I have not seen any reference in the pages of NATURE to the experiments which have been carried on in German laboratories in consequence of Prof. Huizinga's advocacy of Abiogenesis. Dr. Paul Samuelson, experimenting with Huizinga's infusions under the direction of Prof. Pflüger of Bonn, has obtained results which negative the inferences of Prof. Huizinga. Dr. Samuelson's paper appeared in Pflüger's *Archiv*, during the past year, and another experimenter (to whom I am unable to refer explicitly) has obtained equally definite results opposed to the speculations of Bastian and Huizinga.

Paris, Feb. 8 E. RAY LANKESTER

Animal Locomotion

I AM surprised to find that the Duke of Argyll prefers a charge of plagiarism against me in 1874 (NATURE, vol. ix. p. 381), said to have been committed by me in a lecture delivered at the Royal Institution of Great Britain in 1867. As his Grace was present at the lecture in question, and lodged no complaint in writing or otherwise, it appears to me that the charge, if not unfounded and out of place, is at least out of time. As I am not conscious of having perpetrated the plagiarism attributed to me, I wish to apprise your readers that the lecture referred to is published *in extenso* in the Proceedings of the Royal Institution of Great Britain, under date March 22, 1867, and may be consulted by all interested in the present discussion. That I had no wish to appropriate from his Grace, but was, on the contrary, desirous of giving him due credit for what he had done, will, I hope, be evident from the following quotation:—"In order to utilise the air as a means of transit, the body in motion, whether it moves in virtue of the life it possesses or because of a force superadded, must be heavier than it. If it were otherwise, if it were rescued from the operation of gravity on the one hand, and bereft of independent movement on the other, it must float about uncontrolled and uncontrollable, as happens in the ordinary gas balloon. The difference here insisted upon was, I have learned since writing the above, likewise pointed out by his Grace the Duke of Argyll, in his very able and eloquent article in *Good Words*, entitled the 'Reign of Law.' . . . This article, I am glad to find, has been reprinted in a separate form with numerous illustrations, and should be read by all interested in the subject of aëronautics." ("On the various Modes of Flight in Relation to Aëronautics;" Proceedings Royal Institution of Great Britain, March 22, 1867.)

The only passage in the lecture bearing upon the point at issue *is opposed* to his Grace's explanation of the direction of the down stroke of the wing and in accordance with that originally given by me and defended by Mr. Wallace in NATURE, vol. ix. p. 301. *It cannot consequently be regarded as a plagiarism.* The Duke, it will be remembered, contends that the wing of the bird strikes *vertically downwards* during the down stroke. I, on the other hand, believe that the wing, during the down stroke, invariably strikes *downwards and forwards*. In this Mr. Wallace agrees with me. The passage in question runs as follows:—

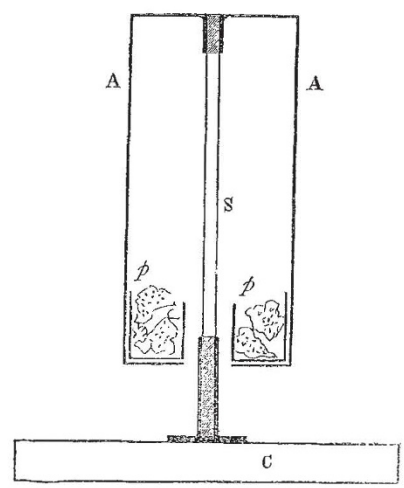
"All wings obtain this leverage by presenting oblique surfaces to the air, the degree of obliquity gradually increasing in a direction from behind *forwards and downwards* during extension, when the sudden or effective stroke is being given, and gradually decreasing in an opposite direction during fluxion or when the wing is being more slowly recovered preparatory to making a second stroke. The effective stroke in insects, and this holds true also of birds, is therefore delivered *downwards and forwards*, and not as the majority of writers believe, vertically, or even slightly backwards. This arises from the curious circumstance that birds, when flying, actually fall through the medium which elevates them, their course being indicated by the resultant of two forces, viz., that of gravity pulling vertically downwards, and that of the wing *acting at a given angle in an upward direction*. The wing of the bird acts after the manner of a boy's kite, the only difference being that the kite is *pulled forwards* upon the wind by the string and the hand, whereas in the bird the wing is *pushed forwards* on the wind by the weight of the body and the life residing in the pinion itself." (*Op. cit.*, March 22, 1867.) The Duke, it is true, compares the expanded motionless wings of a bird when sailing to a kite, while I, as stated, attribute a kite-action to the wings both when they rise and fall. The kite-action in the one instance is, however, not to be confounded with the kite-action in the other. That the wings invariably strike *downwards and forwards* during the down stroke, and *upwards and forwards* during the up stroke, and act as kites in either case, is a matter of observation, but still more of experiment. I have again and again witnessed the movement in the crow, cormorant, wild duck, and other birds, and repeated experiments with natural and artificial wings serve more and more to convince me that what I state is correct. But for the downward and forward and upward and forward curves made by the wings during the down and up strokes, progressive flight would be impossible. The curves in question, when the bird is advancing, unite to form *waved tracks* on either side of the body, thus representing the paths pursued by the vibrating wings in every form and variety of flight.

With regard to the poetical quotation introduced by me in my lecture and alluded to by his Grace, I venture to think that few will regard this as a case of plagiarism.

Edinburgh, March 23 J. BELL PETTIGREW

Electric Experiment

THE following striking experiment to show the rapidity of the influence of sulphuric acid in removing the invisible film of moisture that in ordinary circumstances adheres to the surface of glass and deprives it of its quality as an electric insulator, was recently shown to the Natural Philosophy class in the University of Glasgow by Sir William Thomson, and as it may be interesting to some of your readers, I send you an account of it. The apparatus used were a gold-leaf electroscope, and one of the ordinary table insulators long used in this University, of which the following is a description. A A is a hollow cylinder of brass, the lower part of which can be readily detached, replaced, and fixed in position by a bayonet-joint. The cylinder is supported at the top by the glass rod S, which passes through a circular opening in the bottom of the cylinder and is fixed to the sole plate C. In the lower part is placed a circular canal of lead containing a number of pieces of pumice stone *p p*, which for insulating purposes are moistened with a few drops of strong sulphuric acid. On the previous evening the pumice *pp* was moistened with a few drops of water, the cylinder closed and



left till morning. The experiment was then performed thus The gold leaves of the electroscope were connected with A A by a fine wire and a charge communicated; the gold leaves at first repelled each other, but almost immediately collapsed. This was repeated once or twice, to show distinctly that there was no insulation.

The pumice containing water was then removed, and was replaced by other pieces moistened with sulphuric acid (in both cases the moistening was so little that the pumice had the appearance of being quite dry) and the vessel was closed. As the experiment was made towards the end of the lecture and time was pressing, a warm hand was placed on the side of the insulator to accelerate the drying process by creating connective currents in the air. Whether this hastened the effect or not sensibly it is impossible to say, but the insulation at once began to improve, and in less than five minutes it was shown to be perfect by the gold leaves remaining diverged to their full extent.

The University, Glasgow, March 21 D. M'FARLANE