substituting these values in the relation given by the equation (3) the mobilities for both positive and negative ions were deduced for the corresponding pressures. These mobilities are all collected in Table II and they are plotted in Fig. 3 against the pressures as abscissae.

Mobilities calculated according to the inverse pressure law on the basis of the mobilities for positive and negative ions at atmospheric pressure being respectively 1·34 and 1·89 cm. a second per volt a cm. are also given in Table II. The dotted curves represent the calculated mobilities and the smooth curves the mobilities determined in the present investigation. As both the table and the figure show, the mobilities did not decrease as the pressure rose so rapidly as was demanded by the inverse pressure law. Moreover, it will also be seen from the table and the diagram that the mobility of the positive ion approached that of the negative ion as the higher pressures were reached, the ratio of the mobility of the negative ion to the positive ion dropping from 1·43 at 66·86 atmospheres to 1·31 at 181·5 atmospheres. The departure from the inverse pressure law, however, was not very great.

It will be recalled that Greinacher[1], in his experiments on the ionisation of paraffin oil and of petrol ether by alpha rays, found that the mobilities of the positive and negative ions produced in these liquids were practically identical. In this connection it is interesting to see that our results indicate that very probably the same equality would apply to the mobilities of positive and negative ions in liquid air. Measurements on the mobilities of ions in air at pressures still higher than those used in this investigation would be required, however, to show whether this surmise were correct or not.

In closing we desire to express our appreciation of the services of Mr. P. Blackman, who assisted us in taking many of the readings in this investigation.

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[1]Greinacher. Phys. Zeit., 10 Jahr., No. 25, p. 986.