to allow of the determination of the curvature with considerable accuracy.

Above each figure (and on a scale which makes the long axis of all the eggs equal in length) is the evolute, which is more characteristic than the generating curve itself. The evolutes were produced by drawing normals to the generating curve at many points round the periphery, and though individual normals might in some instances be not quite correctly drawn, there could be no doubt about the shape of their envelope (*i.e.* the evolute). The ρ_L radii for any given latitude were so nearly constant that their variations could not be satisfactorily determined.

I give below, however, a few measures of the greatest and least equatorial diameters of ostrich eggs (too large to be photographed with the apparatus I was using), for in such large eggs, if anywhere, one might expect to find evidence of gravitational deformation.

OSTRICH EGGS.

No.	Locality.	Greatest diameter.	Least diameter.	Difference in parts per 1000.	Remarks.
1	Masailand . .	4·872 in.	4·865 in.	1·4	
2	,,	5·042 ,,	5·021 ,,	4·0	Surface of shell rough.
3	Kilimanjaro .	4·892 ,,	4·890 ,,	0·42	
4	,,	5·290 ,,	5·243 ,,	9·0	Surface of shell rough.
5	Wady Abiadh (?)	4·617 ,,	4·601 ,,	3·5	
6	,, ,,	4·542 ,,	4·535 ,,	2·0	

I have to thank the authorities of the British Museum (Natural History), at South Kensington, for facilities in making these measures.

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Science in South Africa.

EVERY man of science will welcome General Smuts' interesting survey, appearing in NATURE of August 15, p. 245, of the problems that present themselves for solution in South Africa, for there is no more promising field of research, especially in geophysics.

The great astronomical observatories of the southern hemisphere are no doubt already co-operating in a daily comparison of wireless records and celestial observations, which will render it possible to determine in the course of the next few years whether there is at the present time any relative drift of the land masses of the south.

Not less important is a provision for systematic gravimetric observations, similar to those that have been carried out in the United States, Central Europe, India, and what was German East Africa. If these are sufficiently numerous, they will, in conjunction with the work of the Geological Survey, throw important light on the structure of the earth's crust.

At the same time, a number of seismological observatories should be established. The initial cost of the Milne-Shaw apparatus is comparatively small. As the records must be influenced by the geological structure at and near the receiving station, a careful and systematic comparison of the records at different stations of the same earthquakes should be very valuable.

Observations on the tidal movements and others of similar periods in the earth's crust, such as were made by Hecker at Potsdam, are also needed in South Africa for comparison with those in other parts of the world. They, too, will throw light on crustal structures.

For these and other lines of research South Africa affords unequalled opportunities of obtaining important results, and every one must look forward to see her take a place in the commonwealth of science equal to that of the most advanced of older communities.

JOHN W. EVANS.

Transformation of Mercury into Gold.

THE experiments on the transformation of mercury into gold (A. Miethe and H. Stammreich, H. Nagaoka) and the suggested explanation of the process (F. Soddy) lead me to make the following observations. The possibility of the transformation of a nucleus into that of the element next below it by the absorption of one electron is most likely to be detected when both nuclei are stable. This occurs most obviously when the elements have a mass in common, an isobare, and, since even mass-numbers are not found in non-radioactive elements of odd atomic number, an isobare of odd mass-number.

At the present time there is no direct experimental evidence of the existence of isobares of odd mass-number among non-radioactive elements, but there are two cases where the possibility of their existence may be inferred from experimental work. These are the mass-numbers 205 and 199. The existence of the thallium isotope 205 is probable from F. W. Aston's general results for elements of odd atomic number and from the value, 204·4, for the atomic weight; I have given reasons for the existence of the lead isotope 205 (*Phil. Mag.*, 1924, [vi], 48, 365). From the atomic weight of gold, 197·2, it may be inferred that this element has isotopes 197 and 199; mercury, as F. W. Aston has shown, has the isotope 199. There are thus two pairs of elements, lead and thallium, mercury and gold, in which the transformation of the type under discussion may occur. I suggest therefore that the transformation of lead into thallium is as possible as that of mercury into gold, and that the masses of the thallium and the gold produced are 205 and 199 respectively.

There is a possibility that the transformation of lead into thallium by the process under discussion has already occurred in Nature. It has been pointed out by me that when any element of odd atomic number possesses two isotopes, the heavier is never in excess. Thallium did not appear to be an exception to this rule at the time it was made, as its atomic weight was accepted as 204·0 (the masses of its isotopes are assumed to be 203 and 205); it appeared to be one of the elements of odd atomic number like bromine, silver, and antimony, which have isotopes in approximately equal proportions. The new value, 204·4, of thallium's atomic weight, recently obtained, however, makes this element a definite exception. It is possible that the excess of the masses of 205 over those of 203 is the result of a process in Nature of an exceptional kind, for example, of the absorption of an electron by the nucleus of the lead mass 205.

A. S. RUSSELL.

Christ Church, Oxford,
August 12.

Gibbs' Phenomenon in Fourier's Integrals.

FOURIER's integral $\frac{1}{\pi}\int_0^\infty d\alpha\int_{-\infty}^\infty f(\beta)\cos\alpha(\beta-x)d\beta$ is known, under certain general conditions, to have the value $f(x)$ at a point where $f(x)$ is continuous and $\frac{1}{2}\{f(x+0)+f(x-0)\}$ at an ordinary point of discontinuity.