## LETTER TO THE EDITOR.

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### Long-tailed Japanese Fowls.

WITH reference to my previous letter on this subject, I should like to draw the attention of the readers of NATURE to a very interesting paper in the *Transactions* of the Asiatic Society of Japan (vol. xxvii. 1900). The writer, Mr. Basil Hall Chamberlain, who has obtained his information from a Japanese fancier, Mr. Kitagawa Ushimatsu, and has also examined the birds himself, states that "there is absolutely no artificial method of making the feathers grow. All is done by selection. Any failure to obtain good results must proceed from having a bad hen, that is, one not of the true breed, and it is in this point that buyers are liable to be deceived. Also one must know how to treat the birds."

The long tail-feathers, Mr. Chamberlain states, grow during the whole life of the bird, which may extend to eight or nine years. If accidentally pulled out they are reproduced. The rate of growth is about four inches a month in young birds, but as much as seven inches in older specimens. The custom of tying up the tail is stated to be a mistaken one, and not to be followed where the birds are bred. The very best specimens are, not unnaturally, kept at home by the breeders in the Tosa province.

The breed is believed to be about a century old, but its origin is unknown. But it seems obvious from the evidence given that it was bred from birds which "sported" in the direction of continuously-growing feathers, as I suggested. Mr. Chamberlain's paper is illustrated by two excellent photographs of cocks of this breed, one of which at least is evidently far superior to the specimens exhibited at South Kensington, remarkable as these are. FRANK FINN.

c/o Zoological Society, 3, Hanover-square.

## PROF. A. F. W. SCHIMPER.

WILHELM ANDRÉ SCHIMPER, who passed away on September 9 in his forty-sixth year, was the great son of an eminent father. Inheriting from his father, the professor of botany, and from the Abyssinian traveller Schimper, a famous name, he made that name yet more famous.

Schimper studied at the University initially, I believe, with the intention of becoming a mineralogist; and his first paper, on proteid crystals (1879), bears the impress of his special training. But this paper, as well as an early one (issued 1880) on a parasitic flowering plant, *Prosopanche*, has been overshadowed by his later achievements.

It was not until the appearance of his paper on the origin of starch (1880) that the botanical world became aware that a young botanist of power and originality had joined it. Before the appearance of this paper the view prevailed that starch-grains were manufactured either by chlorophyll grains or by the general protoplasm. Schimper showed that starch-grains are invariably produced in specialised masses of protoplasm, in chlorophyll grains, or in colourless "starch-builders." Continuing his researches (1880–1885), he, together with Schmitz, proved that chloroplasts, exclusively by division, arise from preexisting ones (or their homologues), but never by a formation *de novo* from the general protoplasm. Schimper further demonstrated the homology of the three classes of chromatophores—leucoplasts (without colouring matter), chloroplasts (with chlorophyll), and chromoplasts (with red or yellow colouring matter). In fact, while other histologists were showing that the plant-cell and animal-cell had two distinct and individualised kinds of protoplasm—cytoplasm and nucleus—Schimper was demonstrating that a third existed, which, like the other two, could produce, and only be produced by, its like. In other words all (or at least nearly all) indubitable animals possess in their cells only two completely distinct kinds of protoplasm, whereas all indubitable plants, with the exception of fungi, and possibly some of the lowest vegetable organisms, have three kinds; and it is to the possession of this third kind of protoplasm—chromatophore-protoplasm—that the plant world largely owes its evolution.

But Schimper's investigations on starch-grains incidentally aided in the inception of another, though minor, revolution in botanical thought. When Schimper commenced his work on the origin of starch, Naegeli's theory of growth of the cell-wall by intussusception was firmly held. Schimper's observations and considerations on the growth of starch grains, and some of Schmitz's observations, were the first blows struck at Naegeli's theory, in favour of growth by apposition, and doubtless they stimulated Strasburger to furnish his masterly case in support of the latter view.

