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# NAMIB RESEARCH

*\*Photographs by the author unless otherwise indicated.*

*An International Effort*

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**G**OBABEB, South West Africa's internationally known Desert Research Station situated on the Kuiseb River in the Namib, is the *only* desert research station south of the Sahara. Scientific visitors from all over the world, many of them returning time and again, come to probe the secrets harboured by what is thought to be the oldest desert in the world. Since its establishment in 1963 under the guidance of the dedicated entomologist Dr. Charles Koch, more than three hundred scientists from fourteen countries and thirty-five universities and research institutions have enjoyed the facilities provided for research at Gobabeb.

First a small Hottentot village site, the earliest scientists to visit Gobabeb camped on the spot and either used the open well built by the Hottentots in the Kuiseb River sand or transported their own water. Finding the climate antagonistic to concerted scientific research under these primitive conditions, Dr. Koch envisioned a more permanent arrangement. In 1963 the first prefab laboratory and living quarters were erected. This building provided the interested scientists with a simple laboratory protected from the continual winds, hot sun and sometimes dripping fog to be found in the Namib. Certain aspects of desert living still posed problems (e.g., paradoxically, no fresh water available when the Kuiseb River was in flood) but the Station was immediately recognized as a worthwhile and extremely interesting locality to pursue all aspects of desert research.

In fact, during the first five years that Gobabeb was in existence (1960-1965), several dozen scientists from nine different countries of the world travelled to South West



Prof. Edmund C. Jager of Riverside, California examining one of the common Namib succulents. Prof. Jager has written numerous books about the flora of the deserts in the American Southwest and has recently visited South West Africa to compare the two types of desert vegetation. While in the Namib he found many adaptations in local plants similar to those known to occur in the American deserts as well.

*(Photo: Dr. L. Schulze)*

Africa especially to visit its little research station in the Namib, not to mention the numerous South African scientists who also visited there. Interestingly enough, some of the early support for the Station also came from overseas sources as a gesture of goodwill towards the continued success of this far-sighted venture.

One of these very early visitors to Gobabeb was Dr. E. J. Willoughby from Syracuse University in New York state. For a total of eighteen months he studied the birds of the Namib concentrating on the general biology but especially on the water economy of the desert adapted species. Some of his most interesting observations though relate to the special colouration of the birds in the Namib. He found that the universally accepted rules for bird colouration hold true also in the Namib. Namely, that many birds, particularly those which nest on the ground, tend to have plumage with colours and markings which frequently match the colour tones and patterns of the ground on which they live. This desert colouration serves remarkably to conceal the motionless bird from view when seen against its natural background. Since the

Prof. W. J. Hamilton III (kneeling) assisted by Dr. R. A. C. Jensen collecting black beetles in the Kuiseb River bed and simultaneously making temperature measurements.

Because of the cold foggy conditions, obtaining the *Onymacris rugatipennis* was too slow to run into the stickery grass which is its usual refuge.



human eye is so confused by the concealing colouration, it is assumed that this colouration also protects the birds from their natural predators—the hawks and falcons which also inhabit the Namib. Some especially graphic examples of this camouflage colouration were found by Dr. Willoughby to occur in the Namib.

Dr. Willoughby is now an assistant university professor in America but maintains his interest in desert research. His lectures often include examples of desert biology interestingly illustrated by South West birds that he observed in the Namib.

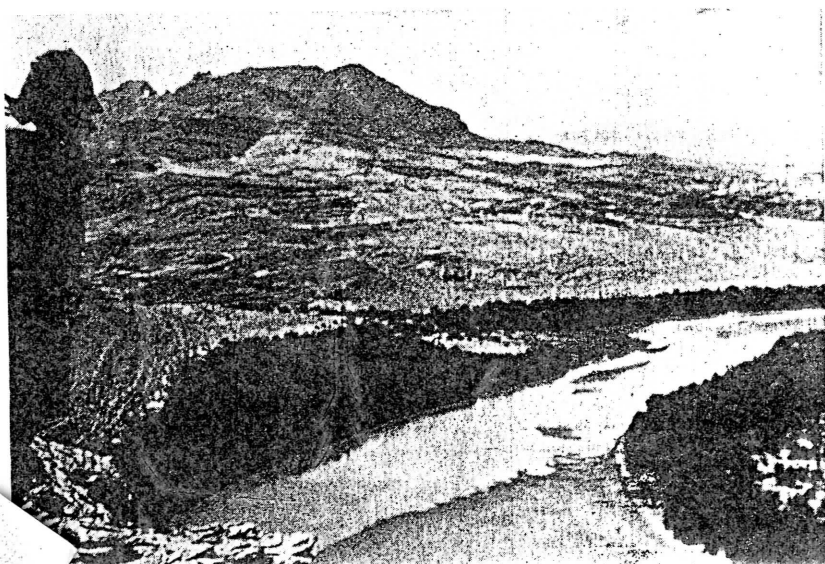
As Gobabeb grew—in 1966 the Desert Ecological Research Unit supported by the South African Council for Scientific and Industrial Research was established with Dr. Koch as its first director—so did the number of visiting scientists from Southern Africa as well as from overseas. Under Dr. Koch's inspired leadership attention of the world's desert scientists centred on the problems of the ultrapsammophilous ecosystem (i.e., life in vegetationless sand). No other sand dune system in the world has as much animal life as South West Africa's Namib!

