celto-Latin race, and not the dolichocephalic Scandinavians.

ENGLAND'S COAL-RESOURCES.

A PAPER on this subject was read by Professor Edward Hull at the recent meeting of the British Association. To at once set at rest any alarm that may be felt as to Professor Hull unfurling the old banner of "Exhaustion of English Coal-Fields," *Engineering* states that he estimates there is enough coal in Northumberland and Durham to last, at the present rate of consumption, for three hundred years; supposing, of course, one goes deep enough for it. Before that period has elapsed, however, it is to be hoped, on behalf of posterity, that the petroleum-engine, the sun-motor, or some other force, will have promoted steam and gas engines to the serener atmosphere of the antiquarian museum.

Professor Hull is the director of the Geological Survey in Ireland, and he naturally turns to coal as a refreshing subject, which has not become hackneyed to him by his official labors. By a diagram shown on the walls, the output of coal since the beginning of the century was given. The figures have often been quoted, but may be given once again in brief. In the year 1800 the output of coal probably did not exceed 10,000,000 tons, a very large proportion of which was drawn from the Newcastle district. In the year 1830 the quantity raised in the British Islands was about 29,000,000 tons, it 1860 it had reached 80,042,698, and in 1888 the quantity had reached about 170,000,000 tons, as shown by the returns issued by the Board of Trade. There was reason for believing that between the beginning of the century and the year 1875 the output of coal had more than doubled itself for each successive quarter of a century. Since the year 1860, in which the author had estimated that sufficient coal existed to a limiting depth of 4,000 feet to last, at the rate of production for that year, for one thousand years, the available quantity of coal had been reduced by 3,650,000,000 tons; but this amount, great as it was, had not very materially affected the coal-resources. The production of the South Wales coal-field had doubled in the quarter of a century between 1854 and 1879, and in 1888 amounted to the enormous total of 27,355,000 tons, largely owing to the demand for steam-coal in the Cardiff district. The resources of this great basin are enormous, and render it capable of maintaining or increasing its present output for a long period of years. The Lancashire and Cheshire and the great Yorkshire and Nottingham coal-fields are highly progressive, as is also the Northumberland and Durham. This great northern coal-field, notwithstanding the long period over which it has been worked, shows no signs of falling off in its output. The discovery of the liassic ironstone of the Cleveland district, and the great exports from the northern ports, have given a vast impetus to northern coal-mining during the last quarter of a century; and the enormous drain upon this coal-field, the limits of which have been definitely determined, cannot fail to cause a serious falling-off in its output during the twentieth century, although there is sufficient to maintain the present rate of consumption for three hundred years. The relation between coal-production and the development of the iron trade since the discovery of the ironstone deposits of the North Riding of Yorkshire, and the richer hematites of North Lancashire and Cumberland, was then considered; and the different coal-fields of the British Isles were passed in review in order to show those which are in a progressive condition, and which are stationary or retrogressive. The author concluded his subject by expressing an opinion, that, while the enormous output of coal during the past few years had not actually crippled England's resources, a general rise in the value of coal must ensue in the near future, owing to

the greater depth at which the mines will have to be worked, and the increased cost of coal-mining. Reference was then made to the great expansion of coal-mining in America, and the author agreed with the late Professor Jevons that future British manufacturers must not expect to derive any help from the import of coal from the United States when coal shall have become dear or scarce at home.

A good discussion followed the reading of this paper. Mr. Bourne pointed out that the opening of the Canadian route to the East would ease the demand on English product, as coal had been discovered in the Dominion. Thus the Peninsular and Oriental ships, instead of filling with English coal at foreign stations, would probably be running from Vancouver to China and Japan, and use Canadian coal. The speaker looked to petroleum to lessen the demand for coal in many instances, as it had already done in many cases. He did not consider the electric light had done much in this direction, but, if water-power could be more largely used, some relief might be hoped for in that direction.

Mr. G. W. Hastings, M.P., spoke on the aspect of the question from the political economist's standpoint, and pointed out that coal-owners had been making very little profit from their exports.

Mr. John Marley, president of the Northern Institute of Mining and Mechanical Engineers (Darlington), said it would be well if Professor Hull had taken into consideration one or two facts in connection with the coal-trade. One was that thirty years ago the amount of coal required for the production of every ton of pig-iron and its detailed manufacture was double the quantity it is now. That would, therefore, form an element in future calculations. Also the manufacture of steel only required about half the number of tons of coal which was required for each ton of manufactured iron. Another point which the professor had named was his differing from the Royal Coal Commission in not taking into account the coal-seams between 12 inches and 24 inches in thickness. The professor evidently thought that these seams will not come into play so much as he (Mr. Marley) would venture to submit they will, on account of the great depth to which shafts will have to be sunk to work them. He would call Professor Hull's attention to the fact that these shafts have to be sunk, and are sunk, to the thicker seams; and when these thicker seams are exhausted, then the thin seams, between 1 foot and 2 feet in thickness, come into play. He spoke of what was an actual fact, for he knew many instances where seams of 14, 16, and 18 inches were at this moment being worked profitably in the county of Durham from shafts sunk from the thicker seams. Professor Hull would therefore see that his objection to the expensive shafts for these thin seams did not really apply.

