this litre were brought up to the surface, it would expand so that its volume would be increased by 18 cubic centimetres; subtracting the 18 c.c. and weighing the remaining litre we find a weight of 1028 grams. Thus even at a depth of 4000 metres the difference caused by pressure is not great.

Sinking of a solid body.

Now, what is the effect of this increase of density on a solid body lowered into the sea? Let us suppose a piece of solid iron, weighing 1000 grams in the air, to be sent down to 4000 metres at Station 63. When it is lowered just beneath the surface it becomes lighter by 131 grams, thus weighing 869 grams. When it has reached a depth of 4000 metres the buoyancy is 134 grams, so that the piece of iron there weighs 866 grams—a difference in weight of 3 grams for a piece of iron weighing 1000 grams in air. This is merely 0.3 per cent of the weight, and consequently quite insignificant. In other words, metals and other solid substances are practically just as heavy in deep water as they are at the surface, and will sink as rapidly there as in shallow water. This may be proved by direct observation, for if a messenger is sent down to close a water-bottle at a depth of 2000 metres it will be found to take four times as long as when sent down to 500 metres.

Sinking of an air-filled capsule.

But suppose that, instead of a massive piece of iron, we take a perfectly tight capsule of thin iron filled with air, and lower it down to 4000 metres; in the course of the descent the pressure increases, forcing the walls of the capsule together. The volume of air within the capsule may be so large that it only just sinks at the surface, its total specific gravity being then very little greater than that of the water; but when it has reached a depth of 10 metres the air is compressed to half its original volume, granted that the capsule is collapsible, and the weight of the iron then acting more freely, the capsule will sink faster and faster; when it reaches a depth of 4000 metres it is exposed to a pressure of 400 atmospheres, and the compressed air having hardly any buoyancy left, the capsule will sink almost as fast as if it had been made of solid iron throughout. Collapsible solid bodies containing air will accordingly sink faster in deep water than at the surface. A piece of wood floats at the surface because it contains a large amount of air, but there is nothing to prevent it from sinking when it is sent down into deep water; therefore wood and cork are not suitable for floats at great depths. It is the same with the dead bodies of marine animals, etc., for when the air is compressed they will easily sink.