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From the book *The Ra Expeditions* by Thor Heyerdahl

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SAYHAT: the town that became a family 2 BUILDING ON TRADITION-3 7



BY FRIEDRICH RAGETTE



BY MARY NORTON

A small oasis town in eastern Saudi Arabia has undergone a most unusual transformation-thanks to the inspiration of a most unusual man.





BY THOR HEYERDAHL



. I felt as if Neptune himself had taken hold of the oar blade out there in the blackness of the sea. Vast forces wrenched the oar from me and the whole vessel heeled, while white furies thundered out of the darkness and buried everything under my legs. The bridge vibrated and the crack of breaking wood was loud in my ears ..."

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Perhaps the most extensive blending of modern with traditional in Arab-world architecture has taken place in several of the small but booming states of the Gulf.

STONE OF EGYPT 14



BY JOHN LUTER



Charles Pomeroy Stone is a strangely neglected figure in Civil War history for a man who not only helped save Washington, but was also an Egyptian pasha.

ROAD SHOW 32

BY BRAINERD S. BATES



Aramco's Mobile Oil Exhibit toured some 50 towns and villages during the past ten years, carrying the story of Saudi Arabia's most important natural resource to the remotest inhabited areas of the kingdom. But now the "big top" has been struck for the last time.



Cover: Ra I, a seemingly frail papyrus-reed river craft similar to those in Egyptian tomb paintings, sets sail from Morocco to challenge the Atlantic Ocean-and test a noted archeologist's intriguing theory the hard way. Story on page 20.

The story of Abdullah al-Matrood: a "have" who remembers what it is like to be a "have-not."



5AYHAT: THE TOWN THAT **BECAME A FAMILY**

BY MARY NORTON

PHOTOGRAPHED BY ALI ABDULLAH AL-KHALIFA

n a world of contradictions, Ab- retiring yet he founded and runs two dulla Salman al-Matrood of Sayhat, contradiction in himself.

Abdulla has known bitter poverty. tion in the kingdom. Moving freely in high places, he is utterly a man of the people. At 45 years of age, old men call him father. His schooling was minimal yet university graduates look to him as their leader. He was taught no math but in his head he can multiply and divide double figures faster than most can Dhahran that soon enough duality

large and successful businesses and Saudi Arabia, is something of a in his spare time he presides over a society in Sayhat that is perhaps One of Sayhat's wealthiest men, the most effective charitable organiza-

If you live in Arabia you will be at least partially prepared for Sayhat, the mini-oasis town 16 miles north of Dhahran, headquarters of the Arabian American Oil Company. So steeped in contrasts between the timeless and the timely are, in fact, the environs of write them down. His nature is becomes the norm. You scarcely note a man once described as a "have" who

for instance, the camels in the shadow of Dammam's soaring TV tower, or the scruffy black sheep foraging at the gates of the electric power plant or the sun-bleached donkey cart that slows the sleek Mercedes.

You will not be entirely prepared though. For sprinkled throughout the town like sesame seeds, at the turnoffs to the Home for the Aged, The Happy Childhood Home, on the panels of two ambulances, a fire truck and the office on the main square is the legend Sayhat Society for Social Services. It is this signature that draws you up sharp, for the concept of organized social services is, in Saudi Arabia, rare. Nothing like it has gone before and nothing quite like it exists in or (one is tempted to say) out of the kingdom. Here, consummately, under the inspiration of Abdulla Salman al-Matrood, you find the timeless-the Islamic principle of zakat, the giving of alms—synthesized with the timely—social welfare projects which benefit the entire community, especially those in greatest need.

Every weekday morning, for example, driver Ali Jasim, boards a large blue bus, winds in and out of the town's dusty streets, collecting more than 250 pre-schoolers and conveying them to The Happy Childhood Home for a morning of classes, play and nutritional meals. At the same hour, across town in the Home for the Aged, Hilal Habib is preparing breakfast for a dozen or so elderly men who are stirring from deep dreams and squinting at the early sun which floods the large, airy, impeccably kept main room. And all over Sayhat, members of 176 families who receive monthly incomes from the society are greeting the day in the comfort of food enough, clothing enough, and if medical or other help is needed, somewhere to turn. Of these families even the most desperately poor no longer live in hovels but in pleasant concrete block homes.

These are a few of the services. provided by the Sayhat Society for Social Services, an organization founded, run and supported by the people of Sayhat under the direction of a dedicated coterie of young men led by Abdulla al-Matrood, the society's father, god-father and guru,

"have-not."

Abdulla al-Matrood was not always a "have." Although his father owned a pearl-diving boat which plied the waters between Sayhat and the nearby island of Bahrain, and for a long time life was comfortable, not only for the al-Matroods, but for all of the people engaged in the industry, poverty was not far off. In the late 30's the market for pearls declined, World War II broke out and many of reality. the men, including Abdulla's father, were left jobless. Abdulla remembers everyone being hungry, and there were times when he went two days without food, finally receiving for his ration a solitary date.

few of the men, including his half-brother Hasan, continued to search for pearls and on one occasion with Abdulla tagging along, found a pearl of unsurpassing beauty which, in spite of the moribund market fetched a fantastic price. Hasan's share meant that for the family the cruel days had ended. For the teen-aged Abdulla, however, they were just beginning.

For a time he dove for pearls but the job collapsed when his vision was seriously impaired by trachoma. The only work he could find was as a scrubber in a laundry located at the edge of the newly founded oil camp at Dhahran. In Dickensian fashion, he worked 16 to 20 hours a day, seven days a week with no holidays or vacations, for the sum of four rivals (\$1.33 at the time) a month, and after four years was raised to five rivals a month. At the end of five years, he took one day off to visit his family, telling his employer he would return the following day. His employer's response was to fire him.

For the next few years, living meant coping with obstacles. There was the "friend" who gave him a few feet of kitchen space to set up a laundry and demanded half the take each night, there were the attempts by his first employer, now a competitor, to have him shut down, and when Aramco problems raising money for materials however, Abdulla endured and pre- willingly with their share. vailed.

remembers what it is like to be a Laundry and also the National Dairy, shabby, hobble into the society's a firm supplying reconstituted milk, office and ease himself into a chair. ice cream and voghurt, Abdulla is Assuming he had come for his monthly benefit payment, the visitor indisputably a success. He could afford now the lost vacations of his was astonished to see the old gentleman dig deep into the folds of his youth, could frequent, if he chose, the world's favored playgrounds from thobe, extract three rivals and ceremoniously count them out for the Sardinia to Singapore. Apart from three pilgrimages to Mecca, however, Abdulla has taken no time off and has clerk. As the transaction was recorded, the old man beamed toothlessly and no plans to do so. He is too concerned at length, trundled off down the road. While it was clear that subscriptions with a dream, too busy making it a

of the townspeople must form the spine of the society, it was also Some years ago, out of deep distress over conditions of the poor of Sayhat, obvious that help from interested Abdulla, his brother Ebrahim and outsiders, individuals and businesses a group of kindred spirits conceived in particular, should not be overof an organization in which the sacred looked. Aramco, for example, which responded with a modest donation Islamic concept of responsibility towards family would be expanded so at first, found the society's first annual report such a model of clarity that the entire community could come to consider one another as family with and accomplishment that it has each year adjusted its donation upward to concomitant responsibilities. That was a basic: responsibility for one another. keep pace with the increased activities. The government, through the After drawing up bylaws and winning the approval of the Ministry of Ministry of Labor and Social Affairs, Labor and Social Affairs, the Sayhat has underlined its approval by sub-Charity Fund, later to become the sidies in excess of those given any other charity in the kingdom. Sayhat Society for Social Services, In time, the activities became incame into existence.

creasingly diverse. The cemetery A campaign was initiated to was cleaned, aid given to the firedistressed, not only of Sayhat but of surrounding villages, electricity was installed in the mosque and mortuary, asphalt ripple strips laid at a dangerous intersection (reducing to 0 the previ-ous record of 37 accidents in 5 years). A widower with six small children received a grant so that a marriage could be arranged. In the third year of its life, when receipts were relatively limited and the number of needy families considerable, the society discovered that one of its clients, Mohammad Ali Rabia, suffered from an advanced case of tuberculosis. Although it would impose a severe strain on the budget, the society decided to send Moham-The citizenry responded generousmad to a sanitarium in Lebanon. He spent seven months under care at a cost equal to a large share of the annual budget. When asked why so much had gone to aid one man when so many were in need, Abdulla replied simply, "If we had not sent him, he would have died." Today, Mohamcured. The case, it is said, profoundly

acquaint the townspeople with the objectives and to invite memberships in the form of annual subscriptions which would be paid monthly. Inquiries were conducted among poor families, many of whom were entirely without income. Case histories were taken and an individual plan established for each family in accordance with its needs and the resources of the society. During the first year, monthly incomes were provided for 28 families, one-time emergency payments for 30 families and medical aid for seven persons. Instructions on sanitary and health procedures were stressed as an aid in combatting disease, and efforts made to find work for the unemployed. ly, and each year but one has seen an increase in the number of duespaying members. To expect ordinary people to give month after month might seem a hazardous way to conceded him the laundry for its operate, especially as enforcement is Saudi employees, he had enormous out of the question. The society reports no difficulty in collections and supplies. Honed on adversity, however; people come promptly and mad is back in his village, completely ailed. Recently a visitor observed an impressed the people of Sayhat, who Today, as head of the National elderly man, his robes clean but saw for themselves the value the

society attached to a single life.

society found that certain elderly, disabled men, bereft of homes and families, had been reduced to beggary while others had families unable to cope with their special needs. Abdulla and his colleagues envisioned a place where these people could be gathered together and provided with proper food, care and gentle solicitude, where, above all, they could pass their final days in dignity. That vision is realized in the Home for the Aged, a tawny, double-winged building constructed on land donated by the Municipality of Sayhat and completed by the society in 1969.

Private rooms are reserved for those requiring isolation, otherwise the men rest in beds ranged against the walls of a long, cream-colored dormitory. They chat with one another now and then, but much of the time it is their pleasure to cuddle up and sleep. Many retain the kafiya, the turban-like headdress, and in their clean white thobes and linens they have about them a certain courtliness. One old gentleman—he must be 90—



sits ramrod straight in his robes, his crumpled hands folded together, brown eves twinkling as he surveys, one suspects, the terraces of his kingdom where milk and honey freely flow and fruits abound and everything is cool and fresh and green.

hrough mists of memory, they all know Abdulla and call him and **reach** out to him with both arms in the way that children do. "Abdullabdullabdulla," one chants, and "Ya, Shaikh, kif al-hal?" ("Venerable work is never finished." one, how are you?")

a former nurse's aide at Aramco's Dhahran Health Center. Seeing to the home replacement and repair, coun- and kiddie-cars, until the teachers needs and whims of the sick and senile, seling and other services. Life being signal them to assemble for the to their meals and baths and airings, fluid, however, families still apply or recitation from the Koran before putting up with what in their impair- are suggested, some in permanent, entering for classes.

Working among the poor, the hardly be considered cushy work, yet Hilal is more than equal to the task. He views the ancients as does Abdulla, as children, the children of God. In a recent annual report, the following note appears: "The society has the honor of catering for all the disabled people who have joined the home." For Hilal too, serving the helpless aged is an honor.

Board members are elected for three-year terms. Typical of the caliber of members is Vice-Chairman Ahmad al-Hilal, Preventive Medicine Advisor with Aramco, and a graduate of the American University of Beirut School of Public Health. As head of the committee for the Home for the Aged, Ahmad prepares the menus, frequently checks the patients, administers medications from the phar- munity family, to those who have no macy he has set up, and keeps complete medical files on the residents. Further responsibilities flow from his membership on the Status Inquiry Committee, which is charged with preparing case studies on the poor families. From time to time the board members hold open meetings



to acquaint the citizens with the aims and benefits and expanded programs of the society and to invite nonmembers to join. Finally, teams of board members visit the homes of those who may have missed the open meetings. All of this is clearly timeconsuming, but when it was suggested to one of the board members that having already done so much, he was entitled to a sabbatical, the reply was, "Never! The work is never finished.

