

The method is applicable to freshwater animals, but to find their volume they are placed in a 100 ml. flask and 25 ml. of a 1 per cent solution of glucose added. The concentration of the glucose is easily determined by MacLean's blood sugar test, while the solution of glucose is too weak to have any effect on osmotic pressure. Again, the rate of diffusion of glucose is far too low to have any effect on the tissues except perhaps on naked protoplasm itself.

The density of several living organisms has been determined in this way. Thus the density of the living three-spined stickleback at 10° C. was found to be 1.00286 swimming in Marlborough tap-water with a density of 1.00011 at the same temperature. The density of any living tissue can be determined in the same way provided a suitable Ringer solution is available.

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Salaries in Soviet Universities

THE equivalent figures given in NATURE of December 11, p. 1007, namely, 1100 rouble = £42, are about three times too high on the actual purchasing power of these salaries. Sir Walter Citrine has published a thorough study of prices and standard of living in Russia¹, and finds the purchasing power of the rouble for food and necessities of life is equivalent to 3d. in England. This figure is confirmed by Andre Gide and Trotsky in recent books, and I have myself gone very thoroughly into the matter and would say that for January 1938 this is still not an unfair estimate². On this basis the Russian salaries are as follows:

Directors of chairs in universities	=	average	£190	per annum.
Professors	=	"	£175	"
Senior lecturers	=	"	£120	"

First-year students, at 130 roubles per month, are paid the same as the mass of unskilled workers in Russia, equivalent to 8s. 4d. per week in Great Britain.

The services received free in addition to salary, while not negligible, are, owing to overcrowding, very much curtailed compared with our own as received by the poorer members of the community in England; for example, the schools are usually run in two shifts per day and some even in three shifts.

Of the 542,000 students attending higher educational institutions, probably not as many as 5 per cent approach the standard of training and have the facilities we understand by university education; the rest receiving a training corresponding more to the higher forms of secondary schools, evening classes, etc.

Most of us would be glad to see a rise in the standard of living in Soviet Russia, but at present it is deplorably low, even more as regards wages than salaries.

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¹ "I Search for Truth in Russia", by Sir Walter Citrine (1936).

² Cf. articles in *Manchester Guardian*, "Russia under Stalin—Wages" (Oct. 1937).

Apparent Enlargement of the Sun at the time of Rising and Setting

I HAVE always thought that the accepted explanation of the apparent enlargement of the sun, moon and constellations near the horizon was that we look on the sky as a very shallow inverted bowl, and therefore look on the horizon as very much farther off than the zenith. The sun having the same angular diameter wherever it is seems a larger body when on the horizon because we apprehend it as being much farther off than when in a high altitude.

The experiment described by Mr. Trotter in NATURE of January 15 supports this. It is not necessary to wait for sunshine to repeat it; look at an electric lamp until a retinal after-image is formed; look at a sheet of paper held at reading distance and then hold it at arm's length; the after-image will apparently increase in size.

There is another observation which bears on the same point. I have not seen it described and only noticed it for the first time last summer in Chichester Harbour: look down on to a perfectly still sheet of water at night; the constellations near the zenith look absurdly small; the mind places them on the surface of the water quite close at hand. To me the reflected constellations look only half the size of the real ones in the zenith.

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Axial Spin of Arrows

THE correspondence referring to the feathering of arrows¹ recalls some seen at Parà about the beginning of the century in a collection of various gear and costume of the Amazon Indians. It would seem that these folk liked their arrows to spin, for at any rate some of them were feathered with fairly long narrow feathers, the tips of a pair were bound on opposite sides near the butt and again tied further along the shaft again on opposite sides but with a half turn; so that one feather was on one side at the end and on the other further along. If memory serves me, many of the feathers were those of the 'arà' or macaw, of which, too, were made wonderful helmets or head-dresses.

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¹ NATURE, 140, 1016 (Dec. 11, 1937); 141, 123 (Jan. 15, 1938).

Prof. Alfred Lodge

MAY I add a few words to the obituary notice of Alfred Lodge, written by one whom I count amongst my friends? I had the privilege of being taught mathematics by Alfred Lodge, and although I was a mere boy at the time, I remember distinctly realizing my good fortune in having a teacher quite out of the ordinary. Whereas others taught us the usefulness of mathematics, it was Alfred Lodge who impressed on us its beauty. Under his influence one acquired the attitude towards any problem that it was not completely solved until one had found the neatest solution. Sometimes direct attack on a problem had led to a surprisingly simple result, and I remember how on such occasions Lodge would be asked either by a colleague or by a pupil if he could