REVIEWS & NOTICES

The Effects of Stratospheric Pollution by Aircraft, by A. J. GROBECKER, S. C. CORONITI & R. H. CANNON, Jr. 'Report of Findings: Executive Summary' and 'Final Report.' DOT-TST-75-50 December 1974, Office of the Secretary of Transportation, Washington, D.C. 20590, 'available to the public through the National Technical Information Service, Springfield, Virginia 22151': xxvii + 134 pp. + appendixes of 674 pp., [no price indicated], 1974.

A mere 125 Concorde (or Tupolev) SSTs flying only 4.4 hours per day would increase skin cancer cases in the United States by 5,000 per year, according to U.S. Department of Transportation's 'Report of Findings' on 'The Effects of Stratospheric Pollution by Aircraft' which was released 20 January 1975. In the U.S. Congressional debates concerning support for 500 Boeing SSTs in 1971, the late James E. McDonald testified that these aircraft could increase U.S. skin cancer cases by 5,000 to 10,000 per year, and this argument was one feature in the rejection of the Boeing SST. The U.S. Climatic Impact Assessment Program, according to the recent Department of Transportation (DOT) Report of Findings, concludes that 500 Concordes would increase U.S. skin cancer cases by 20,000 per year—far more than expected by McDonald for 500 Boeing SSTs. However, the Department of Transportation finds that large aircraft (such as the Boeing SST), flying at 20 km, cause 4.5 times as much ozone reduction by way of nitrogen oxide pollution as an equal number of Concordes.

In 1971, the undersigned estimated that 1.8 megatons per year of NO_x, inserted at 20 kilometres (the expected pollution from 500 Boeing SSTs as described in 1971), would reduce ozone by 23% as a global average. For this rate of NO_x insertion, the Department of Transportation Report of Findings estimates a 13.5% ozone reduction as a worldwide average, a 17.5% ozone reduction over the northern hemisphere, and a 35% increase in U.S. skin cancer cases (the DOT report did not have the statistics on skin cancers in other parts of the world, hence the emphasis on cases in the U.S.). Within the recognized uncertainties in these estimates, the DOT value of 13.5% and the 1971 value of 23% are to be regarded as good agreement.

In the Report of Findings now under review, the Department of Transportation emphazised that:

1. Thirty Concordes, flying 4.4 hours daily, would not cause noticeable 'Climatic effects'; but they did not openly state that, according to their own figures, these 30 Concordes would increase U.S. skin cancer cases by 1,200 per year. Climatic effects are one thing and health effects are another. Climatic effects concern temperature, rainfall, wind patterns, etc. Health effects concern NO_x increase, ozone decrease, and any increase of biologically damaging ultraviolet radiation. No one ever suggested that 30 Concordes would change the climate, and it is trivial to assert that they won't. Although the health effects can be deduced by a careful reading of the body of the Report, its authors avoided explicit mention of the health effects in their conclusions.
2. Further harmful effects can be avoided if NO_x emissions are reduced by 1980 by a factor of 6, and within another decade or two by a factor of 60, below the current Concorde level; the report did not clearly state that the abandoned Boeing SST would not have had these low-emission engines—nor has the current Concorde.

By virtue of the emphasis on small 'climatic' effects by a small number (30) of Concordes, and by very great optimism that NO_x emissions can be reduced by a factor of 60, the DOT Report of Findings initially created the illusion that SSTs caused less environmental impact than was previously charged.* On the contrary, the technical portions of the Report of Findings fully confirm the environmental impact statements made in 1971, namely, that fleets of a few hundred SSTs could reduce global ozone by a significant amount and would cause a large increase in skin cancers and, probably, damage to other biological systems.

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* The danger of this illusion is illustrated by newspaper articles which we have seen—including one in the *New York Times* of 22 January 1975 stating that this DOT 'three-year study dispels fear that the present fleet of supersonic transports will damage the earth's protective blanket of ozone,' even though 'future expansion of stratospheric jet fleets should be carefully monitored.' (In this connection it is comforting to note that the U.S. Deputy Secretary of Transportation has said that the Ford Administration is not interested in reviving plans for an American SST fleet.) The danger is further illustrated by a letter which we recently received from a North American financier with a PhD in Economics who knows of our biologists' concern and categorically stated that this DOT study 'has determined that there is no effect whatsoever on the ozone layers [*sic*] from supersonic aircraft.'—Ed.

Migration and Survival of the Birds of Asia, by H. ELLIOTT MCCLURE. United States Army Medical Component, South-East Asia Treaty Organization (SEATO) Medical Project, Bangkok, Thailand: vi + 476 pp., illustr., 27.5 × 20.8 × 2.8 cm, [no price indicated], 1974.

R. E. Moreau's brilliant illumination of the 'Palearctic–African Bird Migration Systems' was the product of a lifetime's observation and thought and stands as a fitting memorial to a great ornithologist. The migrations of North and Central America have also been well mapped. But for years that great segment of 120 degrees of Longitude covering Asia remained almost blank. Many different peoples, tongues, religions, political systems, and standards of education, combined with virtual absence of any scientific studies, and no effort at coordination of those that did exist, kept it that way. Today the groundwork has been laid with Dr Elliott McClure's 'Migration and Survival of the Birds of Asia', to which the small band of ornithologists scattered widely over the continent have been able to make their invaluable contributions.