In charge of the aged is Hilal Habib, care of now, through programs of

ments may be abusive behavior, can others in temporary need. Case studies are carried out promptly, but still it takes a little time, and hunger as Abdulla knows, does not wait. If he happens to be in the office when an applicant appears, he will dig into his pocket and press some rivals into the person's hand, just to tide him over. In vain does one search for the chink in the wall, for material detrimental to Abdulla. The closest one comes is the suggestion that in his zeal. his wife and 10 children see too little of him and his business falters. His colleagues agree that this may be so, but defend him on the grounds that Abdulla provides his family with comfort and security, and while he would like to spend more time with them, he feels he must first see to those other members of the comsecurity.

> Such is Abdulla's charisma that last vear when he was stricken with a rumored heart attack, people wept in the streets and filled the mosque with prayers for his recovery. By the hundreds they kept vigil outside the hospital several miles away in al-Khobar, as if hoping that from their numbers might flow strength enough to make him well.

> Not so long ago, small children, in the manner of slum children everywhere, wandered about the streets of Sayhat ill-fed, ill-clothed, ill-kept, tottering on the brink of disaster and disease, heedless of animals and automobiles, of stagnant pools and assorted debris. Today such children are a rarity; they are, most of them, joyously ensconced in The Happy Childhood Home, a combination daynursery and kindergarten, and the undoubted jewel in the crown of the society's activities.

Built partly with volunteer labor, on land given by Abdulla and his brother Ebrahim, the desert-yellow building opened in September 1970. With its portico of white columns and decorative bricks, it is long and low Abdulla moves to him, takes his hand. The projects are finished, but the and cool and designed to grow with the children. Here in the front yard, Most of the poor are being taken the small ones gather each morning except Friday, the Muslim sabbath, cash, food, clothing, medical aid, to romp and run and vie for swings

They have come on the bus, waiting like clusters of dates for who knows how long for it to lumber up, for



driver Ali Jasim to open the door and Ahmad Hamood to swing them aboard, waiting for the chance to crowd one another and frolic and holler and chant until the teacher shouts, not unkindly, "Bas! Bas!" "Enough! Enough!" Some come running, smocks half-buttoned, clutching flat circles of Arab bread to nibble on the way, and there is one little fellow who, in full view of the waiting bus, saunters slowly down the road, magnificently composed. The essence of a happy childhood is indeed taking things for granted.



All of the more than 250 children of the home is to be found not in the are of similar coloring and size, all present but in the future. Certain wear the same light-brown smock, yet children of the poor, lacking the by some unaccountable alchemy. Ali necessary accoutrements, have been Jasim knows if even one child has unable to accept the free government failed to materialize. Before the day schooling, the results of which are all is over a call will be made at the home too obvious. The home's children, having been set on the path to educaof the missing child to see if he is ill, to see if there is anything the society tion and with the society standing by to assist with any difficulties, are can do. Not all of the children are poor; virtually assured of schooling, and it is Abdulla's hope that when the first crop is ready for higher education, a program of society scholarships according to ability, from nothing will be waiting to speed them on their way.

many are from middle-class families and some are drawn from among the well-to-do. All are welcome and pay (more than half pay nothing) to 20 rivals a month, which covers only 15 percent of the cost per child. The society deemed it important that the school be open to all children, not only to avoid the ghetto syndrome but to provide an atmosphere where the poor could mix naturally and freely with the more advantaged, where by accepting and being accepted, the poor child might come to accept himself.

ertain steps were taken to assist in the process: the smart, completely new little wardrobes given the poor children, the daily showers for those in need, the nutritional meals. The soundness of the approach is evident in the fact that it is impossible to distinguish which children come from three-story villas and which from waterless, lightless palm-frond shanties. Every one of them is clean, welldressed, well-fed, bright-eved and bushy-tailed.

It is this, the individual improveand literacy classes for the ladies (to ment in each child that gives attractive, 28-year-old Jordanian headmistress be held at The Happy Childhood Hala Duzdar and her staff their Home) and an ambitious program of cooperative farming designed to prodeepest satisfactions. Wife of a UN vide jobs, money and food for the poor agricultural engineer stationed at the nearby town of Qatif, Hala arrived, and a profit for the society to pursue with a kind of divine felicity, just as its goals. The people of Savhat are proud of Abdulla was pondering the knotty problem of staffing the school. In their society, as well they should be. They are, after all, a family now, and Arabia women, as a rule, do not work their baby, born of compassion and outside the home, but permission was action, is thriving, with untold promgranted not only to hire her but two other Jordanian and five Saudi young ises to keep. ladies as well. In addition to administrative duties, Hala oversees the morning's activities, checking on Mary Norton, formerly associated with the Ford Foundation "Omnibus" television series, meals and classes, and meets frehas lived in Saudi Arabia since 1958. Mother quently with the teachers to discuss of three young children, she has contributed to problems and consider ideas for im-Aramco's TV productions and publications. proving the program. Perhaps the most touching aspect

One of the spin-offs of the Sayhat experience has been the flowering of other societies, on a smaller scale, in other villages. Presently there are seven such groups in the Eastern Province alone, but the bellwether continues to be the Sayhat Society. Abdulla Salman al-Matrood, with his boundless and buoyant faith in God and man, his uncanny gifts for sensing the moment when people are ready for a new idea, has several innovations in the works-public baths for women and children, evening homemaking







BUILDING ON TRADITION³

BY FRIEDRICH RAGETTE/PHOTOGRAPHED IN KUWAIT AND BAHRAIN BY BURNETT H. MOODY. IN DUBAI AND ABU DHABI BY ROBERT AZZI

> In the first part of this series (May-June, 1971) Professor Ragette chose the Dhahran Air Terminal and the College of Petroleum and Minerals, both in eastern Saudi Arabia, to exemplify how elements which had contributed to traditional Arab or Islamic architectural expression might just as logically be applied to modern buildings. The four main elements-climate, local materials and building techniques, living habits, and traditional forms-were also among the influences behind three modern buildings in Lebanon described in the second part of the series (July-August, 1971): the House of Lebanese Crafts, the Administrative Center for South Lebanon and the American Life Insurance Building. But perhaps the most extensive and

But perhaps the most extensive and dramatic blending of modern and traditional in the Arab world has taken place in several of the small states of the Gulf region, notably Kuwait, Bahrain, Dubai and Abu Dhabi, whose cities have undergone dynamic, almost boom-town expansions during the past decade, and examples of whose architecture the editors present in this concluding article.

1. The New Mosque – Abu Dhabi The New Mosque is "modern" only in the sense that this recently constructed building, the largest mosque in Abu Dhabi, exemplifies the timelessness of certain Arab and Islamic architectural forms. Although classic, the repeated arches, the dome, and the long horizontal profile with two minarets as striking verticle accent marks are elements which do not seem out of place in a modern context. The extensive and well-planned floodlighting further helps to bridge the gap between traditional and modern.

2. Abu Dhabi International Airport. The angular treatment of arches and protruding pointed vaults in reinforced concrete lends an exotic, yet starkly modern appearance to Abu Dhabi's air terminal building. The consultants and architects, Canadian Consulting Company, included a clock tower in a reflecting pool as well as a motel wing in their designs. The contractors, Skanska-Kettaneh, completed the \$8,000,000 structure in April 1970.

Kuwait Chamber of Commerce and Industry





This muscular structure was designed by Dar al-Handasah of Beirut as the result of an international competition. Three floors enclosed by arabesque façade units are sandwiched between heavy concrete slabs at top and bottom. This strongly defined volume projects over a recessed ground floor and is supported by an articulated system of beams and columns. The building contains offices and a 1000-seat auditorium.





Gulf Bank-Kuwait



Designed in 1963 by Tony Irving and Gordon Jones of the Design Construction Group, this neat two-story structure actually represents three separate buildings wrapped into one. It is remarkable that in this case the municipality of Kuwait insisted that the owners of the units adjoining the bank adopt the identical architectural treatment. The ground floor of the building is recessed, creating an external colonnade. The upper floor is fully shielded by precast concrete panels attached to projecting concrete brackets. The combined shapes of the units suggest crenellations on the top and stalactite decoration at the bottom; the hexagonal pattern of panels and voids is reminiscent of geometric Arab designs. The metallic sunscreens add a touch of seclusion. All these elements combine to give a strong local expression although the building is unmistakingly a modern one.

Secretariat Building of the Government of Bahrain



from the sea.

First National City Bank-Dubai

houses.





Dubai International Airport

Although Dubai has a population of something less than 100,000, state planners saw sound economic sense in building a grand and prestigious international airport. Architects Page and Broughton were asked to design a terminal aimed less at serving projected air-transport needs than at persuading international airlines to use the field as a major transit traffic center. The result, in any case, was a structure that provided ahead-of-its-time passenger facilities for today's jumbo jets, including restaurants and kitchens to serve 400, a free-zone shopping area, and even sleeping accommodations for stranded travelers. Plans also called for more than ample ground service and fueling facilities for the aircraft themselves.

To achieve an arabesque quality, the architects created a visually open and vaulted structure rather than relying on purely decorative motifs. The roof is composed of 56 lightweight, insulated "umbrella" units (each approximately 40 feet square) made of glass-reinforced plastic framed by steel, and supported on reinforced concrete columns. The umbrella units are similar to those of the Dhahran Air Terminal, completed just ten years earlier. The dome over the VIP lounge is also of reinforced plastic. A 110-foot concrete control tower compliments the curve of the vaulting and also punctuates the long horizontal line of the roof.

Automobile traffic approaches the second level of the three-level terminal on an elevated roadway and passengers reach the aircraft by means of spiral ramps at the end of three shaded fingers.

Costain Civil Engineering, Ltd., of London was awarded the \$10 million construction contract and the building was completed early in 1971.

Friedrich Ragette, Assistant Professor of Architecture at the American University of Beirut, is this year in Vienna. This article concludes his three-part series on modern architecture.



the Khedive Ismail set out a century ago to rebuild the Egyptian Army, which had won glory and renown in the reign of his grandfather Muhammad Ali, he turned for help to what must. at the time, have seemed an unlikely source. To direct the reorganization, training and expansion of his 18,000-man military force, he employed a foreign officer-but not, as might have been expected, an expert loaned by one of the European powers then competing for influence in the Middle East. The new chief of staff of the Egyptian Army in the year 1870 came instead from a young and distant nation still nursing the wounds of civil war. He was Charles Pomeroy Stone, formerly a brigadier general in the army of the United States.

Stone is a neglected figure in American military history, remembered mainly as the victim of a shameful injustice that forced him out of the Union Army in the midst of the Civil War. Yet his later achievements in Egypt, as well as his early record in the U.S. Army,

suggest that he was one of the remarkable military men of his time.

A trim, erect New Englander, with drooping moustache, Van Dyck beard and a thoroughly military manner, Stone was 45 years of age when he became the Khedive's chief of staff. He had been out of army service for more than five years and the stigma of past misfortune still clung to him, but as events were to prove, the Khedive could scarcely have chosen a more capable or loyal officer than this scholarly, sometimes stiffly formal career soldier whom he appointed lieutenant general and later a pasha. Stone served Egypt devotedly for more than a dozen years, and with the aid of some 50 other Americans who were to hold the rank of colonel or above in the Khedive's service, transformed the poorly trained, ill equipped Egyptian Army into a formidable military force which for a time-until financial difficulties developed and European powers intervened-spread the Khedive's influence deep into Central Africa.

Stone's early career was almost as

eventful as his years in Egypt. A member of a respected Massachusetts family, he had been graduated with honors in 1845 from the U.S. Military Academy at West Point, where he specialized in engineering and ordnance and ranked seventh in his class, and had served with distinction in the United States war with Mexico, twice being cited for gallantry.

In the years following the Mexican War, Stone as a young officer taught for a time at West Point and traveled in Europe to improve his knowledge of foreign cultures and languages. But he was too adventurous and wide ranging in his interests to be content with life in the peacetime army. In 1855, after serving at a number of military arsenals. he resigned his army commission as a major to live in California, where he became president of a bank in San Francisco. The bank failed, and Stone then embarked on an expedition to survey the sparsely settled Mexican state of Sonora. But he left California with his dignity and reputation intact. A senator from California said of him a few years later in a speech to the Federal Congress: "Never since the state was founded has a man gone into or gone out of it with higher consideration on the part of all those who knew him."

