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Aldabra and the Aldabra Research Station

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Aldabra and the Aldabra Research Station

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This introductory paper describes the history of the Royal Society's involvement with Aldabra since 1966. After an initial expeditionary phase in 1967–9, the Society built the Aldabra Research Station and planned a series of scientific studies centred on the giant tortoise. A revised place-name map of the atoll is provided to serve as background to the discussion.

The Royal Society's involvement with Aldabra dates from 1966, when on behalf of the Southern Zone Research Committee Dr C. A. Wright of the British Museum (Natural History) and I were attached to a B.B.C. and Ministry of Defence party going to the atoll to study the feasibility of constructing an air staging post there. As a result of that visit and subsequent discussions, the Society convened a conference of interested scientific and conservation bodies in January 1967, at which it was concluded that the proposed developments were incompatible with the preservation of the ecology of Aldabra. In April 1967 the Society prepared a memorandum which stated that 'if development takes place at Aldabra the loss to science will be permanent', and argued that the major contribution that the study of the atoll could make to science could only be made by its total preservation for long-term studies. Thus began what came to be known as 'the Aldabra affair' (Stoddart 1968*a*, *b*).

In anticipation of a Government decision to build the staging post, the Society began a major expedition to Aldabra in August 1967. In the event this lasted until September 1969, and involved some 50 people and about 14 man-years of field investigation. Its initial aim was to make as full an inventory as possible of the terrestrial and marine features of the atoll before development began. Its methods were thus necessarily rapid and aimed at speedy results, and large collections were made, especially of plants and invertebrates, which continue to provide material for study. In addition the Expedition was concerned to document distributions of plants and animals and to estimate population levels, especially in the airfield area at the eastern end of Grande Terre. But within a few months of the start of the Expedition (in November 1967) the Government abandoned its defence proposals, and it became possible to plan the study of Aldabra in a more comprehensive manner.

The Society then decided to build a small Research Station on the atoll, to provide for longer-term scientific research, and the Aldabra Research Committee was set up under the chairmanship of Professor T. S. Westoll, F.R.S., to coordinate this work. In August 1968 Professor Westoll, Dr M. E. D. Poore of the Nature Conservancy, and I visited Aldabra, chose a site for the Research Station, and laid out a preliminary plan of the buildings. We afterwards went on to Mahé and discussed with the Government of Seychelles the practical problems that would be faced during construction.

The first Director, the late Lt Cdr G. R. Lush, R.N., M.B.E., was responsible for building the Station during 1969–71. It proved a much longer and more difficult process than originally

envisaged, but at the end of the day the Society had a large, sturdy and well equipped centre for research. It included main laboratory and accommodation blocks, additional living quarters, stores, a workshop and boatshed, generators giving continuous power, and both rainwater tanks and solar stills (figure 2). In addition there is a network of field huts around the atoll. The whole complex was declared open on 30 June 1971. Most of the cost of building and operating the Station has been carried by the Society's Parliamentary Grant-in-Aid, though with additional support from the National Academy of Sciences, the Smithsonian Institution, and the World Wildlife Fund. In addition to the actual construction the Society was also concerned with other safeguards. The lease of Aldabra from the Seychelles Government had been held for many years by Mr Harry Savy of Mahé. Mr Savy had been extremely cooperative throughout our earlier involvement, and in August 1971 the Society was able, with generous financial help from Mr Christopher Cadbury, to take over the lease itself. This runs to 1985, with optional extension. Efforts were also made to define adequate conservation measures for the atoll under the laws of the British Indian Ocean Territory, of which Aldabra formed a part from 1966 to 1976.

