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FOREST CULTURE IN HANOVER.

IN various parts of the United States the question has been raised, by what measures the preservation of forests and the plantation and culture of trees might be most effectually promoted in parts void of timber. In connection with this it might be desirable to learn something about the state of forest management in the province of Hanover. This province, the former Kingdom of Hanover, according to a report by Consular Agent Simon to the State Department, had rich tracts of forests in former centuries, which, in consequence of civil and other wars at various times, were reduced to desolate wastes and remained so until the first decades of the present century, particularly those extents between Hamburg and Hanover, which are known by the name of Luneburger Haide (Lunenburg Heath).

Besides those wars, another reason for such devastation is to be attributed to uncongenial management, such as division of common forests, by which they were dispersed and fell into the hands of people with small means, and thus were doomed to neglect and destruction. Those singly situated wooded tracts, for want of screenings, have greatly suffered by the detrimental, inclement winds, which is easily understood, since large forests will defy the violence of storms better than small woods.

Great credit for having made up for past neglect and faults is due to the celebrated Burkhardt, who, being a great authority in this matter, was appointed Director of the forest department in 1850. Part of the Luneburger Haide, as well as other tracts growing more and more desert by the encroachments of sand, have been wooded with great pains and trouble at his instigation. To prevent the increase of sandy deserts those tracts were at first planted with fir-trees. These could, in some parts, after a number of years, be cleared and substituted by beach and other trees. How much the forests have been enlarged in this manner will appear by the following statement: The wooded surface amounted in the year 1850 to 1,217,625 acres; 1885, 1,551,900 acres. By such plantation of trees river-bank and sea shore tracts have been solidified. In order to promote the establishment of forests in every respect, the Government has granted large sums for the purchase of landed property unfit for cultivation to be turned into forest tracts. The Government is now keenly intent to unite again those formerly scattered wooded parts into one single tract. In the same way the Provincial Government and Klosterkammer (Administration of cloister funds) proceed by purchasing extensive stretches of soil. The Klosterkammer administers the large funds of the secularized cloisters of the former Kingdom of Hanover, now used for the support of universities, schools, and churches in this province.

Municipalities, communities, and even private individuals who are inclined to establish forest grounds and manage them rationally will receive loans at 2 per cent and even cheaper from the Provincial Government, to be reimbursed yearly by small instalments. Also, single subsidies are granted for once for the turning of large wastes into forest grounds. For the latter purpose the provincial government resorted to a new and original method, by using vagabonds, tramps, and prisoners not of a dangerous character for forest culture, and, indeed, according to experience, with great advantage both with regard to the workers and forest culture. In this manner about 9,000 acres were planted with trees by those troublesome classes within the years 1876 to 1888. Moreover, communities as well as private individuals have turned about 14,000 acres into forest grounds within the same period by means of subsidies afforded by the Provincial Government. Besides, the matter of forest culture is encouraged and promoted on the part of the Government, as well as the provincial authorities, by the establishment of nurseries, where plants and young trees are to be had at very moderate prices.

By a legal preservation of forests in the vicinities of towns pleasant walks are created for the pleasure and health of the inhabitants, without regard to the material profit of those places. At a short distance from the old city of Hanover, for instance, was the so-called Eilenreide, a forest of about 1,500 acres, which the city now partly encircles. This forest has essentially contributed to the reputation of Hanover, with regard to sanitary condition, to the extent of its being now, according to statistics, one of the healthiest cities in Germany. Several smaller towns which own extensive forest grounds and manage them in a rational way, clear by the net yielding of those woods the whole of their municipal expenses; as, for instance, the town of Munder, situated at the foot of the Deister Mountains. The town of Goslar derives an income of $25,000 to $30,000 from an extent of 7,500 acres of forest grounds. Every traveller on an excursion to Goslar and other parts of the Hartz Mountains will have admired the fine, practical forest roads which facilitate the transport of wood. It has been estimated that, by the higher prices which the town receives at the sale of the wood on account of the easier transport, the capital invested in making these roads and keeping them in good condition yields 20 per cent yearly.

SUCCESSFUL BRAIN GRAFTING.

