oceanic areas south and north of the Antarctic Convergence. High proportions of unsaturated fatty acids were characteristic of the south area of the Antarctic Convergence and the particulate matter from this area gave fatty acid composition almost identical to that of diatom. Unsaturated fatty acids, however, were found to be much less abundant in the particulate matter from the north area of the Antarctic Convergence and the particulate matter was very different from marine unicellular algae living in this oceanic area in terms of the fatty acid composition. Low nutrient concentration, high water temperature, or a combination of the two in this area was supposed to be the most important environmental factor producing the characteristic fatty acid composition observed in the present study. (p. 85–95)

CHLORINATED HYDROCARBONS IN THE ANTARCTIC, WESTERN PACIFIC AND EASTERN INDIAN OCEANS

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Polychlorinated biphenyls (PCBs) and chlorinated hydrocarbon pesticides such as DDT compounds and HCH isomers were measured in air and surface water samples taken from the Antarctic, western Pacific and eastern Indian Oceans.

All of chlorinated hydrocarbons were detected in every location surveyed. The most interesting finding was their presence in the Antarctic Ocean with measurable concentrations, which indicates their long-distance transport in the global extent.

Both in air and water samples, ΣHCH (sum of α, β and γ isomers) concentrations were higher in the northern hemisphere rather than in the southern hemisphere. On the other hand, higher concentrations of ΣDDT (sum of *p, p'*-DDT, *p, p'*-DDE and *o, p'*-DDT) were found in the tropical regions and its levels between both hemispheres were not so different. These results appear to be the strong proof that the consuming areas of HCH are still concentrated in the northern hemisphere, especially in the Asian Continent, while those of DDT have been shifting from northward to southward for the last decade.

The significantly high concentrations of PCBs were observed in the coastal regions of the tropical and subtropical zones, and PCB components found in these regions were composed of higher chlorinated biphenyls both in air and water samples. In contrast, the lower chlorinated biphenyls were dominant in the oceans far from the terrestrial environment.

The data presented here will be useful for the estimation of persistent chlorinated hydrocarbon fluxes into the marine environment and for the construction of more sophisticated mathematical models of their global atmospheric transport. (p. 97–109)

STANDING STOCK AND DISTRIBUTION OF PHYTOPLANKTON CHLOROPHYLL IN THE SOUTHERN OCEAN, SOUTH OF AUSTRALIA

Yukuya YAMAGUCHI and Yoshiaki SHIBATA

During BIOMASS Cruise of the T/S UMITAKA MARU III to the Southern Ocean, the standing stock and the distribution of phytoplankton chlorophyll were determined in the areas between Australia and Antarctica. Mean surface chlorophyll *a* concentrations in five different water masses, measured continuously by the *in vivo* fluorescence, ranged from 0.118 to 0.385 mg/m^3. Clear diurnal fluctuations of *in vivo* fluorescence, higher in the nighttime and low in the daytime, were observed. Except in the Subantarctic zone in early February, marked subsurface chlorophyll maxima were observed. The amounts of chlorophyll *a* in the subsurface maximum layers were 1.30 to 5.37 times greater than those observed in the surface waters. In the Antarctic zone, most of the subsurface chlorophyll maximum was found in the subsurface temperature minimum layer. The total amount of chlorophyll *a* within the upper 200 m of the water column varied from 12.48 to 50.96 mg/