Dr McClure's own contribution was crucial. It was not just of knowledge and organizing ability, but involved also enthusiasm which survived many obstacles and inspired far-flung colleagues. Memories persist of Elliott arriving in a new place, scrambling from the car, binoculars at the ready, and rapping out the names of every bird in sight while everyone else was still fumbling. To a lonely lover of Nature and birds, such a visitor gave heart and incentive.

To the wide range of languages, many with their own scripts, the uncertainty over standard place-names, plus illiteracy and a political situation which limited the participants to those in countries willing to cooperate with an American-sponsored programme, were added the uncertainties of whether any of the rings would be returned and whether adequate information would be supplied. And

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right in the middle of the research area lay the vast blank of China—3.7 million square miles (9,600,000 km²) through which great flights of birds move. A swallow ringed in Karak, Malaysia, returned with a ring indicating that it had been found and marked in Tientsin—the sole and tantalizing evidence of bird movements in China.

Despite all the difficulties, 1,165,288 birds of 1,218 species were ringed by Dr McClure and his collaborators. House swallows predominated, mainly because of the ease with which they could be caught and ringed, but substantial numbers of waders, wagtails, buntings, and sparrows, were included. The total recoveries were over 7,000 of 255 species.

Dr McClure identifies two major fly-ways in Asia, apparently influenced by the Central Asian deserts. There is the East Asian fly-way from Eastern Siberia down through Korea, eastern China, Japan, Philippines, and Indo-China, to Malaysia and Indonesia; and there is the Indo-Asian fly-way west of the Gobi Desert and entering India from the north-west. The westward breeding movement of some species which cling to their old migration routes was indicated by a Yellow-breasted Bunting that was ringed in Finland and recovered in central Thailand.

A curious phenomenon which Dr McClure's teams were able to document is the migration of endemic birds over mountain passes especially on foggy, moonless nights. Netting was carried out at Dalton Pass in Luzon, Philippines, and Fraser's Hill in Western Malaysia, and the catch included small herons, doves, cuckoos, owls, nightjars, kingfishers, flycatchers, and warblers. A similar migration is known at Haflong in north-east India. Local people discovered the movement long ago, and caught birds by attracting them with fires and flares and knocking them down with sticks. They were regarded as an eatable gift of the gods. It is still unclear why these movements take place and, as Dr McClure states, much more study is required on various mountains and passes in the tropics.

Dr McClure provides an interesting study of the possible influences of continental drift and the Pleistocene glaciations on migration. He notes that Moreau felt that Man's impact on the environment in the last 10,000 years could have been the strongest influence on today's migration patterns. But Dr McClure suggests that flight paths show affinities more closely with the gradual approach of India to southern Asia and the rise of the Himalayas. He notes that North American studies demonstrated that the present distribution of species of wood warblers appeared to be directly related to the isolation brought about by glaciation, while the migration routes in Asia fit the pattern of glaciated and non-glaciated areas.

The spur for the migration studies came from interest in the role of animals in the spread of diseases common to various species and to Man. Birds are commonly hosts to arthropods, some of which carry diseases transmittable to vertebrates, including Man—such as Encephalitis and Rickettsias, including Scrub Typhus. The United States Army established the Migratory Animals Pathological Survey (MAPS) in 1963, with Dr McClure as the chief ornithologist. Funds became available for Asian experts, museums, and universities, to carry out studies which they had long desired to do but had been unable to finance in the past.

Dr McClure's work lays a foundation for future studies. In the light of all the difficulties encountered, it is a magnificent effort. It is to be hoped that in the coming years the links established between Asian ornithologists by MAPS will be continually strengthened to permit more cooperative studies, and that Chinese ornithologists will be able to make their crucial contribution.

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Pollution: Selections of the Papers Submitted to the 'Pan Arab Symposium on Pollution' (Cairo, 22–25 April 1972), Edited by G. H. AL-SAMRA. ALECSO Publication: ALECSO, 109 Tahrir Street, Dokki, Giza, Egypt: viii + 193 pp. in English and vii + 166 pp. in Arabic, 27 × 20 × 2 cm (paper covers), [no charge], 1974.

The inner title-page of this book explains that the papers selected for inclusion are concerned with the effects of pollution, its dangers, and the means of protection against it, in the Arab World. There is a Preface by Professor Abdel Aziz El-Sayed, Director-General of ALECSO (the Arab League Educational, Cultural and Scientific Organization), and an Introduction by the Editor, Professor G. H. Al-Samra, Professor of Industrial Medicine in the University of Cairo.

Fifty papers were presented in the Symposium, which was held by ALECSO in preparation for the United Nations Conference on the Human Environment, that took place in Stockholm, Sweden, in June 1972. The papers dealt with various topics related to air, water, and soil, pollution by heat, chemicals, pesticides, radioactive materials, and microorganisms. Control measures were discussed at the national, Arab (regional), and international levels, while among the most important items on the agenda was coordination of efforts within the Arab region and between Arab countries and the outside world.

The present publication contains selections of papers read at the Symposium, giving examples of the problems encountered and of the various points of view expressed. The volume consists of two sections: in the English section, some of the papers appear to be complete whereas only abstracts are published of some others. In the Arabic section, on the other hand, all of the papers appear to be complete, though the same sequence of papers is followed in both sections. At the end of the Symposium, several recommendations were offered which aim at protecting Man and his environment against the dangers of pollution.

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