and we see that, if A = B = C = R, as is the case except in a crystalline medium, the ellipsoid is—

$$R(x^2 + y^2 + z^2) + (Px + Qy + Rz)^2 + (\alpha x + \beta y + \gamma z)^2 = d;$$

so that, if $Px + Qy + Rz = L$, $\alpha x + \beta y + \gamma z = \lambda$.

$L + i\lambda$ and $L - i\lambda$ are the imaginary circular reactions of the ellipsoid,[1] and consequently the intersection of L and λ, whose direction cosines are proportional to $Q\gamma - R\beta$, &c., is the major axis of the ellipsoid, when the above signs are attributed to L^2 and λ^2. As any ellipsoid can be expressed in this form by referring it to its circumscribing sphere and the corresponding planes of circular section, it is apparent that any polarized state of the turbulent motion can be built up of P, Q, R, and α, β, γ, polarizations. The axis of the ellipsoid mentioned above represents the flow of energy in the medium during the propagation of a disturbance.

I am inclined to think that Sir William Thomson's fear that diffusion would vitiate these investigations would be avoided either by supposing the turbulent liquid to consist of interlocked vortex rings, or of infinite intercrossing lines; and in either case a natural hypothesis would be that matter consisted of free vortex rings. GEO. FRAS. FITZGERALD.

Trinity College, Dublin, April 26.

The New Eruption of Vesuvius.

ON April 29, 30, and May 1, a constant series of explosions (*boati*) and rumblings accompanied by earthquakes, which shook the southern foot of Vesuvius, were very noticeable at Resina. About 2 a.m., on May 2, part of the new cone of eruption (formed during the last ten months) fell in, showing that the internal support of the lava column had been removed, in consequence of this filling the new dyke, the formation of which had given origin to the preceding sonorous and mechanical disturbances. On the same day at 3 p.m. the lava sank still lower in the conduit on account of the dyke reaching the surface at the upper part of the great cone. More of the eruptive cone crumbled in, and of course simultaneously a considerable outpour of lava took place from the dyke fissure which is situated on the south-east side of the great cone. This outflow soon formed a long tongue of lava reaching to the Pedimentina or lower.

My friend Mr. George Bidder, Jun., who is studying at the Zoological Station here, was fortunately able to visit the mountain yesterday (May 3), and much of the information in this letter I have to thank him for. Unfortunately the extremely bad weather has prevented the upper part of the mountain being examined, so that accurate information as to the position and length of the fissure has not been obtainable; I hope, however, to make the ascent to-morrow, and will then send a more detailed account for your next issue. So far as the facts at hand are available, it would appear that this eruption is of small importance, being an analogue of that of May 2, 1885, and that, therefore, the lava will hardly reach cultivated ground.

A short glimpse of the summit of the mountain this evening shows that much of the eruptive cone still exists, whilst the reflection from the flowing lava is much feebler than yesterday evening. Lastly, a single faint glimmer this evening at the vent demonstrates the fact that the lava has not sunk very deep in the chimney. The eruption, or more properly *disruption*, was coincident with a marked barometric depression.

Naples, May 4. H. J. JOHNSTON-LAVIS.

The Sailing Flight of the Albatross.

I have been much interested by the letter of Mr. A. C. Baines (NATURE, May 2, p. 9) upon this subject. In the year 1883 ("The Soaring of Birds," NATURE, vol. xxvii. p. 534) I suggested that the explanation of these puzzling performances might be found in the increase of wind with height. To take advantage of this, the bird must rise against the wind and fall with it; but, at the time referred to, I had before me only the observations of Mr. Peal, in Assam, on the flight of pelicans, in which this feature is not alluded to. In Mr. Baines's observations, the omission is supplied, and there seems little reason to doubt that the true explanation of the flight of the albatross has been arrived at. In the case of the pelican soaring to a great elevation, it is less easy to understand how the differences of horizontal velocity can be sufficient.

Reference may be made to a paper by Mr. H. Airy (NATURE, vol. xxvii. p. 590), in which the matter is further discussed. Similar views have also been put forward more recently by an American author, whose name I have, unfortunately, forgotten.

Terling Place, Witham, May 6. RAYLEIGH.

[1] This was remarked to me by Prof. Lyle, of Melbourne, while I was recently speaking to him upon this subject.

"Giphantia."

IN a curious little work, entitled "Giphantia," the full title of which I subjoin, there is, at pp. 95–98, a passage that may have some interest in connection with the early history of photography, and of which I therefore subjoin a copy.

The Camp, Sunningdale, April 29. J. D. HOOKER.

"Giphantia: or, a View of what has passed, what is now passing, and, during the Present Century, what will pass, in the World." Translated from the Original French, with Explanatory Notes. (London: Printed for Robert Horsfield, in Ludgate Street, 1761.)

"Thou knowest that the rays of light, reflected from different bodies, make a picture and paint the bodies upon all polished surfaces, on the retina of the eye, for instance, on water, on glass. The elementary spirits have studied to fix these transient images: they have composed a most subtile matter, very viscous, and proper to harden and dry, by the help of which a picture is made in the twinkle of an eye. They do over with this matter a piece of canvas, and hold it before the objects they have a mind to paint. The first effect of the canvas is that of a mirrour; there are seen upon it all the bodies far and near, whose image the light can transmit. But what the glass cannot do, the canvas, by means of the viscous matter, retains the images. The mirrour shows the objects exactly; but keeps none; our canvases show them with the same exactness, and retains them all. This impression of the images is made the first instant they are received on the canvas, which is immediately carried away into some dark place; an hour after, the subtile matter dries, and you have a picture so much the more valuable, as it cannot be imitated by art nor damaged by time. We take, in their purest source, in the luminous bodies, the colours which painters extract from different materials, and which time never fails to alter. The justness of the design, the truth of the expression, the gradation of the shades, the stronger or weaker strokes, the rules of perspective, all these we leave to nature, who, with a sure and never-erring hand, draws upon our canvases images which deceive the eye and make reason to doubt, whether, what are called real objects, are not phantoms which impose upon the sight, the hearing, the feeling, and all the senses at once.

"The Prefect then entered into some physical discussions, first, on the nature of the glutinous substance which intercepted and retained the rays; secondly, upon the difficulties of preparing and using it; thirdly, upon the struggle between the rays of light and the dried substance, three problems, which I propose to the naturalists of our days, and leave to their sagacity."

Geological Photography.

IN the report of the Annual Conference of Delegates of Corresponding Societies of the British Association (*vide* NATURE, vol. xxxix. p. 187), reference is made to the proposed appointment of a Committee to collect and register photographs of localities, sections, or other features of geological interest in the United Kingdom. Several Societies have already attempted local photographic surveys, but the need is felt to secure uniformity of action by all the Societies interested, and to arrange for the photographs to be available for teaching and other purposes when needed. In order that steps may be taken to arrange for the practical working of the proposed scheme at the forthcoming meeting of the British Association at Newcastle, I am desirous of invoking the kind aid of those of your readers who have interested themselves in the photography of local geological features (especially of typical and temporary sections) in favouring me with the following information:—

(1) A list of photographs already taken, illustrating given localities or sections; and