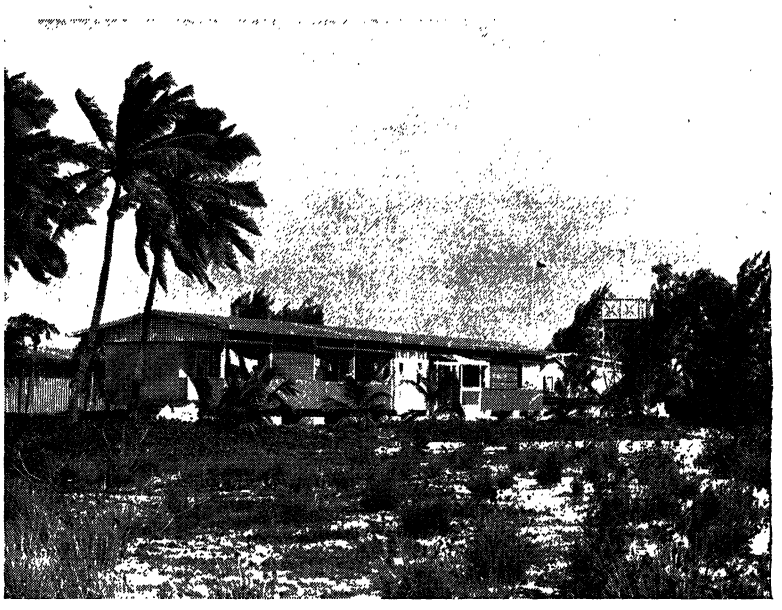

FIGURE 1. The Aldabra Research Station from the northwest.

Thus, when the first Discussion Meeting on Aldabra was held in March 1969 (Westoll & Stoddart (eds) 1971), most of our knowledge was of a preliminary or indeed reconnaissance kind. The Expedition itself was still continuing, and the work of building was soon to slow down the pace of scientific research for several months. Once the Station was complete, however, a new programme began under guidelines adopted by the Aldabra Research Committee in 1970 and revised in 1973. These called for the completion of certain types of inventory work already begun (for example on the plants and insects), for basic surveys in geology and geomorphology, and for the establishment of a meteorological station which now operates to World Weather Watch standards. They also specified a series of priorities in scientific research, the most important of which was the study of the tortoise population, initially concentrating on

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population dynamics, distribution and movement. Studies of land birds, including several of the passerines as well as the flightless white-throated rail, came second, followed by an array of other terrestrial topics. The existence of this scale of priorities was not intended to inhibit other types of study, notably on the marine ecology in which a start had been made during the Expedition (Stoddart & Yonge (eds) 1971), but the Committee took the view that if such wide-ranging studies were to be manageable they also had to be managed. Finally the Natural Environment Research Council financed the establishment of an Aldabra Data Unit housed in the Department of Zoology, British Museum (Natural History), under the direction of J. F. Peake, to standardize field observation and to organize and make accessible the results (Peake, Sinclair & Lomas 1978).