Not to adopt strict chronological order, but to follow Schimper's researches so far as they dealt with pure physiology or histology, the next paper, on the conduction of carbohydrates (1885), was of value, as an exhibition of a strict physiological method, and as an appeal against the alluring and facile method of endeavouring to solve physiological problems solely by histological observations, rather than as a paper containing essentially new physiological views. Schimper's two succeeding physiological papers, on the formation of calcium oxalate in leaves (1887), and the assimilation of mineral salts (1890), were of greater importance. They introduced the method of following by microchemical tests the various inorganic elements in their course from the root to the leaves. Apart from serving as admirable and novel models of physiological research, these papers proved that the leaves are no mere workshops for the manufacture of carbohydrates, but that they are in reality perfectly equipped factories in which the rawest food materials can be, and are, worked up into elaborate proteid compounds, and even into protoplasm. Schimper further showed that chlorophyll, in addition to affecting the decomposition of carbon dioxide and the production of carbohydrates, also in some way influences the reduction of inorganic salts and the production of proteids, apparently in a direct manner.

Despite the value of his contributions to our knowledge of the histology and physiology particularly of green cells, Schimper's fame is possibly wider as the founder of a true method of investigating the "politics," "biology," "bionomics," or œcology of plants.

Though Sprengel, Darwin, H. Müller and others had set so excellent an example in their treatment of questions relating to the pollination of flowers, in other departments of the subject the œcology of plants was mainly a motley array of ill-considered hypotheses, vain phantasies and unfounded conclusions, and by serious botanists the subject was derided as the "romance of botany." Schimper inaugurated a new era. In dealing with problems on the relation between plants and their environments, he insisted that the same thoroughness and precision should be exercised as in investigating morphological and physiological questions.

Schimper's first œcological paper, on epiphytes (1884), was a veritable revelation, magic as a fairy-story in interest, but severely reasoned in substance. In this, and in its final version (1891), it was shown that epiphytes were children of the moist forests, and had arisen as beings that had won a victory in the struggle for light by seizing positions of vantage with very little expenditure of material. Commencing as humble occupants of the soil within the shady forest, epiphytes had in the course of ages laboriously clambered up the trees, striving after the light, and ever struggling against the precarious and fluctuating supplies of moisture and of humus, inventing new absorbing and fixing organs, and contriving fresh devices for resisting threatened death from thirst or starvation, until at length their perilous career was crowned with success and they formed aërial meadows, gardens, shrubberies, and even forests. Schimper showed that the evolution of epiphytes was still reflected in the forest, where the simplest epiphytes lurk low down in moist shaded crevices of the tree trunks, and the more elaborate ones are ranged successively upwards until, even before the tree-tops are reached, perfection is practically attained. Further, he taught how, having emerged into the full blaze of the tropical sun, some epiphytes had sprung across to the savannahs, where they colonised the isolated trees or clothed the nakedness of the bare rocks. And still later he carried the history one step further and revealed some epiphytes flying up to the mountain-tops and others leaping down to the ground near the sea.

The next œcological paper, that on myrmecophilous plants (1888), furnished relatively little that was new, but by the application of a strict method of research it definitely proved views that had been promulgated by that sagacious naturalist, Belt.

The very brief communication on the means of protection against transpiration (1890) was possibly the most suggestive ever issued by Schimper. In it he explained that terrestrial plants living on or near the sea shore, even in saline swamps, or growing inland in the vicinity of salt springs. require to protect themselves against excessive transpiration owing to the difficulty in obtaining a sufficient supply of water with or without salt. Further, he pointed out that Alpine plants in the tropics, at spots where there is no snow, reveal the same xerophilous character as in temperate regions, and it is against desiccation due to exalted transpiration, and not against cold as such, that Alpine plants have to battle. Finally he directed attention to the fact that in temperate regions deciduous trees shed their leaves because they cannot absorb water sufficiently rapidly from the cold soil; whereas evergreen trees can retain their foliage because of the xerophytic structure of the latter. (Though he was not aware of the fact, Schimper was not the actual discoverer of this truth, for I find that Hales appreciated it.) These considerations led to the solution of several geographical problems. They explained how, in temperate and tropical regions alike, Alpine plants may reappear on the sea shore; how, in the tropics, epiphytes reappear as terrestrial plants on Alpine heights, on the sea shore, or near salt-springs. These plants can interchange positions because they are all adapted to resist one danger—excessive transpiration.