In December of 1860, Stone found himself in the nation's capital, preparing to report on his Sonora survey. The threat of civil war was growing, and the city of Washington was especially vulnerable to rebellion. Surrounded by areas sympathetic to the cause of the southern states, it had no military defenses, and its 60,000 inhabitants were divided in their loyalties. The Federal Government at the time had fewer than 15,000 regular troops and most of these were far away in Texas or fighting Indians elsewhere in the West.

y chance, in late December, Stone met his old commander from the Mexican War, General Winfield Scott, who though old and ailing, still held the U.S. Army's top command. Scott shared Stone's worries about the danger to Washington, and as a result, Stone in January, 1861 became the first man mustered into service for the defense of the capital. Appointed Inspector General of the District of Columbia, he was charged with organizing and instructing volunteers to

protect the seat of government.

In the months that followed, Stone performed heroic service. Washington soon became a city in turmoil. By March, high ranking military officers were resigning almost daily to join the rebel states, which had organized a Government of the Confederacy and were busy assembling an army and navy. The Federal Government under President James Buchanan, then in the final weeks of his term, remained complacent, assuming that the new administration would somehow maintain peace. Stone, however, recognized the peril and worked

- energetically to avert disaster. In preparation for the war he felt might
- break out at any moment, he rallied and drilled companies of volunteers, commandeered and stored supplies, drew up detailed plans for defense, and posted armed detachments each night at key public buildings and on the approaches to the city. By April 12, when the first shots in the Civil War were fired, he had nearly 3,500 well drilled volunteers ready to defend the capital-enough, he hoped, to hold off a rebel attack until troops from the northern states could come to their aid.

Meanwhile, in late February, he helped thwart a suspected plot against the life of the President-elect, Abraham Lincoln. Learning from detectives in Baltimore that rebel sympathizers planned to assassinate the incoming

Y ashington faced its greatest crisis in the first week after war began, and Stone again Stone's career advanced rapidly in the

President when he passed through that city enroute to the inauguration ceremonies in Washington, Stone promptly warned his superiors, with the result that Lincoln changed his travel plans and slipped into the capital by night in disguise. The following week, Stone on horseback rode alongside Lincoln's carriage in the inaugural parade, and supervised security arrangements, which included the posting of riflemen at strategic locations along the parade route and the concealment of 50 armed men beneath the platform on which the new president took the oath of office. rose to the occasion. Cut off from the northern states, the capital lay nakedly exposed to rebel forces whose campfires were visible along the heights on the Virginia side of the Potomac River, and apprehension mounted almost to panic. For seven days, until a regiment of Union troops broke through from the north, the responsibility for protecting the city rested almost entirely with Stone and his force of volunteers. During this critical week, he slept only three hours in his bed; the rest of the time he was in uniform, working feverishly to maintain morale and oversee the defenses.

next few months. In recognition of his ability and valor in the defense of



Washington, he was appointed colonel of one of the new regiments of the Union Army. In July, he commanded a brigade in the advance through the Shenandoah Valley, and soon after, commissioned a brigadier general, he was selected to command an army division, which was assigned to occupy the valley of the Potomac above Washington.

Then disaster struck. Ordered by a superior at headquarters to reconnoiter near Leesburg, Virginia, where the rebel forces were reported to be making ominous moves, Stone in October, 1861 sent a brigade across the Potomac to scale the muddy heights of Ball's Bluff and conduct the maneuver known to military men as a reconnaissance in force. The brigade was ambushed and butchered, with a loss of nearly a thousand men killed, wounded and captured. Among those killed was the commander of the detachment, Colonel Edward D. Baker, a powerful and popular Republican Senator who was one of President Lincoln's closest personal friends-the man for whom Lincoln had named his second son.

The battle of Ball's Bluff was a small engagement, and there was no real evidence that Stone, who was not present at the battle, had been responsible for the blunder. But the war had been going badly for the North, and the death of Colonel Baker came as a particular shock. Republican leaders in Congress

demanded a scapegoat for this latest disaster, and Stone was an inviting target. Not only was he a member of the opposition Democratic party, but in matters other than military, he had been tolerant and courteous in his dealings with slaveholders in areas of Maryland controlled by his troops. Only a short time before, in fact, he had issued orders that fugitive slaves who sought sanctuary within his lines should be returned to their owners. This was in keeping with the policies of President Lincoln, who was trying to keep the state of Maryland loyal to the Union. But it had enraged the radical anti-slavery Republicans in Congress and had led to an acrimonious exchange of letters between Stone-who bristled at what he regarded as political interference in his command-and the governor of his home state of Massachusetts.

o some impassioned politicians, Stone's apparent softness on the slavery issue together with his involvement in the debacle at Ball's Bluff, unimportant Department of the Gulf. suggested that he was a rebel sympathizer and probably guilty of treason, and the unfortunate general soon found himself caught in a web of suspicion. The two houses of Congress established a Joint Committee on the Conduct of the War, dominated by radical Republicans, and in secret proceedings, the committee gathered evidence against a subordinate commander in the siege Stone and judged him, without hearing his defense. Stone three times asked that a court of inquiry investigate his conduct, and General George McClellan, who had succeeded General Scott as commander of the Union forces, appealed in vain for a military court martial so that the brigadier might have opportunity to clear his name. Finally, at McClellan's urging, Stone was summoned before the Joint Committee and allowed to protest his innocence, but the committee members had already made their decision. In early February, while still in command of his troops, Stone was seized in his tent at midnight to please the politicians, he nevertheless their Emperor, and their practice of and carried off to imprisonment in Fort Lafayette, in the New York harbor.

Forbidden for a considerable time to communicate with anyone, Stone was never informed of the charges or told who had denounced him. Although the Articles of War provided that no officer could be held for more than eight days or

longer than it might take for a court martial to be assembled, he languished in prison for 189 days. Then, as abruptly as he had been arrested, he was released-without trial or explanation.

Free again, but with his career in ruins, Stone for months walked the streets of Washington-the city he had valiantly defended the year beforeseeking vindication and an opportunity to return to combat. But no one in authority would listen. General Joseph Hooker, then commander of the Army of the Potomac, asked for Stone as his chief of staff, but the War Department refused, and the discredited brigadier remained unemployed until General Ulysses S. Grant, his friend and fellow officer in Mexican War days, emerged as the Union's top commander, with enough prestige to override the politicians. Then, nine months after his release from prison, Stone was assigned to Louisiana, under General Nathaniel Banks, in the relatively

Stone served under Banks for nearly a year, first as a brigade commander and then as chief of staff. But he still had powerful political enemies, and Banks proved unsuccessful as a military tactician. As a result, Stone again was relieved of command. He was returned to combat in the late summer of 1864, as of the strategic Confederate base at Petersburg, Virginia, but after only a few weeks the strain of the suspicions against him became more than he could bear. Kept under surveillance most of the time, he abruptly resigned his commission and guit the army in mid-September-seven months before the end of the war.

Despite the misfortunes that had forced him from the Union Army. however, Stone still had loyal friends in the American military establishment. Too strict and formal to win wide popularity among his troops, and too outspoken was highly regarded by many of the professional military men with whom he had served-among them General Grant, who as the military hero of the Union victory, was elected President in 1868.

When the Khedive Ismail began casting about in 1869 for foreign experts

to train his army, Stone, by coincidence. was looking for new employment, after four years as superintendent of a Virginia mining company which had gone bankrupt. He was eager for the opportunity to prove himself in a new military career, and his friends had no hesitation in recommending him to the Khedive.



For Ismail, a shrewd, intuitive man of 39 who then was in his fourth year as Viceroy of Egypt, the employment of an American as his chief of staff offered obvious advantages. Not only had American military expertise recently been pushed to new heights by four years of civil war, but more important, the Khedive wanted a man whose loyalty he could command. In his first years on the throne, he had entrusted the training of his troops to French officers loaned by the Emperor Napoleon III. But the members of this French military mission owed primary allegiance to looking for guidance to the French consul-general in Cairo had so weakened their influence that all but one had returned home. An American, the Khedive must have reasoned, would be free from obligations to any European power and would present no such problem.

Invited to Cairo in the winter of

1869-70, Stone was soon joined in the Khedive's service by other former officers from the United States, ranging in rank from generals to captains and drawn from opposing sides in the American civil war, All, including Stone, were commissioned as officers in the Egyptian Army, which gave them authority to command as well as to instruct, and placed them on a different footing from European officers in Egypt's military service. In return, the Americans took an oath of loyalty to the Khedive, swearing to fight against any who might become his enemies, with a single exception: they could not be required to make war against the United States.

The army these Americans had undertaken to help train was, in 1870, only a tattered remnant of the great Egyptian Army that had inflicted resounding defeats on the Turks only a few decades before. In the 1830's during Muhammad Ali's reign as Vicerov of Egypt, troops led by his son Ibrahim, father of the Khedive Ismail, had swept northward beyond the farthest point reached even by the army of the famous 17th dynasty, which had conquered Tyre and Sidon 1,450 years before the birth of Christ. They had crossed the Taurus range and defeated the last army the Sultan of Turkey could raise against them, and on two occasions, only interposition by a coalition of European powers-England, Russia, Prussia and Austria-had prevented the Egyptian Army from taking Constantinople.

n 1841, however, Muhammad Ali and his army of 146,000 men had Leen made to yield by the forces and intrigues of the European powers who allied themselves with the Turks to curb his ambitions. Under the terms of peace, Egypt retained its guasi-independence, but Muhammad Ali as its Viceroy remained subject to the Turkish Sultan, required to send one-fourth of Egypt's gross revenues to the Sublime Porte. It was further stipulated that the Egyptian Army in the future would be limited to 18,000 men, unless Turkey should need its aid in war.

This small army had been maintained as a proud and efficient force until 1848. But it had greatly deteriorated during the reigns of the Khedive Ismail's two immediate predecessors, Abbas Pasha and Sa'id Pasha.

The conditions Stone found on its relations to the army. He promptly received authority to organize a staff and becoming chief of staff in 1870 were select officers for it, and also to create described years later in a paper which he prepared and read to a meeting of the a staff college for the training of young Military Institution of the United States. officers. These were set up along American lines, with the staff college Egypt then had few of the raw materials it would need in case of war; its coastal following the model of West Point as closely as local customs would permit. defenses were antiquated and woefully By late summer of 1870, existing inadequate; it was entirely dependent on foreign countries for small arms schools for the training of artillery, infantry and cavalry officers had also ammunition; the army had no signal service, and guns of the field artillery, been enlarged and improved, and the Khedive, at Stone's urging, had issued besides being insufficient in number, were an order forbidding the promotion all muzzle-loaders of bad and various of anyone in the army, even to the lowest models. There was no staff, nor any organization into divisions or brigades, non-commissioned rank, unless he and instruction in drill and quard duty was could read and write. conducted according to the ideas of **T** ith education thus made respectable again, Stone said each regiment's commander, who in his account, the whole communicated directly with and received army became a school for an hour and orders from the Minister of War. The a half each day, the prestige of educated value of education, moreover, had been downgraded. More than a third of the officers grew, and by 1873 fully 75 percent of the army's rank and file could officers could neither read nor write, and not only read and write but also had in the rank and file, perhaps no more some knowledge of arithmetic and the than one man in 10 could read or write geography of Africa. A special school his name. As a first step, at the Khedive's was set up in 1873 to train noncommissioned officers, with the result that drill became uniform throughout the

request, Stone prepared a report explaining the need for a military staff and



army. And this was followed, again at Stone's suggestion, by the creation in each division of the army of a school for soldiers' sons, who, the Khedive decreed, were to have the right to be educated at public expense between the ages of 8 and 16.

Other changes also were underway, and by 1876, the transformation of Egypt's military establishment was almost complete. Coastal forts had been modernized; the army had been extensively equipped with new and modern weapons, including 600 Krupp breech-loading cannon; and Egypt had set up a complete foundry for the casting of shot, as well as a factory capable of turning out 60,000 metallic cartridges per day. Storehouses were well stocked with ammunition and supplies, including mechanical and electrical torpedos, and orders had been placed abroad for a modern powder mill and a complete arsenal for the manufacture of muskets, carbines and pistols. Signal duty was being carried out efficiently in all batallions of the army, and new training facilities included a torpedo school and a target range that could accommodate all the arms of service and all classes of cannon.