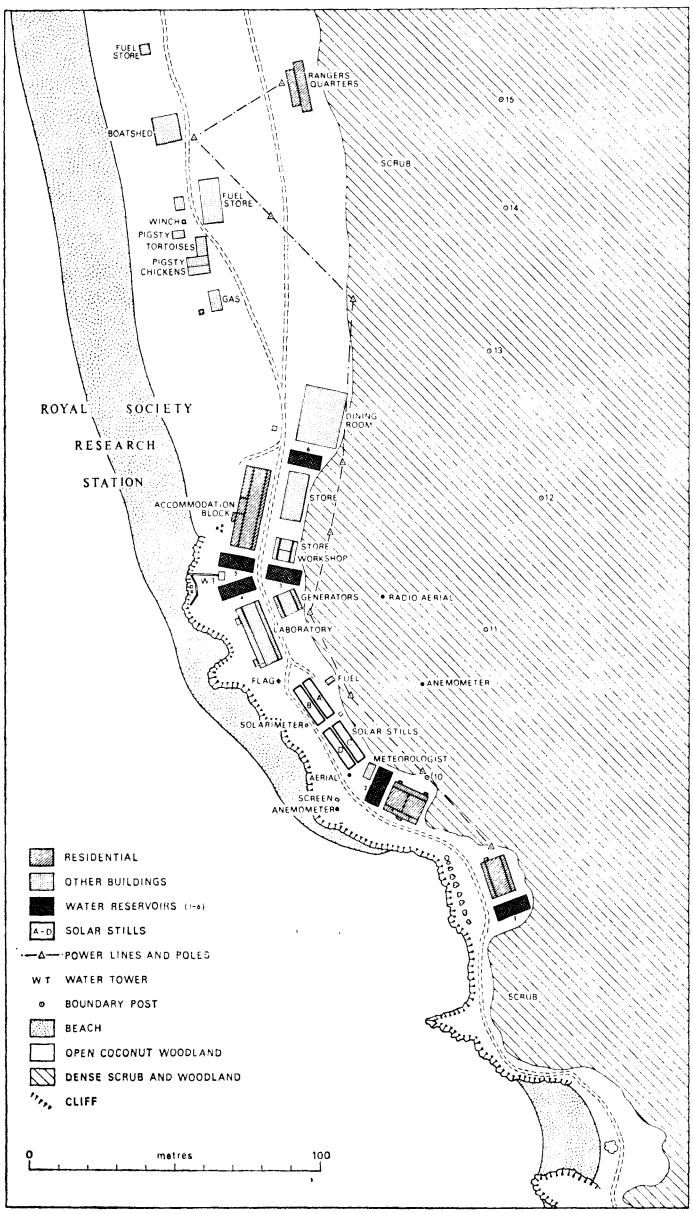

FIGURE 2

Table 1. Staff and Visitors at the Royal Society Aldabra Research Station, February 1969 to March 1980

name	institution at time of visit	time	field
Alexander, Dr H. G. L.	Department of Natural Sciences, South London College	Aug. 1971–Aug. 1972, Jan.–Mar. 1978	land crabs
Anderson, F. F.	The Divinity School, Duke University, U.S.A.	June–Oct. 1976	goats
Blackmore, Dr S.	Station staff	Dec. 1976–Nov. 1977	administrative officer
Blackmore, Mrs P. J. M.	—	Dec. 1976–Nov. 1977	
Bone, D. G.	Station staff	Sep. 1971–Dec. 1972	administrative officer
Bone, Mrs Sally Elisabeth	—	Sep. 1971–Dec. 1972	
Bourn, D. M.	Department of Zoology, University of Oxford	Dec. 1972–Sep. 1974	tortoise population dynamics
Braithwaite, Dr C. J. R.	Department of Geology, University of Dundee	June–Sep. 1969	geology
Bruce, Dr A. J.	East Africa Marine Fisheries Research Organisation, Zanzibar	Feb. 1972	Crustacea
Bruce, R. W.	Department of Zoology, University of Glasgow	Oct 1975–Aug. 1976, Nov. 1977–Jan. 1978	parrot fish
Busby, J. P.	Edinburgh College of Art	Jan.–Mar. 1974	wildlife painting
Butterfield, M. R.	Station staff	May 1975–Apr. 1976	meteorologist
Cause, Cpl. R.	Royal Engineers	Oct. 1969–Feb. 1970	station construction
Chelazzi, Dr G.	Istituto di Zoologia, University of Florence, Italy	Jan.–Mar. 1979	orientation and migration of coenobites and *Nerita*
Chivers, I. G.	Institute of Oceanographic Sciences, Bidston Observatory	May–June 1975	tide gauge installation
Coe, Dr M. J.	Department of Zoology, University of Oxford	Sep. 1974, July 1978	tortoises
Cowx, W. D.	Station staff	Mar. 1978–Mar. 1980	officer-in-charge
Dale, P. F. and student party	Department of Geography, University of Cambridge	June–Aug. 1970	topographical survey
Diamond, Dr A. W.	Department of Zoology, University of Aberdeen	Mar.–Sep. 1969	sea bird ecology
Donaldson, A.	Department of Botany, University of Durham	Oct. 1972–June 1973	terrestrial and freshwater algae
Edwards, G.	Anglia Television Ltd	Sep.–Nov. 1970	cine-photography
Edwards, Ms Kimberly	—	July 1975–Nov. 1976	scientific field assistant
Forbes-Watson, A. D.	National Museum, Nairobi, Kenya	Sep.–Oct. 1974	land birds
Forster, G. R.	The Marine Laboratory, Plymouth	Mar. 1971, Nov. 1977–Jan. 1978	long line fishing
Frazier, Dr J. G.	Department of Zoology, University of Oxford	June 1969–June 1970	tortoise behaviour and ecology
Fricke, Dr H.	Max Planck Institut, Seewiesen, F.R.G.	July–Sep. 1975	anemone fish
Fricke, Mrs Simone	—	July–Sep. 1975	
Frith, C. B.	Station staff	Apr. 1972–Apr. 1973	junior staff scientist; land birds
Frith, Dr Dawn W.	Department of General Education and Science, Brooklands County Technical College	Aug. 1971–Aug. 1972	terrestrial invertebrates
Gallsworthy, J. M.	Station staff	Oct. 1975–Jan. 1977	station director
Gaymer, Dr R. D. T.	Department of Zoology, University of Bristol	June–Sep. 1969, June–Aug. 1970	tortoise marking

