SUMMARY

1. The three lakes *viz.* the Dal, the Anchar and the Manasbal, studied for various hydrobiological characteristics, and primary production, are situated between 34°5' - 34°10' N latitude and 74°8' - 79°9' E longitude, in the valley of Kashmir, at an altitude of 1600 m.a.s.l. There are a number of feeding channels pouring both into the Dal and the Anchar lakes against none in the Manasbal lake.

2. The Dal lake is 10.8 km long, about 2.1 km wide and 6 m deep (the Nagin basin). Its area is 11.45 km$^2$ and its volume is $9.8 \times 10^6$ m$^3$. The Anchar lake is 3.55 km long, about 0.65 km wide and 3.0 m deep. Its surface area is 6.6 km$^2$ and the volume is equal to $3.9 \times 10^6$ m$^3$. The Manasbal lake is 3.5 km long, 1.25 km
wide and 12 m deep (deepest lake). Its area is 2.80 km² and the volume is 8.1 x 10⁶ m³.

3 Some portions of the Dal and the Anchar lakes have been reclaimed for vegetable cultivation and besides these lakes sustain a considerable habitation around them. Bathing, aquatic sport, fishing and harvesting of weeds for different uses are some of the common disturbances that the lakes are subjected to, though the magnitude and type of disturbance, vary from lake to lake.

4 The climate of Kashmir is sub-mediterranean type, with three dry periods. The average monthly precipitation varies from 30-60 mm, with maximum received during winter and spring mainly in the form of snow. Nights are frosty from November to February. Day temperature ranges from 20°C in April to 33°C in July-August.

5 The light penetration values are the highest for the Manasbal lake and the next highest in the Dal against the lowest of the Anchar lake. The extent of light penetration greatly governs the abundance and colonization of deeper water zones by aquatic vegetation.

6 Thermal stratification develops in the Manasbal lake in the summer and lasts for about nine months. The lake goes into full circulation during late November. It behaves both as 'warm-mono' and 'dimictic', type depending on the severity of the climatic conditions during the winter. The thermal gradient is developed during the summer in the Nagin basin of the Dal lake, but no thermocline and hypolimnion are detected. The basin is isothermal from October-March. The Gagribal
basin of the Dal lake remains isothermal all the year round while the Hazratbal basin shows abnormal thermal gradient, probably due to the impact of the feeding channels. The feeding channel profoundly influences the temperature conditions in the Anchar lake as well.

7 There is a great deal of variation in the surface oxygen in all the lakes during the course of the year. Summer oxygen profile in the Manasbal lake shows the clinograde type of curve. The hypolimnionic oxygen deficit has been calculated for summer stagnation period. Bottom water is practically depleted of oxygen during this period. In Nagin, the oxygen profile during the summer develops both the clinograde and the positive heterograde curve. The hypolimnionic oxygen deficit has also been estimated. The oxygen saturation at the bottom falls as low as 14 per cent. The Hazratbal basin and the Anchar lake also show the oxygen gradient, though the Gagribal basin does not develop any oxygen gradient at all.

8 The lake waters are alkaline to highly alkaline at certain periods during the course of the year. There is positive correlation between the alkalinity and the conductivity. The stratification for these is observed in the Manasbal lake in addition to the Nagin basin of the Dal lake.
The lake waters are rich in calcium and poor in magnesium, chloride and sulphate. Phosphates, nitrates, ammonia and silicates are present in very small quantities.

The planktonic populations, in general, remain low, the lakes due to their shallowness, sustaining a rich growth of rooted submerged vegetation. All the life-form classes are, however, represented though in a larger or a smaller measure.

Submerged species have greater coverage than the emergent types though the production is higher in the latter life-form. Annual production is higher for macrophytes and extremely low for the phytoplanktons.

The low phytoplankton production has been attributed to un-availability of certain key nutrients like phosphorus and nitrogen besides an overall low fertility of the lake waters.

The trophic status of the lakes has been discussed at length in regard to a multitudinous number of physico-chemical and production parameters investigated during the course of the present study.