In 1870 Stone had found in the Egyptian War Department only three maps, and no books except for a few copies of a volume on infantry tactics. By contrast, the army's general staff in 1876 possessed thousands of maps and a well-selected library of 6,000 books and manuscripts on military topics, and operated a printing office which was issuing new maps, reports of

reconnaissances and surveys, and a monthly military magazine. The general staff also had been given jurisdiction over the Department of Public Works, formerly an independent ministry, and thus had taken over supervision of Egypt's extensive canal system, and the major harbor improvements that were underway in Alexandria and Suez. As a result, young Egyptian officers trained in the new staff college were beginning to replace British and French engineers as supervisors of canal and railway construction.

The most spectacular change, however, was in the size of Egypt's army. The Khedive in 1873 had obtained a lifting of the restrictions that limited it to 18,000 men. and major expansion began almost immediately, following a table of organization drawn up by Stone. By 1876, the Khedive had 60,000 welldrilled troops at his command in Egypt proper, and a separate army of another 30,000 on duty as an occupation force in the Sudan. In addition, Stone estimated that 60,000 reserves could be mobilized at any time from among the village guards, who were exempt from peacetime military service but were accustomed to obeying orders and using arms.

As Egypt's military strength grew, the Khedive gradually extended his domains. His troops pushed farther and farther into the Sudan, conquered the empire of Darfour in 1874, and after a sharp but short campaign, occupied the Kingdom of Harrar in 1875, thus bringing under the Khedive's rule, in Stone's words, "nearly all the African territory



anciently ruled by the pharaohs of the most brilliant dynasties." In 1874 one of the American officers pushed through to Lake Victoria, and in 1876, a steam vessel bearing the Khedive's flag plied regularly on Lake Albert to supply the military posts which guarded the land of Unvoro. At that time, according to Stone's detailed account in later years, "the Khedive's flag was maintained over military posts in his quiet possession from Damietta to near Urundogani, a stretch of 31 degrees latitude, while his staff officers, trained in the new college and led generally by his American officers, carefully explored and mapped vast regions until then practically unknown to European geographers."

The Khedive's free-spending ways, however, were rapidly bringing Egypt to the brink of bankruptcy, and this gave the British and French an excuse to intervene. In the summer of 1878 Ismail, under financial and political pressures that he could not easily resist, took into his cabinet two European ministers; a British Minister of Finance and a French Minister of Public Works. At the time, Egyptian troops who had been sent to the aid of the Ottoman Sultan in the Russian-Turkish war were returning home, and were due a year or necessary, and the two new ministers used the occasion to the political advantage of their governments. One of the first economies made was the discharge of all the American officers except Stone, whom the Khedive insisted on retaining. This was followed by abolition of the staff college and the schools for soldiers' sons, and the disbanding of most regiments of the army.

In an even greater blow to army morale, the government—while continuing to pay civil servants regularly and even increasing the salaries of the European ministers—placed army officers on half pay, ignored military pensions, and failed to pay most of the arrears to which soldiers were entitled. This injustice, though endured for months by the well-disciplined troops, led the following spring to unrest and a cabinet crisis, which brought British and French gunboats to Alexandria and resulted in increased power for the European ministers. Soon after, in June 1879, Britain and France, with the acquiesence of Germany, Austria and Italy, forced Ismail from the throne and replaced him with his son Muhammad Tewfik who, while Khedive in name, was subject to the orders of British and French controllers.

S tone stayed on to assist the young Khedive, serving him as loyally as he had Ismail. When Arabi and much of the Egyptian Army rose in revolt in 1882 against the arbitrary rule of the two foreign controllers, the American pasha and many of the ablest Egyptian officers—men he had helped train remained faithful to the Khedive and his government. Stone did so with mixed emotions, realizing that victory for the young Khedive would also mean victory

trustrally star balance in filtentiliste

for the British, who sent an army to restore him to power. But his code of loyalty allowed him no other choice; he was among the first to take action against the revolt and, on more than one occasion, risked his life in defense of the sovereign.

Stone's fears were quickly realized. The first act of the British after defeating Arabi's forces was to require that the Khedive, before returning to the capital, issue a decree disbanding the entire Egyptian Army, including his personal guard and others who had defended him valiantly in times of peril. In its place the British organized a new force of 6,000 men, commanded and staffed by British officers. For the time, Egypt's independence was ended.

Stone's own eventful career was marked by a final touch of irony. Following his return to the United States in 1883, he was employed as chief engineer in charge of constructing the pedestal for the Statue of Liberty, which was to stand in the New York harbor, only a short distance from the fortress in which he had once been unlawfully imprisoned.

e completed this assignment, then died of pneumonia in New York in 1887, almost penniless and destined to be almost forgotten by later generations of his countrymen. Some two years before his death, however, he read into the record of the Military Institution of the United States a glowing tribute to the courage and ability of the Egyptian military men he had come to know and respect during his years as Egypt's



chief of staff. Reflecting both sadness and deep affection, the paper reviewed the long history of military affairs in Egypt, and concluded with these words:

"Let us hope that the Egyptian Army, whose fortunes we have today followed through thousands of years, which we have considered in glorious successes and sad defeats, which has sometimes disappeared for generations and sometimes for centuries, and yet again reappeared and existed gloriously, may again, and that soon, within the time even of some of the elders among us, reappear in renewed glory, to assure greatness and happiness in the beautiful land of the pharaohs."

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Years ago, Norwegian archaeologist Thor Heyerdahl began to wonder why it was that when 15th- and 16th-century Spanish explorers "discovered" Central and South America, they found astonishingly advanced civilizations—Aztec, Mayan, Incan—along with traditions that white men resembling the Spaniards had come to their land centuries before.

Particularly intriguing was the indisputable similarity of reed boats painted on tombs in Egypt to reed

boats painted on ceramic pots in Peru—and to boats still used to this day on Easter Island on the Pacific side of South America as well as others on Lake Titicaca in the high Andes. Was it likely that boats so nearly identical had developed independently of each other? Some archaeologists said yes, but Heyerdahl thought it was much more probable that the boats, as well as nearly 60 other features similar to both ancient Egypt and ancient Peru, had been imported.

This would imply, however, that Egyptians—or someone from the Mediterranean—sailed across the formidable South Atlantic in apparently fragile, unseaworthy boats made of the reeds that once grew in profusion along the Nile. Was this possible? Heyerdahl, who had already floated across the Pacific on the now-famous balsa raft, *Kon-Tiki*, to prove an earlier theory, decided there was only one way to find out: build a papyrus boat and sail it to South America. After two tries, he did it, proving, as he said in an interview with *Aramco World* during a visit to Lebanon last year, that someone *could have* done it, if not that they *did* do it, or who "they" were.

"We always suspect that it was the Egyptians," he said. "But I'm not convinced. I built my boat in Egypt because Egypt is the country where we have the papyrus boat represented in detail on the tombs. (But) ... there is nothing to have prevented ... an expedition of mixed background— Egyptian-Phoenician, for example."

That reference to Phoenicians, and a subsequent hint that perhaps the original Mediterranean visitors to South America might have set sail from the ancient port of Byblos, stimulated speculation that Dr. Heyerdahl might be planning to build a Phoenician trireme in which to trace Phoenician trade routes. But all Mr. Heyerdahl would say in Beirut was that he wanted "to get acquainted with the archaeology of ancient Phoenicia." Maybe. But to followers of a man who crossed the South Atlantic twice, once as related in the following excerpts from *The Ra Expeditions*, it is more interesting to think that one day a rebuilt Phoenician trading ship might weigh anchor in Lebanon and set sail for—where?

-The Editors

Text and photographs from the book, The Ra Expeditions, by Thor Heyerdahl. Copyright © 1971, George Allen and Unwin Ltd. Published in London at £ 3.50.



he Canary Islands were behind us. In eight days we had sailed the same distance as across the North Sea from Norway to England, A vessel which does not lose its battle with the seas on such a long voyage is usually regarded as a "sea-going" craft. Despite broken rudder-oars and yard, despite the maltreatment of inexperienced, non-Egyptian landlubbers, and despite storm and waves, Ra was as buoyant as ever. The whole cargo ocean. We sailed on in high seas serene waters of the Nile ...

heard that there were islands out with the spare mast should break, for living on them. He wanted to know worst encounters with the sea. On if they were black like himself, or the other hand, we did risk setting on the Canary Islands and was also wind was from the north and bitterly an anthropologist, told us about the cold, although we could still glimpse Europeans "discovered" them, some we re-stowed the cargo on the port, generations before they sailed further or lee side, which was as high above and "discovered" America ...

on the Canary Islands, was not so much who they were as how they got there. When the Europeans found them ... they owned no boats of any sort, not even log rafts or canoes. And there were large trees growing on the Canary Islands, so they were not short miles, or more than a thousand kiloof timber. Both the dark and the fair meters as the crow flies, and we had guanches were typical farmers, who bred sheep. They had managed to bring live sheep with them from constantly appearing round us. Once Africa to the islands. To leave the we could see three big ocean-travelers African coast with women and live at the same time. We must be on the sheep on board, vou must also be either a sailor or a fisherman, at all brightest of our paraffin lamps had events not just a herdsman. Why had to be hung at the masthead to avoid the guanches then forgotten the boats of their seafaring forefathers? Could was empty of human voyagers and it be because their forefathers knew only schools of dolphins danced about no boats other than the sail-carrying reed boats, madia, which have survived on the north coast of Morocco moonfish drifted past, and the first to the present day? A boat-builder flying fish began to shoot up under who only knew how to build reed our bows. The sky was empty of ships and had never learned the living things. Only the occasional lost living at a time when the earth was

principle of joining flat planks together insect blew aboard and a pair of small to form a hollow, watertight hull, would be left helpless and shipless on the beach when his own reed boat island where he had landed ...

problems, while we repaired the other and we only hoped that the sea water rudder-oar with patched-up bits of two different broken shafts. No spikes or nails were used. All the joints were made of rope, otherwise the wood the camels trying to eat the side of our would have splintered at once. The powerful running seas continued, drenching the windward side of Ra so that the papyrus rolls became still whale nor fish had tried to feed off still lay safely out of reach of the wetter, right up to the railing, and our floating sheaf, but we were not weighed the exposed beam deeper which had little in common with the and deeper into the water. As long as the seas were running so high we were Abdullah, who knew no islands not going to risk putting out the other other than the flat ones floating on repaired rudder-oar, but we kept it Lake Chad, was alarmed when he ready in case the one strengthened here in the fierce seas, with men now and then it bent ominously in its white like us. Santiago, who had lived the full sail, and that went well. The mysterious guanches who were living the low sky ceiling along the coast of on these distant islands when the the Spanish Sahara. As far as possible the water as when we set out. Under The real mystery of the guanches full sail our heavy, broad reed bundle on which we were floating. With the picked up speed again and moved westward at a steady rate of about 60 nautical miles in 24 hours, or 2.5 knots, and we could clearly see our own wake behind us. After 11 days' sailing we had covered 557 sea to put our watches back an hour.

For two days, ships had been great circle route round Africa. The collisions at night. But soon the sea us, some so near that we could have patted them. One or two lethargic

petrels flew in rapid darts between the wave-troughs. This little seabird sleeps on the water, because it floats decayed with age if no papyrus or over the highest seas as lightly as other floating reeds grew on the papyrus. In the last few days masses of small brown beetles had begun to For three days we sailed with no creep out of holes in the papyrus would kill off eggs and larvae so that we would not be eaten away from within. The skeptics who had seen boat had prophesied that the reed might well be fodder for hungry marine creatures. Up to now neither at all happy about these emerging swarms of little beetles.

> un and moon rolled westward in turn to show us the way. The lonely night watches gave us in full measure that timeless perception of eternity that I had experienced on Kon-Tiki. Stars and night-black water. The immutable constellations sparkled above us, and just as brightly beneath us the shining phosphorescence glittered: the living plankton glowed like sparks of neon on the soft dark carpet sparkling plankton beneath us we often seemed to be riding under the night sky on a billowing mirror, or perhaps the sea was crystal-clear and bottomless, so that we could see right through it to myriads of stars on the other side of the universe. The only thing that was firm and near in these omnipresent stellar heavens was the supple bundle of golden reeds on which we rode, and the big, square sail which stood like a shadow against the stars, broader above, by the yard arm, than across the bottom, near the deck. This ancient Egyptian outline of the trapeze-shaped mainsail in the night was enough in itself to turn the calendar back thousands of years. Silhouettes of sails like these are not seen against the sky of today. Strange squeaks and snorts from papyrus, bamboo, wood and rope did the rest. We were not living in the age of the atom bomb and the rocket. We were

still large and flat and full of unknown seas and continents, when time was the common prerogative and no one was short of it ...