In view of this unique situation obtaining in the Namib, Prof. W. J. Hamilton III from the University of California came to South West to spend fifteen months studying thermoregulation (temperature control) in Namib beetles. Namib beetles had been so well studied by Dr. Koch that further research was now profitable in more diverse fields. Prof. Hamilton's special interest was the

white tenebrionid beetle to be found on the Skeleton Coast and *no where else in the world!* Why are these beetles white? Since the white colour would reflect heat more than black, how does their thermoregulatory behaviour differ from that of the common black tok-tokkies of the Namib?

Prof. Hamilton's partial answer is that the more reflective colouration of the white beetles allows them to remain active on the sand surface longer than the black ones and that this altered behaviour provides them with foraging time not entirely competitive with their black relatives. Because of the many exciting questions left unanswered with respect to these very interesting exclusively Namib beetles, Prof. Hamilton plans to return to South West Africa to spend yet another year probing the secrets hidden in beetle colouration, black as well as white.

Well known to South Westers and now working in close collaboration with the Desert Ecological Research Unit of Gobabeb is the California geographer Prof. Richard F. Logan. During 1971 he spent six months working with the staff of the Namib Desert Research Station and the Department of Nature Conservation on a geographic and botanic survey of the southern Namib between the Kuiseb and Orange Rivers. From this work he intends to produce a scientific monograph describing the entire area as well as plans for possible touristic and economic development in the area.



The Orange River and Diamond Area I were both surveyed botanically and geographically by Prof. R. F. Logan of the University of California during his southern Namib research of 1971. Here the Orange River flows past the Jakkalsberge, an extremely interesting area botanically and geographically. Some of the succulents found here hadn't been collected since the early German botanists covered the area at the beginning of this century.



In yet another very interesting and important field — that of geomorphology (the appearance taken on by the earth's surface as a result of weather acting upon the original geological formations) — Gobabeb has enjoyed visits from five or six overseas scientists. The most extensive research in this subject was carried out by Miss Helga Besler. Miss Besler earned a doctorate at Stuttgart University with her study of central Namib geomorphology.

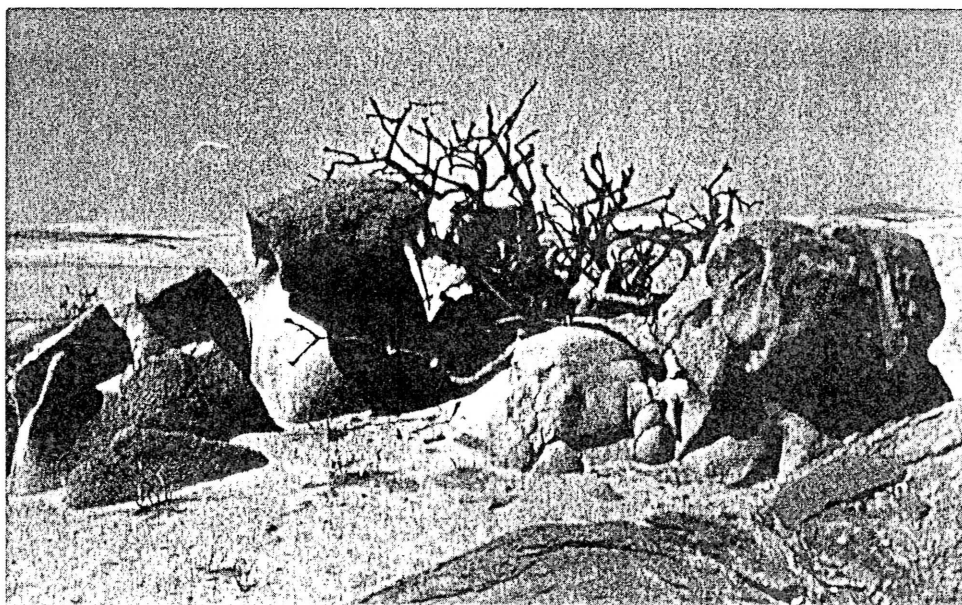
One observation of general interest made by Miss Besler concerned the location of the driest area of the Namib Desert Park. This she pin-pointed as existing directly west and north west of Swartbank Mountain near Rooibank. Her evidence consisted of the observation that gypsum soil polygons were best developed there. During her visit in late 1969 these polygons were clearly demarcated by grass which would grow only in the cracks between the polygons where the gypsum content of the soil was least.