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TABLE 1 (*cont.*)

name	institution at time of visit	time	field
Gibson, Dr C. W. D.	Station staff	Nov. 1976–Jan. 1979	staff scientist: tortoise/vegetation interaction
Gibson, Mrs Julie	Department of Zoology, University of Oxford	Nov. 1976–Jan. 1979	tortoise feeding
Gibson, T. S. H.	—	May 1975–Apr. 1976	scientific assistant
Gillham, Dr Mary E.	Department of Extra-Mural Studies, University College of South Wales and Monmouthshire	Feb.–May 1970	seabird/vegetation interaction
Gould, Ms Margaret S.	Department of Zoology, Duke University, U.S.A.	June 1976–Sep. 1977	goats
Griffin, D. J. H.	Royal Society	Aug.–Sep. 1973	administrative visit
Grinter, J.	—	Feb.–June 1969	assistant
Hartnoll, Dr R. G.	Department of Marine Biology, University of Durham	Feb.–Mar. 1979	land crabs
Hemmen, G. E.	Royal Society	Apr. 1970	administrative visit
Hill, Dr M. G.	Department of Zoology, Imperial College	Nov. 1976–Nov. 1978	coccid/plant relationships
Hnatiuk, Dr R. J.	Station staff	Feb. 1973–Oct. 1974	senior staff scientist/ director: vegetation
Hnatiuk, Dr Sarah	—	Feb. 1973–Oct. 1974	spp. distribution on lagoon islets
Huxley, C. R.	Sub-department of Ornithology, British Museum (Nat. Hist.)	Aug. 1973–Apr. 1976	flightless rail
Johnston, D. R.	Royal Engineers	Oct. 1969–June 1970	station construction
	Station staff	Apr. 1973–Nov. 1975	station engineer
Kennedy, Dr W. J.	Department of Geology, University of Oxford	June–Sep. 1969	geology
Klopfer, Prof. P. H.	Department of Zoology, Duke University, U.S.A.	Dec. 1976–Jan. 1977	goats
Klopfer, Mrs Martha	—	Dec. 1976–Jan. 1977	
Lawson, D.	Station staff	Mar. 1978–July 1979	meteorologist
Lewis, Prof. D.	Department of Botany, University College, London	Aug. 1971	*Pemphis* heterostyly
Lush, Lt Cdr G. R.	Station staff	Oct. 1969–June 1971	station director
Lush, Mrs Janet H.	—	Oct. 1969–June 1971	
Lythgoe, Dr J. N.	M.R.C. Vision Unit, School of Biology, University of Sussex	Feb.–Mar. 1971	photography/visual pigments of reef fishes
Merton, L. F. H.	Department of Botany, University of Sheffield	Aug.–Sep. 1973, July–Sep. 1974	vegetation
Mole, L. U.	Royal Society	Sep.–Oct. 1969, Oct.–Dec. 1972, July–Oct. 1975 July 1976, Jan.–Mar. 1978	administrative visits
Morrison, R. C.	Station staff	Apr. 1977–Mar. 1978	meteorologist
Muntz, Dr W. R. A.	Laboratory of Experimental Psychology, University of Sussex	Feb.–Mar. 1971	visual pigments and schooling of coral fishes
Nelson, Dr J. B.	Department of Zoology, University of Aberdeen	Jan.–Mar. 1974	sea birds
Newberry, Dr D. McC.	Department of Zoology, Imperial College	Nov. 1976–Jan. 1979	coccid/plant relationships
Niedzwiedzki, P. S.	Station staff	Dec. 1976–Nov. 1977	senior staff scientist/ director: fat storage in lizards

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TABLE 1 (*cont.*)