Westward progress of over one hundred kilometers (or nearly sixty nautical miles) could be plotted on the chart every day, even though the horizon never changed. The border line between sea and sky was the same every day and at all times of day. The horizon moved with us and we were always its focal point. But the masses of water also moved invisibly with us. The Canary current was a fastmoving, salt-water river flowing towards the setting sun, keeping eternal company with the trade wind, westward, air and water and all that floats and blows. Westward with sun and moon ...

We gradually began to learn interesting lessons from our testing the papyrus boat. The slanted rudderoars had been the first to disclose their secrets, showing themselves to be a missing link in the evolution of man's earliest steering mechanism from oar to rudder. Next the wash-through bundle-body of the raft-ship itself began to reveal its true qualities. In addition to an almost unbelievable loading capacity, the papyrus reeds possessed both a toughness in rough seas and an enduring buoyancy which quite contradicted the preconceived verdict of modern man. Yet it was the rigging that revealed the most significant secrets about this ancient vessel's forgotten history, showing that it had been originally developed as something more than a mere river craft. In the design we followed, Landstrom had copied all the details of mast and rigging from the ancient Egyptian wall paintings. A strong rope ran from the masthead to the bow of the boat. But no corresponding rope ran from masthead to stern, although one rope forward and one aft would have been the logical requirement to hold the straddled mast erect on a river boat in calm waters. The ancient Egyptian ships' architects, however, carefully and strikingly avoided any rope running from the masthead all the way aft. Instead they secured five or six ropes at different heights on each of the two straddled masts and these ropes were stretched diagonally down in parallel lines to either side of the

way the whole sternmost part of the conviction that this curl was simply boat was free of mast stays and could intended to beautify the shape of a rise and fall on the waves with no river boat. Yet as the days passed we attachment to the mast. No sooner ourselves were as unable as the had Ra begun to pitch on high seas Egyptologists to detect any practical than we realized how extraordinarily function for it whatever. We did important this special system was. constantly make sure, however, that The stern hung behind the rest of the the curl was not beginning to straightboat like a trailer which must be en out. It remained in perfect shape, allowed to ride up and down freely so our friends from Chad seemed to over all the bumps. Had it also been have been right in thinking that they secured by a stay to the masthead the had done their work so thoroughly mast would have broken as the first that it would keep its curve without big ocean rollers surged beneath us. having to be fastened to the deck by rope. The only mistake we could see In our dance over the high wavecrests the middle section of Ra was we had made so far was in stowing rhythmically thrust upwards while the the cargo as for an ordinary sailing full weight of bow and stern sagged boat in those first days. No living man, simultaneously in the wave-troughs on only our own costly experience after either side. Had both ends of the hull long sailing in the trade-wind belt, been attached to the mast, it would could have taught us that a papyrus have broken under the pressure. As boat should have its heaviest cargo things were, the mast was well able to concentrated on the lee side. Now we support the curved prow while holding were already so waterlogged on the the central part of the soft deck windward side that the starboard suspended in a straight line. Everygunwale was inexorably approaching thing which lay farther aft was allowed the water level ... to follow the motion of the sea.

We all daily praised this ingenious arrangement and special function of the rigging. Norman, the naval expert, in particular, saw at once what it meant. There was no mistake about it. The creators of the old Egyptian rigging had prepared their flexible reed boats for the meeting with ocean swells. After the third day at sea I was already writing in my diary: "This rigging is the result of long experience in navigation on the open sea; it was not born on the calm Nile."



But there was another detail of the special Egyptian ship design which we took longer to understand; and for that, we were to pay dearly. Every day we looked admiringly at the broad, in-turned curl on the high-peaked stern. What purpose did it serve? We vessel a little aft of midships. In this placed no reliance on the general



n June 4th the rough seas about us began to calm down, and next morning we awoke to a new world. It had turned nice and hot, and the sea was a procession of long, shining rollers. We received another quick visit from five big whales: a majestic assembly. Perhaps they were the same ones which had called on us before. They were beautiful and friendly in their own element and we thought with horror of the day when mankind would have succeeded in launching its harpoons into the last of the sea's warm-blooded giants, so that in the end only the cold steel hulls of submarines would be frolicking in the ocean depths where the Almighty -and most men-would rather have seen the whale suckling its young.

It was so nice and hot that Georges tore off his clothes and dived overboard with his lifeline on. He disappeared under the Ra in his diving mask and came up again with a shout of delight which made Yuri and Santiago dive after him, each on his lifeline, while the rest of us watched and waited our turn ...

The exhilarating salt-water bath

made everyone feel new-born again. And to see *Ra* from below was among the greatest of all thrills. We felt like little pilot fish swimming under the curving belly of a gigantic yellow whale. The sunbeams were reflected like search lights from the depths and played up against the papyrus bundles over our heads. Sea and cloudless sky together created the bluest blue round the big, shining yellow whale which glowed above us ...

ere and there on the underside of the papyrus hull, small, longnecked barnacles were beginning to grow, waving from their blue-black shells with orange gills like soft ostrich feathers. But there was no sign of verdancy or seaweed to be seen the crate containing the life raft. anywhere. The papyrus reeds, which in the Sahara sand had been greyishvellow, shrunken and dry, had swollen under the water into smooth, shining stalks of gold and when we pressed them they were no longer brittle and fragile as before, but hard and resilient as motor tires. Not a single reed had worked loose or broken. The papyrus_ masthead and were secured to either had now been in the water for three weeks. Instead of dissolving by decomposition after two weeks it had become stronger than ever, and there was no sign of the reeds losing buoyancy. The list to windward was due to water absorption above the ship's water-line, amounting, in effect, to added cargo ...

Next morning the weather was still wonderful and I clambered over the It was the freely trailing section of iars aft for a morning bath. There sat the morning watch, Yuri, happily enjoying himself washing his underclothes, but on board, without the was still as it should be. The prow was canvas bucket. Every roller sent a little ripple over the papyrus gunwale still stretched her neck; only her tail at our lowest point, where the steer- was beginning to droop. If the mast rhythmic trickle was just enough to of a stay to hold up the stern as well, keep a little pool at the deepest point this would not have happened. But aft.

more practical," observed Yuri happily. "Now we have a washstand with The stern must be allowed to unrunning water."

rudder-oar [which we had repaired] so We tried to pull it up with ropes that the waves would support most of stretched diagonally to either side of afterdeck was not built for beauty.

continued to let in the ripples and as long as it simply provided us with a wash basin this was generally popular. signs of straightening out. For safety's sake Georges swam underneath Ra and discovered for the first time that the bottom was beginning to sag just papyrus bundles were just as whole and strong and when he squeezed the reeds air bubbled out. The reed was just as buoyant as before. We must simply have been carrying too much weight aft.

Now we moved all the cargo from the afterdeck so that the only weight left behind the cabin was the heavy crossbeam on which the two steering oars rested and the steering bridge itself, which stood on poles and sheltered

over the starboard quarter. We made another thorough inspection both above and below water. It was obvious that Ra had preserved her original shape perfectly, from the bows back to the exact point where the backmost pair of stays ran down from the side of the boat. Aft of this point there was a visible kink where the whole after part of Ra began to tilt gently downwards.



WW W e began to ponder again. the boat which had taken a downward turn, while everything which was attached to the stays held up by the mast as high as ever. Our proud golden swan if we tried to hoist the stern up with "This yacht is getting more and such a rope, the mast would break when the first roller passed under us. We hastened to launch the heavy sag at a permanent angle in this way.

its weight, but our lowest corner the cabin. We tried to fasten thick stretchers from the stern, over the guard-rail on the bridge and on across the cabin roof to poles erected on the We checked the curl on the stern. It foredeck. This was the Egyptian was just as before and showed no method of lending rigidity to wooden ships, but there were no such horizontal hawsers shown on paintings of papyrus boats. And however much we strained and hauled on all these aft of the basket cabin. But the ropes we did not succeed in heaving the afterdeck up again ...

he days passed. More water washed in over the stern every day. While its lower section slowly gave way beneath it, the fine curl at the upper end of the stern arched as elegantly inwards as ever, showing no sign of losing its decorative shape. The ripples continued to wash in But it served no purpose, and as it became sodden it began to overload the weak afterdeck which supported it. All the storm waves which had washed over the peaked stern had caused it to absorb quantities of sea water over the water line. Since the stern was broad and thick and stood taller than the cabin roof, it must now, in its waterlogged state, weigh at least a ton. Should we lop it off? Then perhaps the bottom would float up again. But it was like cutting the tail off a swan. We had not the heart to cripple our proud craft.

But how, how, how the devil had the creators of this extraordinarily ingenious vessel succeeded in keeping the flaunting tail in the air without a rope to pull it up? On the contrary, it had had a rope which pulled it down towards the deck. The boat-builders from Chad had fortunately dispensed with that. We had not missed it up to now. Or? Or! I threw down the coconut which I was scraping out and began to draw frantically. Well, blow ing-oar weighed us down, and the could only have supported the strain me down! I shouted for Norman, Santiago, Yuri, Carlo, the whole crew. I had found the mistake. We had not known how to put the curly tail to its intended use. Only bitter experience could have shown us that, too, because all those who had learned the purpose dulate. But it must not be allowed to of the curly tail from its inventors had been in their graves for thousands of years. The peculiar arch over the





We tied the bowstring in position, but it was too late now. After three, weeks the afterdeck had developed a kink and without a fixed point in the air over the tailtip no rope could repair the damage. We were the sufferers because we, like all the others, had assumed the peculiar arch of the tail to be the ancient boat designers' end whereas it had been their ingenious means.



IIII uri and Norman stood in the puddle of water astern, staring at the slowly sinking golden tail. Suddenly they began to sing with one voice:

"We don't want a yellow submarine, a yellow submarine, a yellow submarine" ...

They did not want a yellow submarine and neither did we, so soon all seven of us were standing in the stern, singing Yuri's refrain in chorus. No one took it more seriously than that. Indeed, the rest of the boat was bobbing like a champagne cork, so Yuri and Norman set about washing socks and trying to find a rhyme for "submarine" . . .

While the weeks passed with the seven of us in the cramped cabin crowded together as if we were at a non-stop party, Ra rolled on in the center of an unchanging horizon which accompanied us like a magic circle. From June 4th to 9th the sea

fitful, and some of the men felt the urge to sleep at all hours of the day. The papyrus had stopped whining that mankind really was in the process and growling and had begun to purr of polluting its most vital well-spring, like a cat enjoying the sunshine. Norman disclosed that he was worried. We were drifting slowly southwestward and unless the wind returned there was a risk of our being caught in the eddving currents off the coast of Mauritania and Senegal. We had come into one of the trans-Atlantic shipping lanes, constantly sighting passenger steamers and cargo vessels far and near, and on the night of June 6th a big, lighted ocean liner headed straight for us. It was steering so directly towards us that the officers on the bridge could not possibly have land, as long as every nation allowed spotted the glow from our little paraffin lamp at the masthead, so we gesticulated violently with our torches. The reluctant wind gave us very little chance of escaping with the help of the rudder-oars. The monster racketed along, lights blazing, and was beginning to loom threateningly over us when it suddenly turned towards our starboard beam and silenced its mechanical thunder. Some angry reprimand was flashed at us from the bridge, so fast that we could_ only catch the word "please" before the giant glided silently past under its own impetus, a few hundred feet from the papyrus bundles. Then the propellers were churning the water again and the steel giant rumbled on its brightly lit way to Europe.



ext day we were sailing in slack winds through an ocean where the clear water on the surface was full of drifting black lumps of asphalt, seemingly never-ending. Three days later we awoke to find the sea about us so filthy that we could not put our toothbrushes in it and Abdullah had to have an extra ration of fresh water for his ritual washing. The Atlantic was no longer blue but grey-green and opaque, covered with clots of oil ranging from pinhead size to the Plastic bottles floated among the cloves. The bridge began to creak waste. We might have been in a and sway and had to be hastily re-

ran in gentle combers, the wind was like this when I spent 101 days with my nose at water level on board the Kon-Tiki. It became clear to all of us our planet's indispensable filtration plant, the ocean. The danger to ourselves and to future generations was revealed to us in all its horror. Shipowners, industrialists, authorities, they would all have seen the sea gliding past at a fair speed from an ordinary ship's deck and would never have until Georges put her in her special literally dipped their toothbrushes and noses in it week after week, as we had. We must make an outcry about this to everyone who would listen. What was the good of East and West fighting over social reforms on our common artery, the ocean, to become a common sewer for oil slush and chemical waste? Did we still cling to the medieval idea that the sea was infinite? ...

