

SECRET OF THE HEATHER

Curious Partnership in Plant Life

GIVE AND TAKE AMONG THE FLOWERS

From a Professor's Chair

Everyone has admired the sturdiness of the heather, and its mastery of exposed mountain-sides and poor soil. But few people know its dark secret.

The heather is not so sturdy and independent as it seems. The fact is that the heather, like a number of its relatives and some other plants besides, is a mutual benefit society of two members.

It lives in the closest possible partnership with a fungus which sends its transparent threads through and through the wiry plant, not only into root and stem, but into leaf and seed-box. The botanists say that the outer coat of the heather seed is infected with the fungus before it leaves the parent plant, and there is no doubt that the heather cannot thrive without its partner-fungus.

A fungus has a great power of absorbing, and the heather's partner-fungus absorbs water and dissolved mineral salts, and also some organic matter from the often peaty soil. It introduces this fluid food into the recesses of the heather, and there is some likelihood—not yet proved to be a certainty—that it is able to fix the free nitrogen of the air, as is done by the partner-microbes that live in the root-tubercles of beans and clovers and other green plants.

Paid in Sugar

But the fungus must get something in exchange from the heather, and that something seems to be sugar. Perhaps the fungus was an injurious intruder to begin with, but the heather has tamed it, so to speak, and has learned, not only to tolerate it, but to make it of great use. The heather and its fungus work hand in hand like partners of a firm.

Botanists are discovering many illustrations of this "living together," or symbiosis, as they call it. Sometimes the fungus forms a feltwork round the roots, as in the case of beech and pine; sometimes, as in the heather, it goes through and through the plant. In the strange bird's nest orchis of our woods the host-plant does not allow the fungus to spread beyond a certain territory where it is useful. When fungus-threads push farther in they are digested by peculiar cells in the orchis, which are in some ways suggestive of our white blood-corpuses.

All these strange cases illustrate the tendency in Nature to link lives together.

LABOUR LOST

What Illness Costs the World

Few of us realise how much work is lost to the world through illness, and therefore how much advantage is lost, for all wise work is useful.

If by carelessness we allow ourselves to be ill, not only do we ourselves suffer, but the world suffers, because it loses the productive work by which we ought to pay for our own living.

It has been calculated that every year 14,000,000 weeks of work are lost to the world through illness. We cannot grasp the meaning of 14,000,000, but, put in another way, it means that every year, through illness, the world loses as much work as would be done through their whole lives by about 7000 industrious men.

The work of 7000 lifetimes—not hours, or days, or months, or years, but lifetimes—is lost every year through sickness, and a very large part of this helpfulness would not be lost if people learned how to be healthy.

FIRE SWEEPS THROUGH A FOREST

Thrilling Sight in Quebec

IMMENSE LOSS OF TIMBER

Great forest fires are reported from the province of Quebec, just when Canada has most need of her timber.

Forests through which railways run are almost certain to be fired sooner or later, and when once alight cannot be put out if the wind is lively.

It is only when the wind is spreading the fire rapidly through the undergrowth that there is danger in a forest fire. On a still day one may stand unafraid within a few yards of blazing trees, the flames all leaping upwards.

The upward rush of the fire, through flaring sap, is swift and impressive, but the onward surge is only felt as the wind sways the flames.

Apparently the Quebec fires have been helped by the winds, as the inhabitants of villages in forest clearings have had to be rescued by trains.

One account tells of scores of women and children brought out of the fire area by a train from Quebec, which pushed through the burning woods. Water was drawn from the tender to quench the flames which licked the coaches as they sped out of the danger zone. Timber valued at a million dollars lay in the path of the fire.

Thousands of acres of precious timber land have also been destroyed by fire in Nova Scotia. See World Map

A NOBLE GIFT

Rich Acres for Learning

The offer of the Government to give the University of London a magnificent site of 11 acres in Bloomsbury, so that the University buildings may be brought together in one dignified group, is worthy of the capital of the British Empire, of the glory of learning, and of the Government that makes the offer.

Until now the University of London has been scattered and lost in London. The ancient university towns are dominated by their universities. London hides her university till not one Londoner in ten thousand knows where it can be traced. All this will be altered if the Government's offer to the Senate of the University is accepted, and the scheme can be carried out.

No better site than the northward continuation of the British Museum could be named. It is central, reasonably public, and reasonably secluded. In the future it should give to Bloomsbury and London an air of learning, as the Inns of Court give to a more eastward portion of London an air of ancient law, and as, still farther eastward, the City creates an atmosphere of finance and commerce.

A NEW LIFEBOAT

And an Old Quibble

More and more this country is governed by officials, and it is likely to be governed by them still more in the future. Yet the official mind is inelastic. It cannot act except by rule; and all its rules, however silly they may be in exceptional circumstances, are sacred to it and must never be broken.

The latest illustration of the official failure to see when rules are silly and wrong and are doing harm, comes in the Board of Trade's treatment of a new lifeboat. This new boat is accepted in America, and, it is believed, would save many lives at sea; but the British Board of Trade will not pass it as certified.

They do not refuse because it is not excellent for its purpose, but because, having a double bottom, it cannot, according to their rules, be called a boat. So it must be neglected, however good it may be and however many lives it might save, until their rules are altered to allow it to be called a boat.

It is this clinging to rules before everything else that makes men distrust the official mind and often fail to appreciate its faithful work.

AEROPLANE WITHOUT WIRES

Will the Monoplane Come Back?

INTERESTING MACHINE WITH REMARKABLE GLIDING POWER

The biplane, an aeroplane with two sets of wings, one above the other, has long been the most favoured type of aeroplane on account of its small span and its great strength compared with the monoplane, a machine with only one set of wings.