name	institution at time of visit	time	field
Niedzwiedzki, Mrs Margaret A.	—	Dec. 1976–July 1977	
Peake, J. F.	Department of Zoology, British Museum (Nat. Hist.)	Sep.- Oct. 1974	administrative visit
Peet, C. J.	Station staff	Mar. 1976–Sep. 1977 Apr. 1978–Mar. 1980	scientific assistant officer-in-charge
Penny, M. J.	The Wildfowl Trust, Slimbridge	Mar.–June 1969	wading birds
Pettigrew, J. J.	Meteorological office	Apr. 1976–Apr. 1977	meteorologist
Phillipson, Dr J.	Department of Zoology, University of Oxford	Apr. 1977	primary productivity
Polak, T. A.	Churchill College, Cambridge	July–Sep. 1978	station engineer
Polunin, N. V. C.	Department of Zoology, University of Cambridge	July–Oct. 1975	reef fishes
Porteous, Dr A.	Department of Mechanical Engineering, University of Glasgow	May–June 1970	solar still installation
Potts, Dr G. W.	The Marine Laboratory, Plymouth	Nov. 1977–Jan. 1978	predatory fishes
Potts, Dr M.	Department of Botany, University of Durham	Nov. 1974–June 1975	blue-green algae
Povey, D. I.	Station staff	June 1977–Mar. 1980	station engineer
Prŷs-Jones, O. E.	Department of Applied Biology, University of Cambridge	Oct. 1976–Jan. 1977	land birds
Prŷs-Jones, Dr R. P.	Sub-department of Ornithology, British Museum (Nat. Hist.)	July 1974–Feb. 1977	land birds
Pugh, Dr D. T.	Institute of Oceanographic Sciences, Bidston Observatory	May–June 1975	tide gauge installation
Reinboth, Prof. R.	Institut für Zoologie, Johannes Gutenberg-Universität, F.R.G.	July–Aug. 1975	sex changes in fishes
Renvoize, S. A.	Royal Botanic Gardens, Kew	May–June 1975	coccid/plant relationships
Reville, B. J.	Department of Zoology, University of Aberdeen	Jan. 1976–Jan. 1978	sea birds
Robertson, Dr D. R.	Smithsonian Tropical Research Institute, Panama	July 1975–Jan. 1976	reef fishes
Rutter, Prof. A. J.	Department of Botany, Imperial College	Apr. 1977	coccid/plant relationships
Schmidt, Dr H.	Zoologisches Institut der Universität Heidelberg, F.R.G.	Oct.–Nov. 1975	sea anemones
Shapiro, Dr D. Y.	Department of Zoology, University of Cambridge	July–Oct. 1975	sex changes in fishes
Shapiro, Mrs Milbrey	—	July–Oct. 1975	
Sinclair, Ms Amanda J.	Department of Zoology, British Museum (Nat. Hist.)	Sep.–Oct. 1974	data processing
Sloan, Dr N. A.	Department of Zoology, Queen Mary College	Nov. 1977–May 1978	echinoderms
Smith, A.	Station staff	Oct. 1969–Apr. 1971	station construction
Smith, Mrs Kathleen	—	Oct. 1969–Apr. 1971	
Smith, G.	Station staff	June 1970–May 1971	station engineer
Snow, Dr D. W.	Sub-department of Ornithology, British Museum (Nat. Hist.)	Sep.–Oct. 1974	land birds
Spaull, Dr V. W.	Station staff	Oct. 1973–May 1975	staff scientist: soil and freshwater invertebrates
Stevens, Dr J. D.	The Marine Laboratory, Plymouth	Nov. 1977–Nov. 1978	sharks
Stevenson, J. A.	Station staff	Aug. 1970–Apr. 1972	junior staff scientist
Stickley, H. C.	Station staff	Feb. 1971–Apr. 1973	station engineer

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TABLE 1 (*cont.*)

name	institution at time of visit	time	field
Stoddart, Dr D. R.	Department of Geography, University of Cambridge	Apr. 1970, July 1976, Dec. 1976, Apr. 1978, July 1979	administrative visits and accompanying President of Seychelles
Swingland, Dr I. R.	Department of Zoology, University of Oxford	Jan. 1975–Nov. 1976	tortoise population dynamics
Taylor, G. C. M.	Meteorological Office	Mar. 1976–Nov. 1977	meteorologist
Taylor, Dr J. D.	Department of Zoology, British Museum (Nat. Hist.)	June–Sep. 1969, Aug.–Oct. 1973	intertidal ecology
Topliffe, F. W.	Station staff	Oct. 1972–July 1975	station director/ administrative officer
Topliffe, Mrs Lorise C.	—	Oct. 1972–July 1975	data processing
Trudgill, Dr S. T.	Department of Geography, University of Bristol	June–Sep. 1969, Mar.–May 1971	limestone solution/ soils
Turner, G. C.	Meteorological Office	Nov. 1977–Nov. 1978	meteorologist
Vannini, Dr M.	Istituto di Zoologia, University of Florence, Italy	Jan.–Mar. 1979	orientation and migration of coenobites and *Nerita*
Walker, J.	Station staff	Dec. 1975–July 1977	station engineer
Walker, Mrs Marilyn	—	Dec. 1975–July 1977	
Waloff, Dr Nadia	Department of Zoology, Imperial College	Apr. 1977	coccid/plant relationships
Whitelaw, J. J.	Station staff	Jan. 1977–Mar. 1978	staff scientist: rats
Whitton, Dr B. A.	Department of Botany, University of Durham	Mar.–Apr. 1973, Dec. 1974–Jan. 1975	blue-green algae
Wickens, Dr G. E.	Royal Botanic Gardens, Kew	July–Sep. 1974	vegetation
Wilderspin, R. C.	Meteorological Office	Jan. 1975–Mar. 1976	meteorologist
Williams, Dr Carol A.	Department of Geodesy and Geophysics, University of Cambridge	June–Aug. 1970	gravity measurements
Wilson, J. R.	Station staff	Apr. 1973–Oct. 1974	junior staff scientist: waders
Wilson, Mrs Jane R.	—	Oct. 1973–Oct. 1974	
Wood, Dr D.	Station staff	Sep. 1971–June 1972	director: phenology
Wood, Mrs Jane	—	Sep. 1971–June 1972	
Woodell, Dr S. R. J.	Department of Botany, University of Oxford	Jan.–Mar. 1974	pollination and seed dispersal
Woodell, Mrs Rebecca	—	Jan.–Mar. 1974	coucals