On June 13th an icv north-northeast wind was howling through the stays and whining in the wickerwork cabin walls, while the seas rose higher reeds bent in the water. The floor, and boiled more savagely than anything we had seen up to now. There were howls, creaks and groans from every section of the heaving vessel and breakers running across each other and over one another's backs crashed aboard aft. A few wave peaks sent tons of water surging over us at a time and we could actually see the stern section sinking gradually deeper under the pressure of the heaviest cascades. There was nothing we could do but wait until the masses of water had rushed out again on both sides of Ra, leaving us with our once popular bathing pool now knee-deep in water. Abdullah was in high spirits and assured us that this misfortune aft was unimportant. We would not sink as long as the ropes held ...

From June 14th to 17th the sea was constantly seething round us and inexplicably high waves crossed one another from two or three directions at once, an interplay of currents and counter-currents from unseen coasts. Georges had pains in the back and had to be helped to bed. Abdullah was sick, but cured himself with a dimensions of the average sandwich. concoction of twelve boiled garlic squalid city port. I had seen nothing inforced with fresh ropes and stays.

Yuri had the bright idea of moving Sinbad the duck aft, where she swam about happily in the inboard pool. Safi was so cross that she got diarrhea, but kept to the outer edge of the papyrus rolls as always on such occasions. She had become incredibly clean. Suddenly a school of tunny fish, about six feet long, shot out of the water, frightening Safi into hysterics so that she hid in a basket and no one could persuade her out of it sleeping box inside the cabin, after dusk.



nce again the masts were jumping in their flat wooden shoes, while Ra writhed about in the wildest gymnastics to follow the chaotic dance of the waves. She was making a new, hoarse sound we had not heard before. It sounded like a mighty wind roaring to and fro as our ten thousand bundled walls and ceiling of the basket hut were also twisting and heaving with a new sound. The boxes beneath us jammed askew, so that the lids stuck, and we could lie, sit or stand on nothing which did not twist us with it. The stays were holding the masts in ominous tension, but we dared not slacken or tauten them in these powerful seas. It was bitterly cold, but Georges, Yuri and Norman all took a swim under the reed bundles for safety's sake. They came up and assured us with chattering teeth that the papyrus below us was in perfect condition, but now the sagging stern section was exerting a real braking action. Something must be done.

Then the starboard rudder-oar tore itself loose from the steering bar and danced madly in its efforts to wrench itself free of the steering bridge as well. There was a fierce battle in the deluges of water before we captured it and bound it in place with our thickest rope. There were fish everywhere and Georges managed to spear a dorado in the chaos. Something must be done to check the water which was at last breaking in with insane fury aft. How long would the stern section support this mighty strain? A wooden boat would have broken in two.

We must try to stem the flood of water. We collected all the spare papyrus we had and Abdullah, assisted by Santiago and Carlo, stood up to the thighs in water aft, tying on papyrus rolls as a bulwark against the seas. The water rose to their chests when the worst seas sent their crest surging on board. Abdullah was washed overboard several times, but clung to his life line and only laughed as he scrambled on board again. After all, he was wearing his magic belt. When the work was finished he gave thanks to Allah ...

On June 17th the storm reached its height, the wind turned westward and the high seas grew calmer. We found flying fish everywhere; there was even a little creature floating in the coffee pot. We must have returned to the main current, for, thanks to a momentary gap in the heavy cloud ceiling, Norman was able to report that we had sailed 80 nautical miles, or 148 kilometers in the last twentyfour hours, even with a broad, sagging stern slowing us down like a lobster's tail. That counted for something, even on the map of the world.

During the worst of the storm we moved about 500 nautical miles off the West African coast, heading straight for the Cape Verde Islands west of Dakar. Both the north wind and the current were carrying us straight towards this large group of islands which might loom up around us at any moment, and this gave us an uncomfortable feeling of insecurity as we drifted and struggled in the storm with an intractable stern section behaving like a yellow submarine. One late evening, when the thought of the islands out in the darkness was haunting us badly, Norman took out the US Sailing Directions for the area we were in and read aloud to us by the light of the paraffin lamp. It swung from the heaving ceiling, making our shadows dance about us, distorted and elastic, in time to Ra's deafening spectral orchestra.



W e learned that cloudbanks and haze could lie so thickly round the mountainous Cape Verde Islands that the surf against the rocky coast often appeared before land itself had been slipping under us and lifting us up sighted, although the highest peaks anymore. They were creeping over reached 9,000 feet. In addition there our stern and pushing us down. The were powerful currents round the isnight before, a big sea had crept right lands, so treacherous that they had over the cabin wall and I was caused innumerable shipwrecks. The awakened by getting a bucket of cold heavy rollers round the island group water on my head. Salt water was were most active when the moon was running down inside my sleeping-bag. changing. "Great caution is therefore "We are starting with a handicap," necessary when navigating in the I admitted to the others. vicinity of these islands," Norman It was then that Santiago threw a concluded his reading. match into the powder keg.

"Listen to that; be cautious, chaps," remarked Yuri, pulling his sleepingbag up and his leather cap down until they met at his nose.

It so happened that the moon was boats, so just let's cut up the rubber raft as well." changing just then. The night was as pitch black as the day was misty. For "I mean it," said Santiago. "We the last four days the islands had lain must try to raise the stern. We have no straight ahead in our line of drift and papyrus left, but the life raft is made now they must be lying somewhere of foam rubber. We can cut it in strips just in front of us. They might appear and use it in the same way as the that night or next morning, if we were Egyptians would have used spare caught by a strong southerly crosspapyrus." current. Rain was failing from low "He's mad," came mutters in sevclouds and neither sextant nor "nasoeral languages. meter" could tell us where we were. But Santiago was obdurate and June 18th was a dramatic day. The refused to give in. Cape Verde Islands must lie some-"You brought a life raft which only where ahead or across the port bow, takes six men and there are seven swathed and hidden in fog and rainof us," he challenged me. "You exclouds. Just two weeks ago we had plicitly said you would never get into it yourself." passed the Canary Islands at close range without seeing them through "The next size up was a twelve-man raft," I explained. "That was too big. the cloudbanks. But today more But it's true that I shall stay on our serious problems were brewing up than the ones which lurked beyond nice big reed smack if you six decide our decks. We had been together in to move to that tiny little rubber tolerance on the papyrus bundles for thing there." twenty-five days and the reed had "Me too," said Abdullah. "Let's cut been floating in sea water for at least it up. The wooden case is just gnawing away our ropes." a month. Despite all our adversities Ra sailed over 2,000 kilometers round "No," I said. "The rubber raft is

meant to give everyone a feeling of the whole north-west coast of Africa security. This is nothing but a and now the voyage across the Atlantic scientific experiment. Without the from continent to continent was to begin in earnest. If the Egyptians had rubber raft no one on board would be sailed as far from the mouth of the able to leave the papyrus boat." Nile as we had now sailed from Safi "Come on, where's the saw, what's the good of something we will never harbor they would have been far up use?" insisted Santiago provocatively. the Don, in Russia, or beyond Gibral-The rest of the crew were indignant, tar. The Mediterranean was obviously not big enough to exhaust the range but everyone went aft to have a look, of a papyrus boat. at least, at the heavy packing case But damn that stern section! If which Abdullah wanted to get rid of.

only the ancient scribes had left directions, we would have understood the principles of the papyrus boat in advance; then we could have looked forward to crossing the ocean without problems. Now the waves were not

"Let's cut up the life raft," he said suddenly.

"Of course," I said. "Now we have broken up the two little papyrus

There was no ship behind the back wall of the cabin anymore. The only thing which projected out of the water there was the curved tailpiece which rose in lonely majesty, separated from the rest of Ra by the rippling





A herdsman's rolled-up papyrus tent doubles as a life belt in an ancient bas-relief and inspires Georges, present-day Egyptian crew member, to try the same. waves which swept across from one side of the boat to the other. The case with the life raft in it was sloshing about in green water between the legs of the bridge.

Abdullah seized the axe which hung ready, but Yuri protested furiously. It was absolutely crazy! We must think of the people at home. Norman agreed with Yuri: our families would despair if we had no lifeboat. Georges took the axe from Abdullah. Carlo began to waver. He wanted me to take the decision. For the first time on the voyage a serious breach was opening. On a vital decision, opinions were sharply opposed and both parties grew steadily more bitter in their uncompromising claims.

We sat all together on the foredeck, on our goatskin containers, sacks and jars, while Carlo served salt meat, onion omelette and Moroccan sello. But this was the calm before the storm. The dry reeds in the papyrus deck at our feet bent and straightened like strips of paper, keeping time with the seas which were still high and choppy. The reed was stronger under water where it was wet. With our two spliced rudder-oars lashed fast and her lobster tail hanging down and acting as a brake, Ra steered herself before the wind. Yuri, Norman and Georges resembled the murky thunderclouds hanging over us on all sides, as they grimly cracked almonds in their fists, prepared to defend their position. It was essential to lance the boil.

"Lots of odd things could happen," I said, trying to keep my voice cheerful. "Let's think about all the situations where the life raft might be useful. I'm most scared of someone falling overboard."

"I'm most scared of being rammed by a ship," interjected Norman, "and then of fire on board."

"The bows are floating splendidly, but not the stern," said Yuri. "No one knows if we will still be afloat in another month's time."

"True enough," I admitted. "And it's still theoretically possible that the skeptics are right and the papyrus will gradually rot and disintegrate in the sea water."

"What I'm scared of," came quietly from Georges, who was never afraid of anything, "is a hurricane."

No one could think of more than these six good reasons for keeping the

life raft in reserve. But six reasons counted on our fingers.

Everyone felt safe because we were ruling out that emergency. all roped up like mountaineers. We also had a life belt trailing on a long rope astern. If a lonely night wanderer stumbled over the jars and fell overboard, launching the life raft would not help him. First of all, the life raft was intended for extreme emergency and could not be launched without cutting down the entire bridge. Furthermore, it was deep and rectangular, with two inflatable tents which opened both below and above deck, no matter which side came uppermost. It was thus not intended for fast sailing and would be left far behind Ra even if we lowered the sail. The life raft would be of little avail if a man fell overboard. No argument about that one.

Second possibility: collision. Everyone agreed that if Ra were split in two we would not have time to launch the raft, and if it was already afloat we would still all prefer to clamber back on the much larger remaining portion of Ra.

Sahara, Ra would have burned like might even rip off the sunken stern. tissue paper, but here it would be difficult to set fire to her. In any case we had a fire extinguisher. Smoking was only allowed on the lee side, where sparks blew overboard, and the windward side was so soaked with water that it would float, fire or no fire elsewhere on board. No one would prefer the little life raft to the large, wet, unburned portion of Ra.

Fourth possibility: the papyrus might sink under us. One month's experience showed that even if the papyrus absorbed water, it sank so slowly that there would be plenty of time to send out an SOS. But we would also have to send out an SOS if we transferred to the crowded lifeboat. We would all rather be able to stretch out in our comparatively spacious basket cabin than sit tent, waiting for rescue.

Fifth possibility: the papyrus might rot and disintegrate. We already knew from sight and touch that the papyrus experts had miscalculated on this

point. Their laboratory experiments were enough. We therefore agreed to had certainly been made in standing find out what each man would do in water. Everyone agreed wholeheartedeach of these six eventualities. We ly that both the papyrus reeds and the saw we attacked the heavy packing lashings were stronger than ever, so First possibility: man overboard. we were absolutely unanimous in



Sixth possibility: hurricane. More than likely, as we neared the West Indies. A hurricane might carry away Third possibility: fire. In the masts and oars and steering bridge, But we had lived through more than one storm on Ra now and were certain that the tough wicker cabin would continue to cling to Ra's central reed bundles, leaving us a raft with more room, water and food on board than the little foam rubber raft could possibly provide. Nobody would move to the rubber raft in a hurricane.



all in high spirits. No one had preferred the life raft to Ra's reed bundles in any conceivable situation. Yuri was visibly relieved. He grinned and shook his head, marvelling. Carlo laughed. squashed together in that little lifeboat Norman drew a deep breath and was the first on his feet.

