Taking a single vortex at $z=z_0$ at rest, let

$$w=im\log(z-z_0).$$

Transform by putting $z=f(t)$, and let $z_0=f(t_0)$,

$$\begin{aligned} w&=im\log\{f(t)-f(t_0)\} \\ &=im\log(t-t_0)+im\log\left\{f'(t_0)+f''(t_0)\frac{t-t_0}{2}\ldots\right\} \end{aligned}$$

expanding in the neighbourhood of $t=t_0$, and at the vortex

$$\frac{dw}{dt}=im\frac{d}{dt}\log(t-t_0)+\frac{im}{2}\frac{f''(t_0)}{f'(t_0)},$$

the first part giving the velocity due to the vortex itself and the second the motion of the vortex. The vortex will not be at rest unless $f''(t_0)=0$.

Employing Prof. Bryan's method to obtain a solution giving a vortex at rest in the t plane in the cases considered by him, with the vortex in the z plane not necessarily at rest, we have

$$w=Uz+im\log\frac{z-a-ib}{z-a+ib}$$

$$z=f(t)$$

$$a+ib=f(t_0.$$

Then the velocity at any point is given by

$$\frac{dw}{dt}=\left\{U+\frac{im}{z-a-ib}-\frac{im}{z-a+ib}\right\}f'(t).$$

At the vortex the motion is given by

$$\frac{dw}{dt}=\left\{U-\frac{im}{zib}+\frac{im}{z}\frac{f''(t_0)}{[f'(t_0)]^2}\right\}f'(t_0),$$

omitting the infinite term due to the vortex itself. If the vortex is at rest,

$$U-\frac{m}{zb}+\frac{im}{z}\frac{f''(t_0)}{[f'(t_0)]^2}=0 \quad . \quad . \quad . \quad . \quad (1)$$

and if the velocity at $z=0$ in the z plane vanishes,

$$U-\frac{zmb}{a^2+b^2}=0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

Prof. Bryan's first transformation is $z=t^n$, so the condition (1) becomes, since $t_0^n=a+ib$,

$$U-\frac{m}{zb}+\frac{im}{z}\frac{n-1}{n(a+ib)}=0 \quad . \quad . \quad . \quad . \quad (1)$$

If n is not unity, (1) and (2) give

$$n=\tfrac{1}{4},$$

which lies outside the prescribed limits of n. Consequently no solution of this type can be obtained giving a vortex at rest.

Prot. Bryan's second transformation is

$$Z=\sqrt{c^2+t^2}.$$

Condition (1) becomes in this case, since

$$c^2+t_0^2=(a+ib)^2,$$

$$U-\frac{m}{zb}+\frac{im}{z}\frac{c^2}{(a+ib)\{(a+ib)^2-c^2\}}=0 \quad . \quad . \quad (1)$$

which gives

$$a(a^2-3b^2-c^2)=0 \quad . \quad . \quad . \quad . \quad . \quad (3)$$

$$U-\frac{m}{zb}+\frac{mc^2}{2b\{3a^2-b^2-c^2\}}=0 \quad . \quad . \quad . \quad . \quad (4)$$

Equations (3), (4), and (2) cannot be satisfied by any values of a, b, and m. A solution of the two-dimensional problem of liquid impinging at right angles on a plate of finite breadth with two stationary vortices at the back of the plate and finite velocities at the edges is impossible.

E. H. HARPER.

MR. HARPER is quite right. It would appear from his investigation that it is impossible to apply the transformations in question to fluid motions with stationary vortices, notwithstanding that a vortex transforms into a vortex, and a fluid particle *other than a vortex* which is at rest transforms into a particle also at rest. It is a pity that this fact was overlooked, and that results were consequently published which are of less interest than was supposed at the time.

G. H. B.

The Nutritive Value of Black Bread.

IT appears to me that the contributor of the article on this subject in NATURE of May 5 has overlooked one all-important question, viz. how much of the nitrogen present in each form of bread is actually digested.

I had occasion to look up this question last year, as I happen to be a politician who *is* "particular about his facts," and I agree with your contributor in detesting "allegations," political or otherwise, that are "wanting in scientific accuracy." I referred, accordingly, to Wynter Blyth's "Foods: their Composition and Analysis," and found on p. 173 a table showing "the amount of dry substance, &c., absorbed in percentages of" (*a*) North German black bread (*Pumpernickel*) made of whole rye meal with leaven; (*b*) Munich rye bread, which is a mixture of rye and coarse wheat meal, with leaven; (*c*) white wheaten bread.

The percentages absorbed were:—

	Dry substance	Nitrogen
(*a*)	80·7	57·7
(*b*)	89·9	77·8
(*c*)	94·4	80·1

"It is thus shown," says Wynter Blyth, "that of the black bread a person would have to eat very much more than of white bread." I worked out the corollary of these facts in a letter published in the *Western Daily Mercury* of February 18, 1909, and showed that, on the basis of these analytical results, it would be necessary to eat 8 lb. of *Pumpernickel* to obtain the nitrogenous nutriment afforded by 5¾ lb. of wheaten bread.

My copy of Wynter Blyth's book was published in 1888, and his results are quoted from G. Meyer's experiments. It is, of course, possible that during the last twenty years Meyer's results may have been proved wrong, and that pure rye bread has been proved to yield as much *digestible* nitrogen as wheaten bread yields. Should this be the case, I shall be much obliged by information as to the latest and most trustworthy experiments.

FRANK H. PERRY-COSTE.

Polperro, Cornwall, May 16.

THE criticism is quite to the point, but is not the last word to be said on the subject. It is well known that in the digestion of whole-meal breads there is larger waste; but, on the other hand, if in the initial material there is a greater amount of certain constituents, then, in spite of a larger percentage waste, the actual quantity of these ingredients utilised in the body may be greater. In Rubner's experiments, cited in "Standardisation of Bread. Bread and Food Reform League," this was found to be the case. The percentage of nitrogen absorbed from white flour being 79·93, and that from whole meal being only 69·53, nevertheless the actual amount absorbed from equal weights of the two materials was larger in the case of the whole meal, and this was even more marked with the fat and the inorganic constituents; but at the moment I am unable to find similar analyses relating to black bread itself.

THE WRITER OF THE ARTICLE.

Native Tantalum.

SINCE the communication by Mr. P. Walther regarding native tantalum from the Ural Mountains was published in NATURE of September 16, 1909 (p. 335), another small quantity of a few dekagrams of native tantalum has been recognised in the collection of the deceased mining director, having been collected from the Altai Mountains. It was found in very similar circumstances, and at about the same time, as the tantalum from the Ural Mountains. The difference is in the impurities; the Altai tantalum contains gold from a slight trace to 0·0095 per cent., but no trace of manganese, tin, and niobium could be detected; the latter three have been found in the Ural tantalum. The average percentage of tantalum is 98–99 per cent. The average measurement of the crystals is about 0·1 mm., and the crystals are of the regular system, as in the Ural tantalum. The hardness (between 6 and 7) and the specific gravity (11·2) are the same. The specific gravity mentioned in NATURE of September 16, 1909, has been found too low, the error being due to air bubbles.

Newcastle-on-Tyne. W. VON JOHN.