Allowing for funding difficulties and logistic delays, research proceeded smoothly. In addition to the 14 man-years represented by the Expedition, a further 34 man-years were invested from 1970 to March 1977, giving a total to that date of nearly 50 man-years. A list of investigators during phases I–VI of the Expedition was given by Stoddart (1971 *a*, table 2), and this is brought up to date and extended to March 1980 in table 1. Aldabra is now among the best known oceanic islands and coral atolls on Earth. More than this, the work has confirmed the initial judgement of the Southern Zone Research Committee and the Aldabra Research Committee that Aldabra is a scientific resource of unique interest and importance. The core of its significance lies, of course, in the population of some 150 000 giant tortoises living in remarkably undisturbed conditions. But it has also become apparent that the interest resides not only in the study of individual components of the ecosystem but in the elucidation of the often complex linkages between them and of the relations between the biota and a variety of environmental factors varying on different spatial and temporal scales.

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The time when the Royal Society will cease to have prime responsibility for operating the Research Station and conserving the atoll is now approaching. Under present plans it is hoped to hand over these functions to another body by March 1980. The independent Republic of Seychelles, which came into being in June 1976 and which has sovereignty over Aldabra, continues to show great interest in the project and an awareness of both the potentialities and the difficulties of maintaining the atoll as a resource for science. We hope that this meeting will not only demonstrate some of the new insights into the terrestrial ecology of Aldabra gained over the last decade, but will also help to provide a basis for sound conservation measures in the future.

A brief introduction to the major features of the topography and ecology of Aldabra has been given by Stoddart (1968*b*), and will not be repeated here. Location on the atoll itself, however, still remains something of a problem. A revised version of the place-name map published in 1971 is reproduced as a pullout at the end of this publication.† It represents a cooperative effort by Aldabrans, notably R. J. Hnatiuk, S. Hnatiuk, I. R. Swingland and R. Prŷs-Jones, largely coordinated by G. C. M. Taylor, and it should serve as a background to the papers that follow.

I cannot close this brief introduction without a word of acknowledgement. The Society's initial involvement in Aldabra and the decision to build the Research Station largely resulted from the interest of the late Lord Blackett, of Sir Ashley Miles, and of the late Sir David Martin. The subsequent management of Aldabra affairs – often seemingly a thankless task – has been guided by Professor T. S. Westoll as chairman of the Aldabra Research Committee, and by other senior Committee members, notably Dr F. C. Fraser, Professor D. Lewis and Professor W. H. Thorpe. The Station itself has been in the hands of a succession of Directors: the late Lt Commander Lush, Dr David Wood, Dr Roger Hnatiuk, Mr Fred Topliffe, Mr John Gallsworthy, and Mr Paul Niedzwiedzki. The whole operation has been serviced by the Royal Society's office staff, notably by Mr L. U. Mole, Mr D. J. H. Griffin and Mr G. E. Hemmen, all of whom have spent varying periods on the atoll. But above all, thanks are due to our long line of visitors and residents on Aldabra. Our Europeans and Americans have worked in lonely, difficult and occasionally hostile conditions to achieve the results we are about to discuss, and whatever they have done has been made possible by the strength, loyalty and good humour of Antonio Constance (Mazarin), Harry Charles, and Georges Larue and our other Seychellois Aldabrans. In spite of what has been done over the last 10 years, however, I think it will be felt at the end of this Discussion that even in so simple a system as that of Aldabra we have now only reached the stage where the truly interesting questions can be defined, and I hope it will be possible to look forward to several decades more of continuing research and conservation on this remarkable island.