The monoplane is likely to come into favour again, however, and M. Fokker, the Dutch inventor, has just produced a machine of this type which is entirely devoid of all outside supports and bracing wires, which have hitherto been proved so necessary to give strength to the wings.

Strength is obtained by means of longitudinal sleepers on to which the wings are built with three-ply wood instead of with fabric. Although the wood wings are necessarily much thicker than fabric, there is considerably less head resistance owing to the absence of all bracing wires, and for the same reason the machine requires less attention.

A cabin is fitted with accommodation for four passengers besides the pilot and the navigator, and, with an engine of only 185 horse-power, a speed of 100 miles an hour is claimed with a full load—a truly remarkable performance for such small horse-power.

Making Flying Safe

Another monoplane with distinctive novel design is now being tested in America. It is called by its inventor, Mr. O. H. Wisenand, of Colorado, a longitudinal aeroplane, having its planes set parallel with the fuselage instead of at right angles or thereabouts, as in all other machines.

It is claimed that by this arrangement head resistance is reduced to a minimum, thereby giving increased speed; while its inventor says that in case of engine failure there is plenty of time in which to choose a landing-place, for the plane has a gliding angle of 1 in 28. This means that if the engine stopped when at a height of a little more than 5000 feet, the level most used for commercial flying, the aviator could choose a landing anywhere within a radius of 28 miles.

So far tests have been carried out only with small models and with a larger machine fitted with a 9 horse-power engine. An engine of 300 horse-power is to be fitted to the larger machine, and it will be interesting to see if the inventor's claims are justified.

WIRES TO HELP WIRELESS

An Old Idea Again

By Our Marconi House Correspondent

From America comes the report of a new discovery called "wired wireless," by Major-General G. O. Squier. Well, all kinds of strange things come from America, and not the least strange are the newspaper reports. For "wired wireless" is by no means a new idea, although the gallant general may have given it a lift.

The principle involved is the use of the high-frequency oscillating currents, as ordinarily employed for wireless, but guided between desired points by means of a wire. The advantage of such a system is that it should permit of what is known as multiplex working—the simultaneous transmission and reception of messages between several stations.

No doubt the method, if it ever becomes practicable, will find a useful sphere, yet it looks like a case of wireless reaching back to give its Victorian relation, ordinary telegraphy, a helping hand.

What the world stands in real need of is not wired wireless but wireless wireless.

THE WEEK IN HISTORY

FAMOUS SLAVE BOOK

King's Grief for His Lost Queen

MAN WHO SAILED WITH CAPTAIN COOK

June 13. First railroad in China opened . . . 1876
14. Mrs. Beecher Stowe born Litchfield, U.S.A. 1811
15. Thomas Campbell, poet, died at Boulogne 1844
16. Bishop Butler, author, died at Bath . . . 1752
17. Edward I. born at Westminster . . . 1239
18. Battle of Waterloo . . . 1815
19. Sir Joseph Banks died at Isleworth . . . 1820

Harriet Beecher Stowe

HARRIET BEECHER STOWE was an American lady who wrote a book that stirred the heart of the world, and gave slavery in America its death-blow. Her "Uncle Tom's Cabin" was translated into 23 languages, and was on the bookshelves of all English-speaking people. It appeared in book form in 1852.

Mrs. Stowe was the daughter of Dr. Lyman Beecher, the principal of a college for ministers, sister of Henry Ward Beecher, the most popular of American preachers, and wife of Professor Stowe. Before and during her early married life she lived at Cincinnati on the river Ohio, only separated by the river from the slave-state of Kentucky, so she saw the horrors of slave-life, and often helped slaves to escape.

What she knew she told in the form of a story, with fine feeling and great power, and so kindled sympathy in millions of minds.

Mrs. Beecher Stowe wrote a number of pleasant stories later, but never found such a moving theme as slavery. She died, respected by all the world, at 84.

King Edward I.

KING Edward I., nicknamed Longshanks, known also as the English Justinian, and, on his grave in Westminster Abbey, as "the hammer of the Scots," was one of our great kings.

His marriage was romantic. He married a Spanish princess, Eleanor, when he was 15. When she died, 36 years later, she had been with him through his adventurous wars, and was reported to have sucked the poison from the dagger-wound given him by an assassin whom he slew in Palestine. So deeply did he grieve for her loss that at every place where her coffin rested, on its way from Lincolnshire to Westminster, he erected a cross, the last being Charing Cross.

Edward's most important work was the founding of the modern English parliament in 1295, and the settlement of our laws, as Justinian had organised the Roman laws.

Edward's wars were many. He conquered Wales, and appointed his eldest son its prince; defeated and slew Simon de Montford and William Wallace, both good men; and claimed and partly enforced a lordship over Scotland, but without securing submission. But though much of his life was spent in quarrels in which he was in the wrong, his wise government at home made him a popular English king.

Sir Joseph Banks

SIR JOSEPH BANKS, a rich English gentleman, who for over 43 years was the President of the Royal Society, gave generously of his money and time in making scientific collections of objects and books, which now belong to the nation, at South Kensington and the British Museum.

Sir Joseph, when a boy at school, was struck by the beauty of flowers, and wondered why they should not be studied as well as duller subjects. He determined to press forward the study of botany, and persisted until it was introduced into Oxford as a voluntary subject.

He equipped the scientific side of Captain Cook's first expedition round the world, and sailed with the great navigator. On his return home, the curiosities he brought, through the assistance of his staff of observers and artists, placed him at the head of the scientific world as it was popularly organised.