I am inclined to believe that the plankton organisms, under the continually increasing demands of outer conditions upon them from north to south to diminish the rate of sinking, have down to a certain zone, which may perhaps be placed in the Mediterranean area, mainly responded to these demands by an increase in the cross-section resistance. As the species during this process of adaptation approached too near to their limits of variation and the demands for diminishing the rate of sinking still continued, they took to the method of increase in superficial area through decrease in volume; in this way possibly some racial characters disappeared. If this should prove correct, an interesting difference appears between the tropical fresh-water plankton and the tropical marine plankton, which is characterised by its immense formation of spines, processes, etc. The former has met the demand for diminishing the rate of sinking by increase in superficial area through decrease in volume; the latter, by an increase in cross-section resistance by means of an extensive formation of spines, processes, skin-folds, gelatinous membranes, etc.

In all structures tending to increase the cross-section resistance, *i.e.* the temporal variations, I am inclined to see the means by which the organisms try to answer the annual variations in the supporting power of the fresh water in a given locality, and in the increase in superficial area from diminution of volume the means by which the organisms during the distribution in the direction from north to south try to counteract the increasing rate of sinking in the same direction.

It would be in full accordance with this theory if further investigations should prove, on the one hand, that the seasonal variations are only small in the tropics, because there, as well as in the arctic regions, the annual range of temperature in the plankton region of larger lakes is relatively slight; and, on the other hand, that the superficial area, through diminution of volume and rich development of asperities, is greatest, because the supporting power of fresh water, though rather constant throughout the whole year, is less than in any other part of the globe.

These suppositions are only put forward as working theories for future explorers of the tropical fresh-water lakes.

## PART III.—MAIN PROBLEMS OF FUTURE LIMNOLOGICAL INVESTIGATIONS

Sir John Murray has further done me the honour to ask me to indicate here what kind of work I consider most needed at present in the science of limnology. I wish to call special attention to two points.

As already mentioned, we lack almost all knowledge of the tropical