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† Some contributors to this volume use names from the 1971 map.

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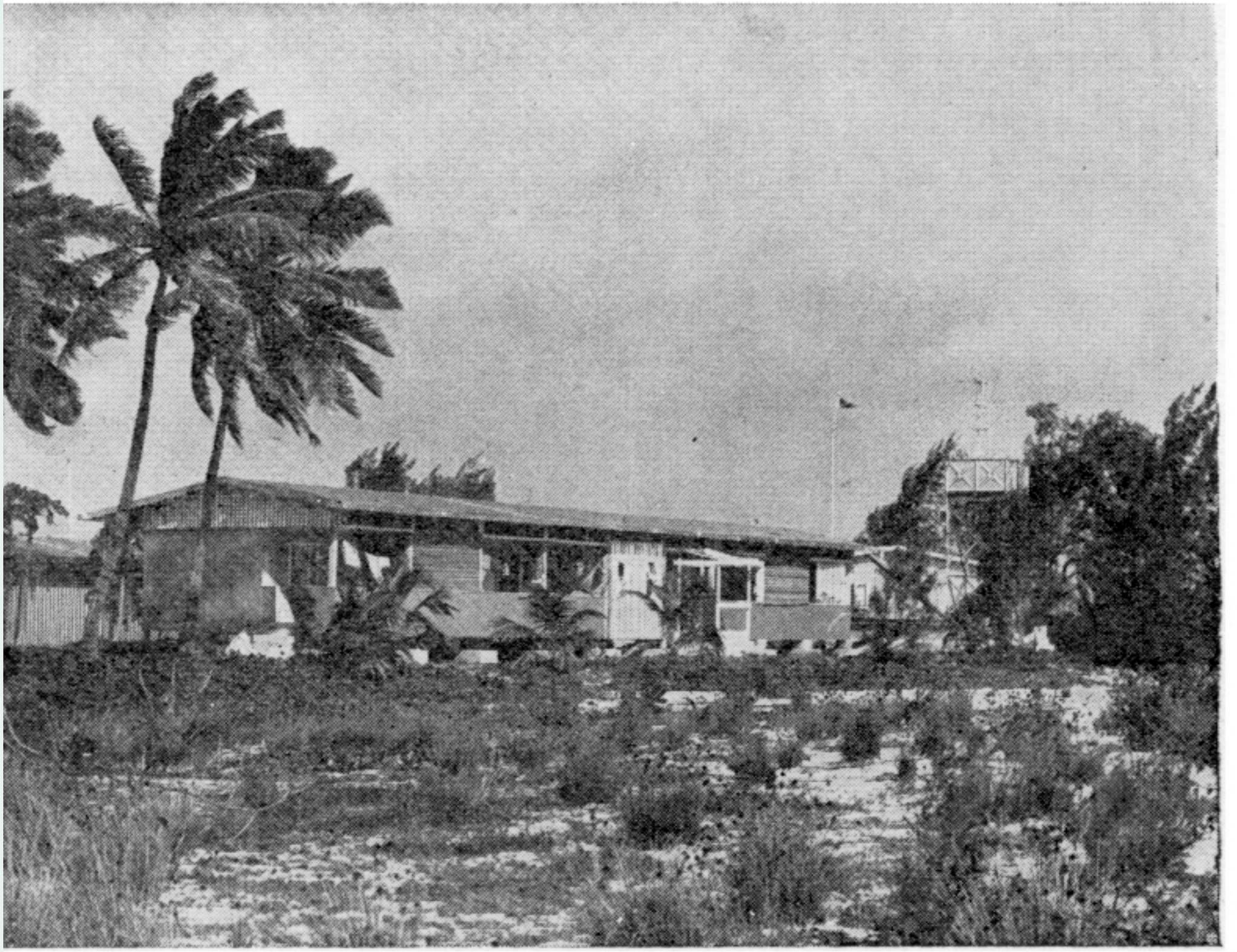

FIGURE 1. The Aldabra Research Station from the northwest.