A PAPER on the above subject, by W. Gilman Thompson, M.D., appeared in the *New York Medical Journal* for June 28, 1890. Attempts have been made to graft nearly all the different tissues of the body. Skin, bone, teeth, muscle, nerves, glands, eyes, mucous membrane, etc., have all been grafted with more or less success, but successful brain grafting has not heretofore been performed. With the exception of skin grafting, and possibly mucous-membrane grafting, the results of such experiments have been of little practical value. They are, however, of great scientific interest in demonstrating the relative vitality of different tissues and the histological changes which accompany degenera-

tive processes. The laws of atrophy and final disappearance of disused organs, so ably advocated by Darwin, are equally striking with regard to individual tissues and cells, and it is a well-recognized fact that the higher the original development of a tissue or cell has been—i.e., the more it has been differentiated or specialized from the amœba type—the more profoundly is it affected by alterations in environment or nutrition, so as to degenerate completely, or be replaced by some form of tissue like the connective, which is of lower development but stronger vitality. The result of nerve grafting and of nerve suture after complete section have varied greatly in the hands of different operators, but, despite many discouraging failures, there is no doubt that in man, as well as in the lower animals, nerve fibres may reunite when sutured even after secondary degeneration has occurred, and they exhibit restoration of function. For this to occur, however, the nerves must be in communication with some trophic centre. Nerve grafting does not succeed so well as nerve sutures in favorable cases. It occurred to Dr. Thompson recently, while studying cerebral localization in the lower animals, that it would be interesting to graft a piece of brain tissue from one side of a dog's brain to the other, or from one animal's brain into another's, and study its vitality. Of course, he had no expectation of being able to restore abolished function by the operation, but the question of vitality of the brain tissue and the course of its degeneration is a subject which is of very wide interest. The first experiments were preliminary, made in order to ascertain whether the transplanted brain would be immediately absorbed or would slough away.

No microscopic examination was made in connection with these experiments, as it was intended only to determine the possibility of the transplanted tissue adhering. Being satisfied in regard to this matter, Dr. Thompson secured a large dog and performed his experiment. A half-inch trephine was used and a button of bone was cut nearly through over the left occipital region, leaving a small attached margin so that the button could be elevated and then depressed like a little trap-door. Through the opening 2 c.c. of brain tissue were removed. A cat was simultaneously trephined and 1.5 c.c. of brain from her left occipital region were transferred in eight seconds to the opening in the dog's brain.

The features of interest of this experiment are the facts that: 1. There was complete union, through organized connective tissue, of the contiguous portions of the two brains. 2. After seven weeks the cat's brain still maintained enough vitality to be distinctly recognized as brain tissue. 3. Brains of animals of two very different species were thus made to unite. 4. The cat and dog pias presented perfect union as well. 5. There was a sympathetic degeneration of the corresponding convolutions upon the opposite side of the dog's brain. For this curious fact Dr. Thompson can not account. He had never noticed it before, in as many as fifty operations upon this region of the brain of cats and dogs, although he had sometimes seen removal of a part of the occipital region result in extensive softening of the entire hemisphere of the same side. The opposite degeneration in this case may possibly be a mere coincidence; if so, it is a very unusual and remarkable one. There was no meningitis to favor it. 6. There was descending secondary degeneration of the dog's brain on the side of the graft, as is usual in cases of simple excision of brain cortex; hence the cat's cortex had not succeeded in acting as a nutrient centre for the dog's brain.

Dr. Thompson thinks the main fact of this experiment—namely, that brain tissue has sufficient vitality to survive for seven weeks the operation of transplantation without wholly losing its identity as brain substance—suggests an interesting field for further research, and he has no doubt that other experimenters will be rewarded by investigating it.

LETTERS TO THE EDITOR.

Temperature in Storms, and High Areas.

