ARAMCO WORLD
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CSF

BANKER OF URUK

Shamash looked at his client. "I know your daughter will not be happy until she is married. And I know she requires a dowry. Would one maneh of gold do you?"

The man looked at his friend. "That is generous, indeed. As to paying it back should my strategy fail—"

Shamash laughed as he clapped his companion on the shoulder. "If it is worth one maneh of gold to a father to get his daughter married, it is worth that much to me, your friend, to see her happy."

After Biktar had enjoyed the joke, he pleaded in vain for the banker to draw up a note of indebtedness. Shamash told him, as he arranged for a clerk to carry the metal, "For a friend, a man inscribes on his heart, not upon a stone."

Early the following morning, with the air already warm and humid, the banker set off to the temple wherein he kept his records of business, taking a clerk with him. He set before himself, in the best light, the tablets of his accounts for the year so far and ran a trial balance to date. The year had been good up till now—not greatly successful, but good. He personally made a balance sheet on fresh clay and sent his clerk to have it baked and then to make a copy for the information of the priests of the temple. From this, the priests would compute the temple's charges for acting as the bank's vaults.

On the fifth day of that early week in the spring of the year of 1700 B.C., Shamash received news from a wise and experienced barge captain who spent his life upon the great rivers, and whom the banker paid a yearly retainer of silver to supply intelligence regarding weather forecasts, trading news and any item that might serve the banking business in judging future loans.

This is an imprinted clay tablet used long ago by a Babylonian banker to record his due bills and receipts for later reference.

And the captain's news was, "The word of the boatmen from beyond Mari is that the snows in the highlands of the Euphrates will melt late this year, and there should be no floods to ruin the canals and bring salt to poison the fields."

This was no guarantee, the banker knew, for the rivers were almost always unpredictable, but these bargemen often had an uncanny way of forecasting. Last year, the captain had predicted big and sudden floods from an early melting on unusually heavy snows in the highlands, with the result that farmers had borrowed heavily to repair their dams and canal walls. With a fair river level this spring, these borrowers should be able to repay the bank, and Shamash would have no need to draw up fresh contracts extending their credit.

Financing farming of any kind had always been, in Mesopotamia as in any other land, a risk; but of what use, ran Shamash's philosophy, was an ingot of the finest gold when there was no wheat or barley to buy for the table and no reeds to purchase for building a snug home?

At the close of the day, when the clerks had gone to their homes and Shamash had put away the last of the clay records of the day's transactions, he stood at the doorway of his premises and looked off across the far fields. To the west was one great river; to the east was the other, the Tigris; and to the south, the Shatt-Al-Arab poured its multitude of waters into the Persian Gulf.

Yes, banking was a risky business where a fortune rose or fell with the unpredictability of the big rivers. But, as Shamash thought of his investments in the very fields of his country, in the goods that rested in the river barges, and in the foreign valuables that came, even now, across the blue waters from Bahrdin and other lands to enrich his own land, he felt a sudden gratification that he was a significant part of the development of his country's wealth and an important instrument in maintaining the health and well-being of her people. ■

