in Siberia, and received his earlier education with the Corps of Cadets in Omsk and afterwards at the Michael Artillery School and Michael Ordnance Academy in Petrograd. He was appointed professor of chemistry at the Michael Ordnance Academy in 1899 and held that post up to his arrest. He also held other important posts and was widely consulted and received many honours and decorations, including that of Knight Commander of the Order of St. Michael and St. George from Great Britain

Saposhnikoff's work has been varied and is well known to scientific workers in Europe. Under the Soviet régime he has carried out much work in connexion with the use of petroleum on Russian railways, the danger of fire therefrom and means of fighting it, the impregnation of railway sleepers, etc. His outstanding researches, however, are on the chemistry of explosives and date from the beginning of the present century up to the War. He was not satisfied with the empirical knowledge of the nitration of cellulose and thought that a study of the physico-chemical conditions in the mixed acids used for nitration would throw some light on the question. He therefore measured the vapour tensions of mixtures of sulphuric acid, nitric acid, and water and showed the conditions under which all the water is attached to the sulphuric acid and the nitric acid left free, and also when further addition of sulphuric acid removed the water from the nitric acid, with formation of nitrogen pentoxide. These researches were published in the *Zeitschrift für physikalische Chemie*. From this work, he naturally went on to study the relation between the nitrating capacity of mixed acids on cellulose and their vapour tensions. The chief results were embodied in a paper which he read at the International Congress in London in 1909, entitled "La théorie de la nitration de la cellulose". Much fuller details are given in his paper in the *Journal* of the Russian Physical and Chemical Society. It also appeared in *Zeit. Ang. Schiess. Spreng.* This work has justly been regarded as a most important contribution to the understanding of the nitration of cellulose.

Saposhnikoff employed triangular diagrams very effectively to illustrate his results, and examined, in the light of his theory, the data of Vieille, Bruley, and Lunge as well as his own, giving an illuminating explanation of the results obtained. Indeed, many of his friends look on him as the 'father' of the theory of nitration of cellulose.

It is impossible to refer to all Saposhnikoff's work in this note, although one would like to have dealt with his researches in metallurgy. I can, however, emphatically endorse the statement made in NATURE that the loss which the world suffers through the banishment of such a brilliant scientific worker is disastrous.

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Phenomena in a Sounding Tube.

IN view of Prof. Andrade's recent communication on Kundt's tube effects,[1] the following observations may be of interest. The experiments were carried out in 1927 but have not yet been published. In our case supersonic sound waves were used, and the effects did not differ greatly, contrary to Prof. Andrade's suggestion, from those he obtains with waves of audio-frequency.

A piezoelectric system was used as a source of the supersonic waves, and powerful oscillations of the order of 1 cm. wave-length were radiated along the tube. The effects of these waves on magnesium oxide smoke were investigated. It may be noted at this point that the size of the average smoke particle in the first few seconds of an experiment was of the order of 5×10^{-5} cm. radius or less. Hence the individual particles would presumably take up the motion of the sound waves rather than act as obstacles like the dust particles in Prof. Andrade's experiments.

The first observation of interest was that if one end of the tube were open the smoke was pushed out rapidly. When, however, the ends were closed, the smoke was observed to circulate in a somewhat irregular manner. After a few seconds, large flocculent particles appeared and perfect rings formed on the sides of the glass tube, similar to those obtained with lycopodium in a Kundt's tube, except that they extended right round the tube, becoming a little thinner at the top.

The circulation of the smoke was examined more carefully by means of a parallel beam of light from an arc down the centre of the tube. At times a more or less turbulent motion occurred throughout the length of the tube; at others there appeared to be formed vortices at distances apart corresponding to the nodes, and at these points large flocculent particles were gradually built up owing to the rapid coagulation of the smoke. Some of these large flocks were in rapid rotation about an axis roughly corresponding with that of the tube. They remained suspended in the middle of the tube at the nodes so long as the waves continued. If the waves were stopped, the flocks rapidly settled after a minute or so, and the tube was found to be practically clear of smoke, nothing but well-marked rings remaining.

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Mar. 23.

[1] NATURE, Mar. 21, p. 438.

The Nature of Time.

IN NATURE of Jan. 31, p. 163, F. O. Wollaston and K. W. Miller suggest that time consists of discrete sections: that is, time has an interrupted structure. The element of time is assumed to be equal to h/mc^2, where m is the mass of the electron. In connexion with this subject, it should be noted that a similar idea was put forward by Robert Lévy,[1] and was afterwards worked out more closely by myself,[2] Gottfried Beck,[3] Wilhelm Anderson,[4] and Seitarô Sûzuki.[5] In this way it was possible to establish a range of regularities bearing upon astrophysics and the nature of cosmic rays.[6] These regularities also correspond well with Dirac's [7] theory of protons and electrons. In all these cases, however, it is necessary to take a smaller element of time than that shown above. This elementary interval is equal to h/Mc^2, where M is the mass of the proton.

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Moscow 33, Mar. 24.

[1] Robert Lévy, *C.R.*, **183**, 1026; 1926.
[2] G. I. Pokrowski, *Zeitschr. f Phys.*, **51**, 730, 737; 1928.
[3] Gottfried Beck, *Zeitschr. f. Phys.*, **53**, 675; 1929.
[4] Wilhelm Anderson, *Zeitschr. f. Phys.*, **55**, 386; 1929.
[5] Seitarô Sûzuki, *Phys. Zeitschr.*, **31**, 619; 1930.
[6] E. Regener, *Naturwiss.*, **17**, 183; 1929.
[7] G. T. Pokrowski, *Zeitschr. f. Phys.*, **66**, 129; 1930.

Magnetic Hysteresis on Weber's Theory: A Correction.

I REGRET a slight oversight in my letter published in NATURE of April 25, p. 625. For "OM" should be read "ON, where N is the foot of the perpendicular, Fig. 1, from the intersection of OC and the unit circle".

W. PEDDIE.

Dundee.

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