"OK. Let's find the saw!"

Everyone wanted to make for the stern, but such heavy seas were

extra load there. Norman, Abdullah, and I waded out. With axe, knife and case and threw the nailed planks and plastic container overboard. That sort of thing was out of place on Ra. The green foam rubber raft came into view. Under it Abdullah was appalled to see that several of the ropes holding Ra together had been chafed through by the movement of the case under the pressure of water. Rope-ends bristled from the papyrus like ghastly skeletal claws. Only the swelling of the reed had prevented the ropes from slithering through and allowing the whole stern to break apart. Abdullah fell on the loose ends and tied them together with extra rope. We stood knee-deep in foaming water and Abdullah showed us how the skin on his legs was peeling in wet white flakes, after all the work in sea water over the last few days. Then I felt one of the mightiest of the towering waves crashing against Ra, lifting us up and twisting us abruptly sideways. I was staggering in an attempt to regain balance when I heard the deafening roar of tons of falling water and breaking timber. The sea surged in up to my waist from behind, while wood and rope yielded to the power of the ocean and slowly collapsed. I was swept to port by the torrent of water and stooped to grab a papyrus rope before I could be washed overboard, when I felt a great weight of broken timber thumping over my back. I heard Norman's voice bellowing: "Look out, Thor!" and had not a moment's doubt that this deafening sound of breakage came from the entire bridge subsiding in its lashings and collapsing over our heads. As our foundations rocked and broken wood held me down in the flurry of water, I expected at any moment to find ourselves being towed along behind Ra on our lifelines while bridge and stern were left floating in our wake. Then the floods subsided and we were left knee-deep as before, I with broken timber pressing me down.

that three men made quite enough

"It was the double rudder-oar that went," shouted Norman, helping to free me.

Above us bobbed the splintered ends of two big logs lashed together. The thick, round original oar-shaft breaking over the submerged deck and the rectangular balk of the spar

mast, bound to it as reinforcement, had broken off side by side. The big oar-blade was left hanging on the ropes, lashing like the tail of an angry whale, but in a flash Norman was there with Carlo and Santiago to haul it in, while Abdullah wrestled alone with the rubber raft, now floating freely, and I myself struggled with a 200-pound keg of salt meat which had suddenly broken loose among the bridge poles and threatened to cause disaster unless it was prevented from crashing about in the cascades of water.

That night Abdullah assured me, when I came out for the change of watch, that we were now surrounded by nice big waves with no nasty little waves on their backs. Ra rode smoothly and rhythmically, with two small rowing-oars temporarily attached where the big port rudder-oar was missing. When we switched our torches on we could see squid swimming as though behind glass as the water rose again on the lee side under us. The Egyptian sail occasionally stood out clearly against bright gaps in the cloud ceiling, but the horizon was invisible in the darkness. What sometimes seemed to be twinkling stars low on the horizon often proved to be plankton twinkling brightly at our own eve level, carried up on an invisible wavecrest.

IIII t certainly felt very odd next day to begin attacking our undamaged life raft with a saw. Norman and I looked at each other and I paused uncertainly for an instant before sending the saw rasping through the canvas cover and into the foam rubber. Then we all set about dismembering our only means of getting away from the boat we were standing on, kneedeep in water.

"People would think we were crazy. No one would understand," said Yuri, grinning.

But the decision was unanimous and well-weighed. The life raft was reduced to narrow strips, the shape of papyrus bundles, then pushed under water and lashed fast to the surface of the sunken deck. The miracle happened. The stern began to rise. It guard rail, legs braced, so as not to

lifted enough to give us better steertumble over while we stared. Cape ing control over the boat, and once Verde? No, a boat. It was heading again the waves slid under us without straight for us. It was signalling. The filling our swimming pool with such flashes were too fast for us to read. floods of water. The event was apbut it was asking about something. propriately celebrated. Little did we "Ra OK, Ra OK," we flashed back dream then that the sea would graduin Morse. The boat was close to us ally steal on board and pluck the sawnnow and we guessed that it was a up foam rubber away bit by bit, until patrol boat from Cape Verde. It was only the natural papyrus stems were rolling violently, while we were calmly left. Neptune might have been telling undulating with the waves. us: "No cheating. Pharaoh's men had "Ra, bon voyage," it finally flashed no foam rubber." So our delight was slowly. Have a good trip. Then it short-lived, but with the disappearturned away and the comforting lights ance of the heavy cradle holding the vanished in the darkness. "Have a good trip," I said to Santilife raft we had removed a dangerous load from the afterdeck. ago as he went to bed.

On June 19th we found ourselves Two hours later I had already dancing in heavy rollers augmented begun to whistle guardedly through by counter-waves from cliffs on shore the bamboo wall to waken Yuri in all which stirred the sea into indescribthe noise. He was to relieve me, but able turmoil. The deck of Ra billowed the others must be left to sleep. Then like a carpet and in some places dry I felt as if Neptune himself had taken papyrus crinkled itself into little curls hold of the oar blade out there in the blackness of the sea. Vast forces on top of the bundles. Between mast and cabin, where two men could wrenched the oar from me and the usually walk side by side, one man had whole vessel heeled, while white furies to watch out before slipping through thundered out of the darkness and alone, and the little gap between buried everything under my legs. The bridge and cabin wall opened and bridge vibrated and the crack of closed like a nutcracker. If we sat on breaking wood was loud in my ears the narrow crack between two of our again. Was it the bridge collapsing this sixteen boxes in the cabin, we were time? No. It was the other rudder-oar nipped in the bottom. For the first Now we had nothing to steer with. time a clay jar was crushed to pieces I had to yell through the wickerwork and the nuts ran out, to Safi's delight. and rouse everyone. The sail thrashed. We discovered that another was empty The water seethed. Ropes and timber of water because friction with the screamed louder than shouted orders. It began to rain. We threw out both neighboring jar had ground a round hole in its side. The starboard rudderour sea anchors. Then all was well. oar was repaired and launched, while "They wished us a good trip," said water gushed round our bodies, but Santiago, staring out into the night. soon afterwards there was another We felt alone as never before. There crack and the blade was floating astern was no light to be seen now from land again, while the sail swung round and or ship. At last the whole Atlantic lay imprisoned Carlo and Santiago, who open ahead of us. "Good watch, Yuri. You have no were busy tapping water from a goatskin. They were bowled over towards problems-nothing to steer with." the open railing and would have finished up in the sea had they not Although Ra I didn't make it, it been roped up. A big flying fish sailed proved a crucial point: reed boats, if on board and swam happily round properly constructed, are seaworthy. for a long time in the pool aft while The question was how to insure proper Abdullah floundered about vainly construction. A few months later, Heyertrying to catch it. dahl, with the help this time of reed In the struggle with rope and sail boat craftsmen from Lake Titicaca high in the Andes, found the answers and set sail again in Ra II. Fifty-seven days later the crew docked the apparently fragile craft at a quay on Barbados.

and broken rudder-oars I got my hand pinched and it was hurting even more that night when I came on deck to relieve Santiago. He pointed silently to a light to port. We clung to the or the first couple of hours the 23 passengers aboard the Aramco DC-3 chatted, joked, drank coffee and wandered up and down the narrow aisle visiting friends and colleagues. But as the plane droned on, increasing numbers of the all-male manifest, wearing the *thobe*, *ghutra* and *agal*, crowded up to the windows, craning for a glimpse of the landscape below. For the majority of the passengers on that flight recognition of some detail on the ground would come easily. They were going home to az-Zilfi.

What they saw first, however, as the DC-3 circled to land, was a large tent in white, yellow and orange canvas standing off by itself beyond the village of Marakh. They knew it immediately: Aramco's Mobile Oil Exhibit, the company "road show"

which has been telling the story of oil to the people of Saudi Arabia for 14 years and was now, with their help, about to put on its final performance.

The men in the plane were all Saudi Arab employees of Aramco, every one of whom had gone east to work for the oil company from the agricultural region known as az-Zilfi, some 160 miles northwest of Riyadh. They were making up a delegation Aramco was flying to their home town for the ceremonial opening of the show in a pattern which has been repeated almost 50 times as the exhibit has traveled into every part of the inhabited kingdom, telling the story of Saudi Arabia's largest industry to some 1.5 million Saudis.

There was a difference this time: the stay at az-Zilfi, would mark the last time that the exhibit would be shown under canvas. From now on the show is to be one easily transportable unit, moving from one location to another in a large, speciallydesigned van able to get into places the more cumbersome "big-top" version could not.

No one on the scene that warm spring morning in az-Zilfi, however, was thinking in such terms yet. There were velcomes, introductions all around, effusive embraces and a formal group photograph of the company delegation. Then everybody piled into local conveyances and headed into Marakh.

These conveyances, you notice, are without exception of a strictly utilitarian order, as sure an indication as any of the area's remote, rural character. They are almost universally in the form of pickup trucks, and are more apt than not to have four-wheel drives, with Japanese Toyotas and Datsuns highly favored. But the star attraction to us was a short, stubby 16-passenger bus with a Chevrolet chassis, a venerable bright-orange body fabricated long ago in Carbondale, Illinois, and a number of local refinements, including a large giltframed mirror inside the windshield which gave the driver a rear view of truly panoramic dimensions.

On the way into town the bus stopped at the recently founded Nadi Marakh. Nadi means simply "club" in Arabic, and there are organizations like the Marakh Club in just about every community in Saudi Arabia. Essentially they are sports clubs for



the young men of the town, and they usually field a house soccer team which competes with other soccer teams in league play. These sports clubs double as social centers for their youthful members, and the Nadi Marakh is typical in that within its charming, white-washed old building, with its high palm-frond-matting and wooden-latticework ceilings, there is a combination meeting room/lounge, a small library and a space set aside for table tennis. It was untypical in that one wing was a museum whose contents one would more likely come across in, say, Sudbury, Massachusetts, than in the middle of Saudi Arabia, where there has been little time and less inclination to dwell on the recent past, not to say assemble artifacts.

The objects on display correspond roughly to the warming pans, bayberry candle molds, cobblers' benches and handlooms typically found in preserved historical houses of New England. All carefully labeled, here in az-Zilfi were wooden bowls, fiber mats and sandals, a gigantic black copper pot for boiling rice, wooden wheels for drawing water out of wells with the aid of donkeys, a box-like contrivance in which a Bedouin woman could ride a camel completely out of view. They were everyday objects used by ordinary people of the area, a few of them admittedly right up until the present. But someone in the Marakh Club realized that, if they had not already become so, all of these objects would be obsolete in a matter of time, and possessed the vision to round up examples of each for the benefit of what he obviously assumed would be posterity.

Meanwhile, the Aramco delegation was assembling in front of the Amirate to begin the afternoon's festivities. As



The official company delegation poses with local dignitaries. the visitors filed up to the main entrance of the local government building, a half-dozen boy scouts, dressed in neat, light-blue uniforms and peaked caps, snapped to attention, clicked their heels as one, and gave them a smart salute. The scouts were to do honor duty for the rest of the day.

Pre-luncheon refreshments on this particular occasion were of a kind always served in Arabia at such functions: trays of fruit juice, hot, very sweet tea in little glass tumblers with handles, and coffee heavily laced with cardamom. Then a scout entered carrying in front of him a kind of urn of burning sandalwood incense. He made a circuit of the room, solemnly pausing in front of each chair to permit its occupant to whiff the aromatic smoke, Finally, the amir. Shaikh Muhammad ibn Dulaym, took the urn in his own hand, and the vast desert area of Saudi

added a fresh sliver of sandalwood, pronounced the Arabic equivalent of 'Welcome,'' and holding the urn high led his guests to another section of the Amirate to dine before moving on to the exhibit grounds for the opening.

The procedure of formally opening the Mobile Oil Exhibit had not changed much over the years, but each village, town and city which the show visited correctly looked on the inaugural ceremony as a signal event meant to honor them, and the occasion never failed to put the host community into a holiday mood. By the time the visiting group had arrived on the scene from the Amirate most of the spectators' chairs, borrowed for the afternoon from a local secondary school, were occupied, and someone was running a test on the amplifying system.