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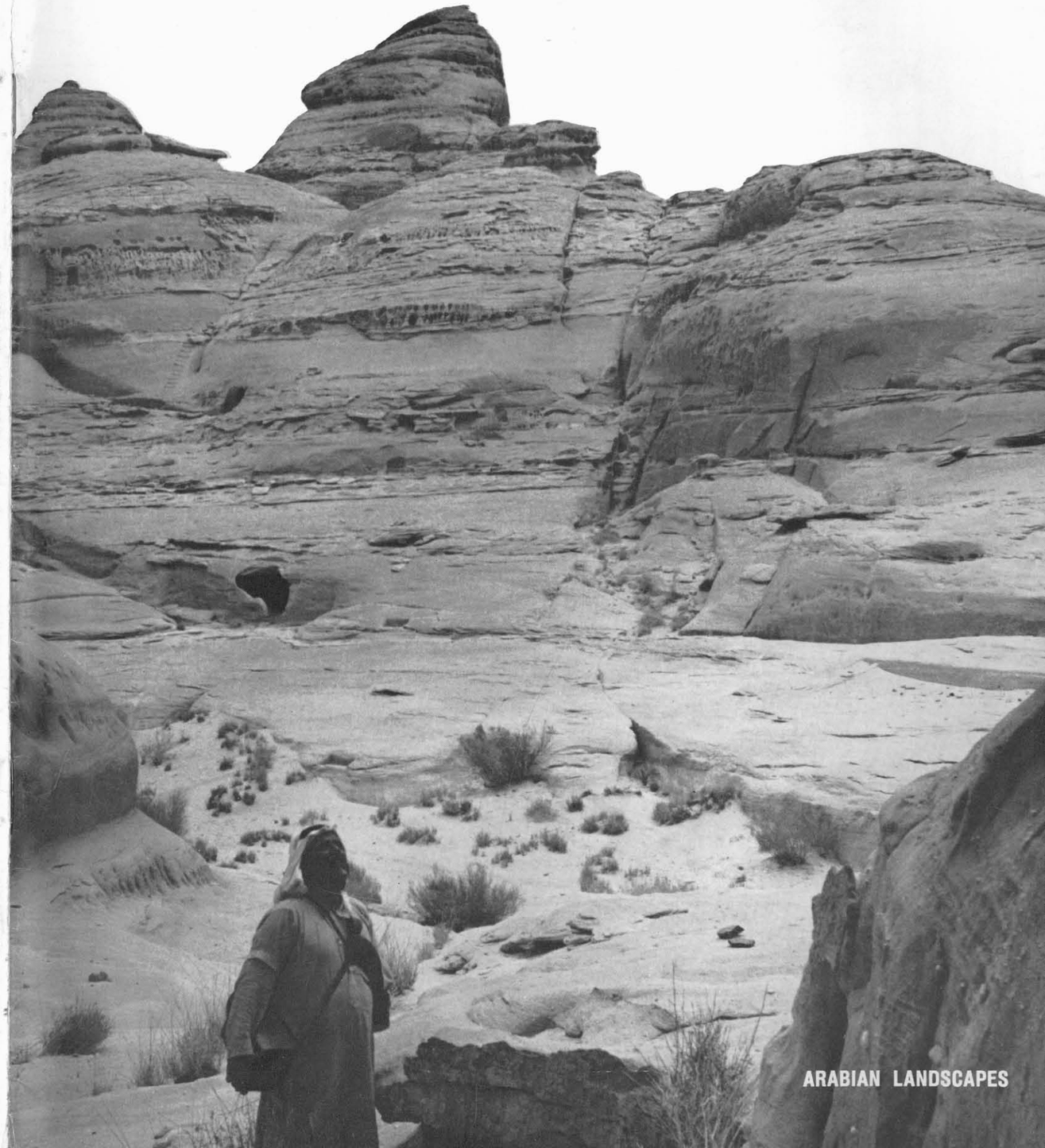

ARABIAN LANDSCAPES

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Portrait of an Editor

Fresh out of school, a young Saudi Arab set his sights on recording — and nourishing — a reawakening of Arab literature

'Abd al-Quddoos (left) gets a hand from his son, Nabeh, who is supervisor of printing in Saudi Arab Government Ministry of Information.

TWENTY-SEVEN YEARS AGO, during *Dhu al-Hijja,* the last month of the Islamic year, a new Arab magazine devoted to literature, science and history slipped quietly into the world. It was called *al-Manhal,* a poetic name that conveyed the image of a mountain spring, a place where one might refresh both body and spirit. The editor was 27 years old. He was optimistic about the chances for success despite outspoken reservations of his faculty colleagues at the Shari'ah school where he had completed his own studies only seven years earlier. He allied his hopes with the "Arab awakening," the cultural renaissance that had begun to gather momentum in the Middle East and North Africa. Although his aim was high, his funds were low. He had, in fact, so little capital that he could afford to have only 250 copies of the first issue of the magazine printed, even though the job was done on an antiquated foot-treadle press. The place was Medina, Saudi Arabia. The time was February 1937.