Observations of the weather of the area also provided her with an explanation for this exact location being the driest of the central Namib. This area exists in a "fog shadow". That is, when the usual fog is blown in by the south west winds from the Benguela Current it is lifted up over the dunes south west of that area and is not so thick and moist on the ground. The actual lower level of extensive moisture is clearly marked on nearby Swartbank Mountain by the varying densities of lichen and other vegetation growth. Thus lack of rain and paucity of moist fog combine to cause the gypsum soil in this area to dry out more thoroughly than in any other part of the central Namib. And by locating the driest spot in the dry Namib she may have located one of the driest



Miss Helga Besler from Stuttgart, Germany examining a rock outcrop formation in the central Namib east of Hentiesbaai. She was especially interested in the weathered surface — the desert varnish — of these particular rocks.

A granite outcrop which Miss Besler found particularly interesting during her geomorphic survey of the central Namib. These rocks have been extensively sand blasted and attacked by salt and moisture until they assumed their present fantastic form.



spots in the world.

From the Netherlands came Dr. P. J. C. Nagtegaal also to study geomorphological aspects of the central Namib Desert. One of his most interesting correlations relates the similarity between the present Namib sands forming in beds on the coast south of Walvis Bay and those solidified beds known as Rotliegend Sandstones at the bottom of the present North Sea of Europe. Apparently both formations are the result of similar environmental factors. At one time the North Sea Basin experienced a desert climate and a similar geomorphic setting — wide,

Ganad wind pump — most likely deposited there by wind or birds.

Also extremely interesting to Miss Schmidt were the natural pools of water standing in the lower Kuiseb Canyon. Here numerous fascinating micro-organisms, many probably new species of different types, were collected. All her live material is preserved in formalin, and, before definitive observation can begin, a week is required to prepare the diatoms for the microscope. According to her rough estimate, at least a year will be necessary to describe and identify all her central Namib

Prof. H. Setzer (left) and Mr. D. Schlitter drying the skins of Namib gerbils for future museum preparation. These two American scientists are associated with the Smithsonian Institution and have travelled extensively in Africa conducting a small mammal survey of the entire continent. While in the Namib they discovered two or possibly three new species of gerbil and studied the ecological separations of those occurring in the vicinity of Gobabeb.



low-lying plains and ground water at shallow depths below the surface — to that obtaining on the coastal Namib near Walvis Bay today.

Although deserts are generally considered to be very dry places, what water they do have is exceptionally interesting as has been recently proved by Miss Anna-Marie Schmidt of Vienna. Miss Schmidt is an exchange University student studying diatoms for one year with the C.S.I.R. in Pretoria. After spending some time in southern Africa and hearing so much about South West and the Namib, she couldn't resist a visit there herself.

The diatoms which Miss Schmidt studies are micro-organisms with internal skeletons of silicate. Conveniently these skeletons remain intact even if the water in which they originally lived has long since dried up. Thus she was able to collect material from Sossus Vlei and Zebra Pan although both were very dry. Miss Schmidt also inspected many pools of salty and fresh water especially in the Namib Desert Park. Two minute but very interesting species were even found living in the water trough at

specimens, some of which will undoubtedly prove to be species new to science.

The research of the scientists described above constitutes just a small portion of the research carried on under the auspices of the Namib Desert Research Station at Gobabeb. While the majority of the work is carried out by scientists from South West and South Africa, an extremely important portion is performed by visiting researchers from overseas. Not described above but also of great import in the overall program of desert research are the groups of students, from South African universities as well as from overseas, who both research and learn from the fascinating biological riches of the unique Namib Desert of South West Africa.

South West Africa is fortunate to have such a desert research station in her fascinating Namib to attract the desert scientists of the world — scientists who then return home with a better understanding of South West Africa itself as well as desert biology.