Professor Hull, in reply, did not anticipate that petroleum, however largely it was likely to come into use in England, would make very much difference in the demand for coal. As to Mr. Marley's remarks on the greater economy of fuel in the manufacture of iron, he himself could remember when eight tons of coal were required in the Midlands for the production of one ton of iron, while now only 1¼ tons of coke were required in Cleveland per ton of pig-iron. At the same time, the economy in the use of coal was more than counterbalanced by the enormous increase in the production of iron.

HEALTH MATTERS.

Insanity following Surgical Operations.

IN a recent letter to the *British Medical Journal*, Dr. Tait writes, —

"I have now performed, so far as I can estimate, between seven thousand and eight thousand operations requiring the use of anæsthetics, and I have had anæsthetics administered in my practice for purposes not involving traumatism probably in three thousand more instances, and I know of seven cases of sequent — not necessarily consequent — insanity. Of course, there may have been others not known to me, and I shall say fourteen cases to cover that margin of error. My own practice, therefore, does not yield a proportion of cases of insanity following operations larger than the general proportion of insanity in the adult female population; and, if I include the cases of anæsthesia, it is probably considerably smaller.

"Dr. Denis, in his book on this subject, says, 'En moyenne, on observe 2.5 cas d'aliénation mentale sur 100 opérations.' But if this had been the case, all of us engaged in active operating practice would have felt the influence of the fact long ago. Personally I have been struck by the occurrence of insanity after operations as being like the occurrence of tetanus, — something to be met with occasionally, but not a matter to calculate upon. If I saw an insanity rate of 2.5 in my operations, it would be more striking than any death-rate in every thing but my hysterectomies, and in that class I have already said I have never seen insanity follow in a single instance; and Dr. Bantock's experience amounts to practically the same result, for his exception cannot really be called one of insanity following an operation. As a *per contra*, I can point to at least thirteen cases where operations have cured insanity."

TRANSPLANTATION OF SKIN FROM A CORPSE TO A LIVING PERSON. — Dr. Bartens has successfully transplanted the skin of a corpse to a living person who had been severely burned. His method of procedure, as described in the *Brooklyn Medical Journal*, was as follows: On Dec. 13 a lunatic died in the hospital of pyæmia following a compound fracture of the arm, and about twenty minutes after his death two large, good-conditioned flaps were removed from the legs of the corpse. These were laid in warm water to which a little salt had been added, and then were taken to the division of the hospital (two or three hundred yards away) in which the scalded boy lay. These flaps were then carefully washed, and cleansed of their subjacent fatty pannus; that done, they were divided into smaller pieces of from one centimetre wide to about one to two centimetres long (the ulcerated surfaces of the boy's legs had been cleansed in the same manner as the flaps in the mean time); then these pieces were laid on to fit as nearly as might be, dusted over with iodoform and covered with batting, and compresses applied. This whole proceeding took about one hour and a half from the time of the death of the old man. There were twenty-eight pieces applied in all; as it happened, too, fourteen on each limb. On the 19th of December the bandages were removed for the first time, and it was found that there was union of twenty-four of these grafts.

COCAINE HALLUCINATIONS. — MM. Magnan and Saury report three cases of hallucination due to the cocaine habit. According to the *British Medical Journal*, one patient was always scraping his tongue, and thought he was extracting from it little black worms; another made his skin raw in the endeavor to draw out cholera microbes; and a third, a physician, is perpetually looking for cocaine crystals under his skin. Two patients suffered from epileptic attacks, and a third from cramps. It is important to notice that two of these patients were persons who had resorted to cocaine in the hope of being able to cure themselves thereby of the morphine habit, — an expectation which had been disappointed. For more than a year they had daily injected from one to two grams of cocaine under the skin; without, however, giving up the morphine injections, which were only reduced in quantity. The possibility of substituting cocainism in the endeavor to cure morphinomania is a danger, therefore, which must be carefully held in view.

NOTES AND NEWS.

THE officers for the coming year of the Society for the Promotion of Agricultural Science are Professor C. E. Bessey of the University of Nebraska, for president; Professor W. R. Lazenby of Ohio University, for secretary and treasurer; and professor T. J. Burrill of Illinois University, for third member of the council.

— The thirty-third annual convention of the Association of College Presidents in New England began Nov. 7, in New Haven, Conn., at the residence of President Dwight. Delegates were present from eleven colleges, including President Eliot of Harvard, President Warren of the University of Boston, Professor Richardson of Dartmouth, President Smith of Trinity, President Carter of