Presiding on the rostrum on behalf of Aramco was Muhammad Talib, who for a long period of its existence traveled with the Mobile Oil Exhibit as its on-the-spot supervisor. Talib introduced Abdul Aziz Falih, a superintendent in the oil company's materials supply organization and a native son of az-Zilfi, who had been chosen to head the exhibit-opening delegation. This position gave Falih the nonor of sitting on the Amir's right during the majlis gatherings and of delivering the welcoming speech at the ceremony itself. He then invited Shaikh Muhammad to preside over the inevitable ribbon-cutting function at the exhibit entrance. To Muhammad Talib fell the agreeable task of guiding the amir and his party of local dignitaries through the tent before the gates were opened to the general public.

The most recent exhibit tent used, which had been designed and executed in Italy, came in four sections, a large, high entrance area, round in shape, off of which ran three rectangular canvas pavilions, each with its own separate theme. The central rotunda was dominated by a soaring scale model of a drilling rig, which stood in the middle, portraits of H.M. King Faisal and H. R. H. Amir Khalid ibn 'Abd al-'Aziz, the Crown Prince of Saudi Arabia, color blowups of Aramco's Sea Island, an oil-loading facility off Ras Tanura, Aramco's Administration Building in Dhahran

Arabia known as the Empty Quarter.

The first of the three tent wings contained exhibits designed to explain how man derives and harnesses energy in all its forms-from the sun, the wind, water, coal, steam, atoms, and petroleum. In this section-in reality a miniature science museum-visitors could examine and wonder at a solar



A local club has assembled a museum of crafts and folk art. stove, an early water pump, and cutaway models of a coal mine, a kiln and a turbine plant. Here too were well-made models of a lateen-rigged sailing craft, an old-fashioned locomotive, the now moth-balled nuclear ship Savannah, a modern oil tanker, and the latest jet commercial aircraft being flown by Saudi Arabian Airlines.

Another wing was designed to depict the whole "Story of Oil." Beginning at the very beginning, at an artist's rendition of the Dinosaur Age, a visitor could follow the process of the discovery of oil by geological means, the production of oil from deep in the earth to the wellhead, oil shipments through pipelines to processing plants and then on to distribution points down to the retail level in Saudi Arabia and abroad. The petroleum wing contained a large map of Saudi Arabia showing Aramco's current concession area, color-photo murals and a detailed model of the company's Ras Tanura Refinery, bar charts comparing Aramco's oil production through recent years and views of motor hotel/service station complexes in Europe, where much of Aramco's oil eventually goes. At one end of the wing there was an outsized world globe able to revolve on its axis, on whose surface was delineated those areas of the earth where oil reservoirs are known to exist.

The ways in which the oil company's Saudi employees spend their leisure hours, Aramco's non-oil endeavors to benefit its surrounding communities, and the traditional and modern faces of Saudi Arabia were

the main themes of the exhibit's third wing. Entering this section, the fairgoer could hardly miss at the far side of the pavilion a gigantic photo-mural of today's Jiddah, which dominated the tent. Set up on the floor of the wing were photo cases and models on the subjects of education, agriculture and new industry in the kingdom Perhaps the best-viewed feature of this section were the large color photos of the Islamic holy places in Mecca and Medina.

Even while Shaikh Muhammad and his aides were touring the inside of the Mobile Oil Exhibit some of the ordinary citizens of az-Zilfi were getting an unofficial view. These were some little boys in long white thobes with gufiyas on their heads who discovered that they could get a pretty good look at the show's wonders by peeking under the canvas sides. It was not long, however, before the main entrance was thrown open to everyone. Meanwhile, the amir was again out on the landing strip, this time to bid farewell to the Aramco delegation, which took off in the twilight for the evening flight back to Dhahran.

During the first half hour the exhibit was open to the public the crush was terrific; it seemed that everyone wanted to take in everything at once. This eagerness and intense curiosity showed themselves in an odd way. The people not only pressed up to look at and study the exhibits on display; many were trying to touch everything in sight, as if to make certain they were real. At one time the big globe, whose land features were shown in relief, seemed literally



Employee Abdul Aziz Falih welcomes guests at the opening.

to be covered by hands. Exhibit at- not only introduced "live" movies to tendants admitted that this tactile inmuch of the kingdom, but the instituquisitiveness, while demonstrating a tion of the drive-in theater as well. healthy interest, was mighty hard on During each one-and-one-half-hour the displays themselves, and allowance movie showing the Oil Exhibit prefor this visitors' trait had to be taken sented two films. The fare consisted into account when the items on view of titles dealing with some aspect of were made and assembled. petroleum, features produced for the For the rest of its 13-day stay in most part by Aramco, and health and

az-Zilfi the Mobile Oil Exhibit settled down to normal routine. Mornings were given over to special showings by invitation to the schools in the area. Ahmad Yousef. who had charge of the tent show during this period, and exhibit has toured some Abdul Ghafoor 50 Saudi towns and al-Muhsin, his deputy, gave many in remote and lectures to groups isolated areas of the kingdom. of students touring the exhibit and answered questions on points not covered in their talks.

hygiene, general science or sportsfor instance, filmed highlights of a The Oil Exhibit was open to the world championship soccer match. public at large seven days a week, Undoubtedly, the all-time most popuincluding holidays, from about four lar film shown was one entitled "The in the afternoon until the time of Island of the Arabs," an imaginative survey of modern Saudi Arabia's sunset prayer. At the end of the evening prayer period the tent heritage which contained graphic entrance was again open for more sequences of the 1902 capture from viewing, and attendants were ready to the House of Rashid of al-Masmak present an additional offering out of Fort in Riyadh by 'Abd al-'Aziz ibn doors, a feature which over the years Sa'ud. The victor that day was to proved to be even more popular than make many more conquests, unify the displays under canvas. In a country desert land into one nation, and bewhere there are no public cinema come the illustrious founder-king of houses, the showing of movies could present-day Saudi Arabia. The outhardly miss. come of the fierce skirmish 70 years Although television carried by a ago in Riyadh made all these subsequent events possible, and audiences at the exhibit thoroughly enjoyed booing the "villains," the men of Ibn Rashid, and cheering wildly the brave exploits of young 'Abd al-'Aziz.

government network is now a regular staple in Saudi households from coast to coast, countless residents of the country have seen their first motion picture projected on a big screen at The origins of Aramco's Mobile showings given in conjunction with the Oil Exhibit. The ground in front Oil Exhibit can be traced directly back of the tent was always filled in quickly to September 1954, when Damascus, in the evenings, and the area im-Syria, played host to its First Intermediately behind was invariably national Fair. The Kingdom of Saudi crowded with vehicles parked chock-Arabia was one of many nations to ablock, facing inward. The women of participate in this big industrial and Saudi Arabia still keep very much out trade exposition, and its government of public view, but the menfolk early asked Aramco to set up an exhibit discovered that they could bring their within its pavilion. During the followwives to the movies in the family car ing three Septembers the oil company with complete discretion. Aramco has again joined forces with the Saudi



displaying a model of its Ras Tanura Refinery, cutaways of internal combustion and jet engines, and several photo panels on petroleum and related subjects. Aramco teamed with the Trans-Arabian Pipe Line Company in sponsoring impressive pavilions of their own at international petroleum congresses held in Cairo in 1959 and 1965, and sent some petroleumoriented displays to Lebanon in 1960 for an American University of Beirut Commerce Students Society exhibit.

The first time Aramco exhibit materials went on view in Saudi Arabia itself was in the late spring of 1955, when the company complied with a request for a contribution to a school exhibit being set up in Mecca. It was a modest beginning indeedjust a couple of photo cases on oil subjects arranged among examples of children's art and handicrafts. By the time it acquired its first tent, had put it up in Jiddah, Riyadh and Hofuf, and had watched almost 200,000 people troop through, Aramco realized it was in the petroleum exhibit business for good. The company set about making long-range plans to satisfy what it recognized as a genuine nationwide hunger for knowledge exhibit itinerary had been drawn up, of revenue.

During the second half of 1960 Aramco had its tent—in those davs a two-section green-and-white affairinstalled in Rivadh and back again in Jiddah for stays of six weeks at each location. The following year the Mobile Oil Exhibit could be found in the east-coast port city of Dammam and in Buraidah, in north central Saudi Arabia, where it made its debut in the hinterlands. By 1962 the oil show had made two stops in southwestern 'Asir Province, at Jaizan and at Abha, places as far in the kingdom as it is possible to go from the scene of Aramco's oil operations.

The mere act of getting the Mobile Oil Exhibit to Jaizan, a port town near of 45 tons, distributed among 130 the lower end of the Red Sea, was quite a feat in itself. Except by water routes Jaizan was almost completely isolated from the rest of Arabia, so Aramco arranged to ship its exhibit materials down from Jiddah by coastal freighter. Because Jaizan lacked deep-water country, land transportation could be piers the crated tent and displays were employed. Then those 130 crates rode lightered to the shore by sailing aboard 10 10-ton trucks.

Arabian Government at Damascus, dhows. Finding no motor trucks on the scene, the exhibit managers hired donkey carts to move the materials from the water's edge to the tent-show site. In the equipment was a sound motion picture projector and screen. It was in Jaizan that the Mobile Oil Exhibit showed movies at night outside its tent for the first time.

> many appearances throughout the itinerary schedule was always kept kingdom has always been the smoothrunning function of the Public Activities Division. Fahmi Basrawi, who has long headed this important arm of Aramco's Public Relations Depart-



Amir Shaikh Muhammad ibn Dulaym cuts the ceremonial ribbon. ment, would confer with his staff over a map of Saudi Arabia and mark in the route the tent show would follow during its upcoming season. After the ment's Interior Ministry for permission for the tent show to stop at the locations chosen. The ministry, having approved the itinerary, notified the amirs in the communities scheduled for appearances. Before the tent show was due to arrive, a Public Activities employee, acting as advance man, called on the amir of the locality it was headed for and between them a exhibit tent would be put up.

The Mobile Oil Exhibit, in its tentshow format, always traveled heavy. Its displays and necessary equipment, including a power generator that was part of the baggage, weighed a total crates and boxes. In its earliest days, whenever the exhibit made an appearance outside the main urban Brainerd S. Bates is Aramco's chief writer on centers, all of this had to be air-lifted in. More recently, with the construction of good roads over most of the

Putting up the exhibit tent and installing displays inside required 17 days on average. How long the tent show remained in a given locality depended, of course, on the size of the community being visited. In hamlets and villages it would remain for two or three weeks. Good-sized cities played host to the Mobile Oil The organization of the exhibit's Exhibit for five or six weeks. Its sufficiently flexible to allow for extended appearances if demand warranted them.

For the duration of the exhibit's stays in the larger cities and towns the four or five Aramco employees assigned to the show as supervisors and guides were always able to find comfortable housing in apartment buildings or hotels in the locality. When the tent show was set up in very small communities far off the beaten path, however, the problems of finding even a few rooms to rent was fairly formidable.

Attendants traveling with the tent show to the hinterlands had to learn to be quite self-sufficient. They purchased their food requirements in the local *sugs* and took turns at the various stages of its preparation and cleaning up afterward. A few seasons of about the kingdom's largest source the oil company's representative in touring with the exhibit turned some Rivadh contacted the central govern- of the men who experienced it into pretty fair cooks.

> A long chapter of the Mobile Oil Exhibit came to an end at az-Zilfi, but reminders of the "big-top" days will be around for some time to come. The entire contents of the Energy and the Petroleum wings, including the big world globe, went to the College of Petroleum and Minerals in Dhahran as a nucleus of a proposed oil-display suitable spot was chosen where the center that institution plans to organize in eastern Saudi Arabia. The exhibit tent itself has found a worthy cause in the other side of the kingdom. Aramco gave it to the Red Crescent Society, the Arab-world equivalent of the Red Cross, for use as a clinic for health services offered to pilgrims during the hajj season in Mecca.

> > petroleum and a regular contributor to Aramco World.

> > Visitors flocked to the tent show set up at the edge of az-Zilfi (center) to listen to informal lectures, question the quides, examine-and touch-the many exhibits.

