

the base of the pillars. There are four set screws in the back of the upright block of wood to set out the magnet, so as to make the armature revolve as close as possible to the magnet. The shock is communicated on ordinary occasions by grasping large brass handles which connect with the instrument by short coils of wire, which are painted red. To apply it to different parts of the body long wires, covered with cotton-thread, and terminating in brass balls, are used. Two glass cylinders enclose the wire near the balls, for the operator to hold by while administering the shock.

## ON THE

## COMPOSITION OF PURE AND VITIATED ATMOSPHERES.

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STRANGE as it may appear, the composition of common air is not, even yet, satisfactorily determined, in the opinions of all chemists. According to Dumas, "Ann. de Chim.," iii., 267, the atmosphere consists of oxygen, by weight, 23., azote, 77., and, dividing these numbers by what he has found to be the specific gravities of the gases, he deduces the composition in bulk to be

$$\frac{23}{1.1057} = 20.80 \text{ oxygen, } + \frac{97}{972} = 79.22. \\ \text{Azote.}$$

Calculation, however, shows that the specific gravity of oxygen, according to his data, ought to be 1.1066 or 1.1067; and we believe Dumas considers that the true specific gravity cannot be under 1.107. This is very near Dr. Thomson's number, viz., 1.1111.

Dumas has lately published some experiments, made at Copenhagen, on air taken from the surface of the ocean, where the ratios of the gases vary considerably from these data as follows:—

|           | By weight. | By Bulk.<br>S. g. 1.1111. | By Bulk.<br>S. g. 1.1067. |
|-----------|------------|---------------------------|---------------------------|
| Oxygen..  | 22.58      | 20.3                      | 20.40                     |
| Azote ... | 77.42      | 79.7                      | 79.60                     |

It deserves remark, that the mean of six experiments out of ten, made by Dr. Thomas Thomson (First Principles, i., 98), gave for the composition of air at Glasgow, by bulk—

|              |       |
|--------------|-------|
| Oxygen ..... | 20.42 |
| Azote .....  | 79.58 |

This remarkable coincidence between the composition of the air at the sea, where vegetation is absent, and of that in the oxygen-consuming city, perhaps deserves more attention than has yet been paid to it.

In connection with experiments upon pure air, the trials of Leblanc upon vitiated atmospheres are of high interest. The quantity of carbonic acid in the atmosphere in the normal state has been shown by the Sausures to vary from 3 to 6 parts in 10,000.

Leblanc (Ann. de Chim., v., 223,) has examined the quantity in crowded rooms, theatres, cities, &c. In the hospital La Pitie, the air of one of the wards containing 54 patients, afforded  $\frac{3}{1000}$  of  $\text{CO}_2$ , or 5 times more than that of normal air. Under similar circumstances, at the Salpetriere, the quantity was  $\frac{8}{1000}$ . In Dumas' class-room, after a lecture of an hour and a half, where nine hundred persons were present, the carbonic acid amounted to 1 per cent., and the same quantity of oxygen had disappeared. From other experiments, he considers this a maximum quantity for safety, and strongly recommends a better ventilation when so much carbonic acid is present. This result agrees with experiments made in this country. When the atmosphere is deteriorated by burning charcoal, he has seen death produced when 3 per cent. of carbonic acid was present in the atmosphere. In all such cases of death from stoves, he has found carbonic oxide in the air, and he attributes a deleterious effect to the agency of this gas. He has observed 1 per cent. of this gas to destroy an animal in two minutes, which is at variance with the statement of Nysten. This observation explains many of the inconsistencies which appeared some years ago in the evidence of some London chemists respecting the influence of Joyce's stoves. It is quite obvious that their structure was dangerous. Leblanc found that a candle was extinguished in air containing  $4\frac{1}{2}$  or 6 per cent. of carbonic acid. In such an atmosphere life may be kept up for some time, but respiration is oppressive, and the animal is affected with very great uneasiness. Air expired from the lungs contains about 4 per cent. of carbonic acid, and hence this atmosphere is noxious. Even 3 per cent. in the atmosphere killed birds, and yet we have seen statements which affirmed that upwards of 3 per cent. had been detected in the London theatres. All these facts are pregnant with importance in reference to health. Our miners may not be suffocated by fire-damp explosions, but we should remember that their constitutions may be poisoned by the respiration of tainted atmospheres.—*Proceedings of the Glasgow Philosophical Society*, No. 4.

THE TALK ALL ON ONE SIDE.—Desgenettes had a way peculiarly his own of conducting his inquiries respecting his patients' ailments. He would put a question, but never suffer an answer to be made. If the patient offered to speak, the professor would say, "Your interruption is neither polite nor politic; it is rude to interrupt any one who is speaking to you; and it is unwise, because while am talking all the time that I can spare elapses."