One evening last summer, Ustadh 'Abd al-Quddoos al-Ansari, now, at 54, a distinguished man of letters in the Arab world — editor, publisher, essayist, historian, poet — sat under the stars on the roof deck of a friend's home in Jiddah and recalled his early struggles to get *al-Manhal* started. At one point the period-piece quality of his recollections was refracted through the piercing whine of a Boeing jetliner coming in for a landing low over the rooftops. He remarked this breach of time, then smiled quietly.

n composing room of printer 'Abd al-Quddoos reads galleys with Linotype man.

Portrait of an Editor

"To start with," he said, *"al-Manhal* had no writers, no readers, and no advertising. I had to sit down and write the entire first issue. I started out with only 40 Saudi riyals – $10.66. I had to borrow to the brim from my friends to pay for the first printing. The paper was the kind you use to wrap groceries in – very poor. The type was set by hand, and there were many errors. But I went ahead. I had the feeling that time would improve the magazine. It was difficult, but the will of God kept me going forward."

Al-Manhal has both observed and served the renaissance in Arab letters which was godfather to its birth. 'Abd-al-Quddoos, who was born in Medina in 1909, has helped to shape more than a quarter-century of Saudi Arab literary history; he himself is a central figure in that history. The American visitor who heard him tell of the beginnings of *al-Manhal* prevailed upon his courtesy for a series of discussions about his experiences as an editor and about modern trends in Saudi Arab literature. Following are the highlights from those conversations.

Was your father a literary man?

"No. He was just a man. He composed some poetry from time to time. He was a religious man who died at an early age in Medina, Saudi Arabia. I have little memory of my father, for he died when I was only five years old."

How did you become interested in literature?

"When I was a student at the Madrasat al-'Uloum al-Shari'ah in Medina the idea of a literary movement was just getting started. My friends and I started the movement in Saudi Arabia. In 1928, my last year in school, a magazine in Egypt called *The Near East* raised a crucial question: 'What form will the awakening of the Arabs take?' I submitted an article outlining my views and proposed that we should have a public press in Saudi Arabia. Our writers needed a place to express new ideas and contribute to the Arab awakening."

Was there a reaction to your proposal?

"When the article was published the director of my school encouraged me to establish a magazine in Saudi Arabia."

What steps did you take?

"Before I completed my final year I applied to the Government for permission to establish the magazine. The Advisory Council to King 'Abd al-'Aziz asked for information about my education, culture and character. They also wanted to see what I had written."

Had you published by then?

"Oh, yes. I had published in *al-Siyasah al-Ushu'iyah,* a weekly political paper in Cairo, and in *al-Ahram* and *al-Muqtataf,* also in Cairo, and in *al-Murshid al-Arabi* in Damascus. I collected the articles I had written and sent them, along with my school and character certificates, to the Majlis al-Shurra, the Advisory Council. They agreed that I should get a license to publish."

How did you develop as a writer, and how did you support yourself?

"Let me go back to my education at the Madrasat al-'Uloum al-Shari'ah. It is a school, by the way, that has many famous graduates – ministers of state, writers, *qadis,* and others. We studied the Koran, of course, and the Hadith, the body of sayings of the Prophet, as well as geography, history, arithmetic, logic, philosophy, grammar and composition. I stood at the head of my class. The Deputy Amir of Medina was the head of the Examinations Committee and he told the director of the school, 'I want this boy to work for me.' After graduation I went to work for the *Diwan,* the Council, of Medina.

"Then the headmaster asked me to come to the school for an hour each day and teach literature to the students. Many of the young men I taught became outstanding writers. But there was something else that interested me. I wanted the students to be able to speak well on their feet, so I started a debating society.