THERE are two classes of cases in which the temperature is higher on Mount Washington than at surrounding stations at a lower level. By far the most frequent of these is when the crest of an anti-cyclone has just passed that locality. For example, on May 22, 1887, at 7 A.M., the temperature on Mount Washington was 58°, with fair weather, and wind velocity 26 miles, from the north-west. At Portland the temperature was 52°, at Boston 56°, at Eastport 44°, at Montreal 44°, the winds being from the south-east and light. The isobar 30.40 was over Nova Scotia, and that of 29.90 was over Lake Superior. On Feb 26, 1887, at 7 A.M., New England was enclosed by the isobar 30.40, a low centre, 29.40, being over Wisconsin. The temperature on Mount Washington was +8°, at Portland +2°, at Montreal −10°, at Albany +8°, and at Eastport +2°. On Feb. 2, 1887, the isobar 30.90 was located directly north of New England, and there was no low centre nearer than Utah and Colorado. The temperature on Mount Washington was +5°, at Portland +4°, at Eastport −3°, at Montreal −10°. On March 6, 1887, the temperature on Mount Washington was 15°, at Portland 14°, at Eastport 15°, and at Quebec 7°. The isobar 30.60 appeared in Nova Scotia. On Dec. 31, 1886, at 7 A.M., the isobar 30.60 was located in Nova Scotia, and that of 29.80 in Tennessee. The temperature on Mount Washington was +9°, at Portland +2°, at Montreal −7°, with winds generally from northerly points except on Mount Washington, where they were from the west. On Dec. 26, 1886, the isobar 30.40 was over Maine, and that of 29.80 over the upper lakes; temperature on Mount Washington +14°, at Portland +10°, at Montreal −2°, at Albany +12°, at Boston +15°. On Jan. 17, 1887, at 7 A.M., the isobar 30.50 was over the maritime provinces, and 29.30 over Michigan; temperature +20° at Mount Washington, +8° at Portland, and +17° at Albany. On Jan. 4, 1887, at 7 A.M., the isobar 30.70 enclosed New Hampshire, southern Vermont, and south-eastern New York. Within these limits at the very crest of the anti-cyclone the temperature on Mount Washington was −1°, at Portland −7°, and at Albany −4°.

Numerous other instances of the kind might be cited, and the list might be greatly enlarged also by admitting cases in which an approach to inversion of temperature was apparent although not fully attained.

The other class of cases in which there has been an inversion of temperature are much more rare and difficult to define, being due apparently to temporary anomalous conditions of one sort or another. For example, on Jan. 10, 1887, at 7 A.M., the temperature on Mount Washington was +10°, at Portland +8°, at Boston +14°, and at Eastport +30°, although a low centre surrounded by the isobar 29.50 was located in Maine. The isobar 30.00 appeared over New Brunswick, as in the previous cases, however, and the isotherms were very much crowded, there being a gradient of 30 degrees between Nova Scotia and New Brunswick. In like manner on Dec. 16, 1886, there was a low centre, 29.50, off the New England coast, and an unusually confused arrangement of the isobars and isotherms toward the north-west, a low centre, 29.80, being over Lake Huron, with the isotherms +50° over Nova Scotia and −10° near Rockliffe, Canada. Coincidentally with this anomalous condition the temperature was somewhat higher on Mount Washington than at surrounding stations.

As a rule, however, increased divergence of temperature betwixt Mount Washington and surrounding stations attends and follows the passage of cyclonic centres. For example, on April 30, 1887, the isobar 29.20 covered portions of Maine and New Hampshire, this being the very centre of the low area. On Mount Washington the temperature was 26°, at Portland 46°, at Boston, 50°, at Montreal 39°, at Albany 43°, gradually decreasing westward to the lake region, where an anti-cyclone was located. On March 25, 1887, at 7 A.M., the centre of a cyclone was exactly over New Hampshire, with pressure 29.20, and temperature on Mount Washington +20°, at Portland +39°, at Montreal +25°, at Quebec +28°, at Boston +46°, at Albany +35°. On Sept. 8, 1887, at 7 A.M., a low centre, 29.40, was at Father Point, Canada, and the barometric trough extended thence south-westward into Maine. At Mount Washington the temperature was 28°, at Portland 60°, at Montreal 54°, and at Quebec 52°. With the distribution of pressure just described, wide divergence of temperature between Mount Washington and surrounding stations is extremely common, and it is not necessary to multiply illustrations. The contrast with the comparative equalization of temperature at