In his last œcological paper on a special subject—the Indo-Malayan littoral vegetation (1891)—the principles enunciated in the preceding work were proved and expanded, and other relations between littoral plants and their animate and inanimate surroundings were dealt with. It is impossible to do justice to this paper in a brief note, but it may be mentioned that the important distinction between salt-loving and salt-hating plants was shown to refer, not merely to plants growing on the shores or inland respectively, but to whole orders or cohorts. Littoral plants, then, are salt-enduring representatives that have been driven by competition to the fringe of vegetation, where they have evolved new features in their vegetative and reproductive parts in order that they may exist and spread abroad from shore to shore.

Schimper's last book, a general work on geographical distribution of plants considered from a physiological standpoint, is beyond doubt one of the most illuminating botanical works ever published. No one save a wide traveller, inspired with a deep love for, and close sympathy with, Nature could have written this masterpiece. It was the crowning piece of his life, for Schimper was stricken down in the midst of a new work on island floras.

In conclusion we may say that Schimper revolutionised our ideas as to the fundamental constitution of the unit of plant life, widened and deepened our knowledge of the physiology of green assimilating cells, and, himself in every field in which he worked an earnest advocate, and even inventor, of strict methods of research, he, in particular, took a foremost place in raising up a true science of œcology. Through the passing of Schimper the world of science is darker by the extinction of a light which, if it did not glow with steady incandescence, yet quivered and scintillated with genius.

PERCY GROOM.

## NOTES.

INTRODUCTORY addresses were delivered on Tuesday at several of the London and provincial medical schools, to open the new session. Dr. P. W. Latham, speaking at St. George's Hospital, pointed out that organic chemistry will in time tell exactly what is the composition and constitution of toxins, albumoses, antitoxins, &c., which have proved of service to medicine, and how they may be artificially synthesised in the laboratory. The vegetable alkaloids quinine, morphine and atropine, have been isolated within the last century; and the syntheses of citric acid and indigo have been effected from their elements. The isolation of the animal alkaloids may be more difficult, but it will be accomplished—some have already been obtained, others will follow; the isolation of the antitoxins will be the next chemical triumph, and then will come the synthetical production of these life-saving substances. At University College, Prof. R. Russell begged his hearers to cultivate the spirit of scientific inquiry. Every scientific investigation, if properly conducted, might be expected to disclose some new fact, and this was the only way in which true progress could be made. It was to men of science that every real fresh advance in medicine was due. The so-called practical man could do little more than apply and utilise the discoveries of the investigator. A belief prevalent among some people, that a man could not be both scientific and practical, and that the cultivation of the one spirit must of necessity be at the expense of the other, he regarded as a great fallacy. Medicine and surgery could only be expected to be advanced by a proper commingling of the scientific and the practical, so that scientific principles might find practical application in the elucidation and treatment of disease. At the London School of Medicine for Women, Dr. F. W. Andrewes also referred to the intimate relation between scientific studies and medical practice. He remarked, for instance, that the methods by which pathology is studied are precisely those used in other pure sciences—observation and experiment—and it is this science which is placing medicine and surgery on a scientific basis. It is obvious that a sound knowledge of disease is an indispensable preliminary to its reasonable treatment. At the Royal Veterinary College, Prof. Crookshank discussed the subject of the relation between human and bovine tuberculosis. Dr. A. P. Luff, at the Pharmaceutical Society, commented upon the too general use of powerful drugs in compressed forms, and of proprietary preparations, in the treatment of disease. Addresses were also given by Dr. W. Hill at St. Mary's Hospital, and Dr. T. H. Kellock at Middlesex Hospital.

THE forty-sixth annual exhibition of the Royal Photographic Society was opened to the public on Monday at the New Gallery, Regent Street, and although the greater part of the available space is occupied by exhibits of the artistic and professional kinds, there is an important section devoted to scientific and