"I also wrote for the *Saut al-Hijaz* newspaper and for *Umm al-Qura,* the official weekly newspaper of the Government. As you may know, the name means 'Mother of Villages'; it is the origin of the word *Mecca."*

Had you started any extended writing – a novel, say?

"About a year after I finished school I completed a long story entitled 'The Twins.' I had it published in Damascus at my personal expense. It ran ninety-eight pages. That was in 1930."

Why did you have it published at your own expense?

"There was no other way for a young writer to get published in the Middle East. This is a typical problem for the Arab writer. The essays you see in the newspapers and magazines are contributions. These are the economic facts of life for our writers. For instance, *al-Manhal* has never been able to pay contributors.

"But, to go on . . . In 1931 I published a book on rhetoric called *Corrections and Reforms in the Diction and Style of Press and Diwans.* In this instance the word *diwan* refers to collections of poetry. I also undertook a study of the ancient ruins, many of them pre-Islamic, around Medina. I went into the mountains on foot and by donkey and made sketches and ground plans based upon my own measurements. After I had collected much original and valuable material I wrote a history of the city and its historic environs called *The Ancient Ruins of Medina.* It was published in 1934 by the Arab Archaeological Society of Medina."

Once you had your license to publish al-Manhal, how did you get into production?

"There was an old and small print shop in Medina and there was an electric press in Mecca on which *Umm al-Qura* was published. But I could not afford to publish in Mecca. However, I corresponded with Muhammad Sa'id 'Abd al-Maqsoud, the publisher of *Umm al-Qura.* Finally he agreed to print *al-Manhal,* and I moved to Mecca in 1937. In 1955 I moved the magazine to Jiddah, where for the first time it was set by machine."

Have you ever had to miss an issue?

"We were suspended for three years during World War II because of the paper shortage. Otherwise, I have never skipped a month."

What is your present circulation, and what countries do you now mail to?

"Each issue has 2,500 subscribers. The magazine goes to Arab readers in most of the countries of the world. It goes to practically every country except Russia."

Is it banned in Russia?

"No, but I prefer not to send it there. They have sent me many pamphlets and other materials. However, I refuse to send them the magazine."

Are there any readers in the United States?

"There are six subscribers in the United States. One copy goes to the Middle East Collection of the Hoover Library at Stanford University. An old friend of mine, Dr. George Rentz, who was with the Arabian American Oil Company for many years, is now curator of the Collection. Another I exchange with *al-Bayan,* an Arabic newspaper in New York. The remainder of the subscriptions in the United States go to individuals."

How would you describe the contents of a typical issue?

"There is an editorial every month. For example, I

Leading Saudi Arab writers frequently gather in the terrace garden of 'Abd al-Quddoos for discussions. Present on one occasion were (left to right) Fuad Shakir, journalist and poet; Hassan Qurashi, poet; the host; and writers Abdul Hamid 'Ambar and Shakeeb al-Amawi.

recently wrote an editorial proposing the development of a Saudi Arab corporation to publish and distribute national magazines. Then there is a literary essay, a short story – which may be written in Arabic or translated from another language – and two poems. One of the poems may be in the old style and the other, modern. Usually there will be an historical essay – or an essay on one of the sciences, or on philosophy, economics, psychology, or sociology.

"The contents vary, of course, from issue to issue. Its main character, however, is the same. The objective of each issue is also the same; that is, to disseminate a mixture of our past Arabic culture and the modern one in order to benefit the reader and provide him with the things that stimulate his mind and enhance his culture."

Is there a letters-to-the-editor section?

"I publish some letters to *al-Manhal,* but they are carefully selected. We get many letters in which writers criticize other writers. I never publish malicious letters that create ill feelings, open up wounds, and leave scars. I look for enlightening letters and comments."

What was the price of the magazine when you started, and what is it today?

"At first it cost subscribers one-quarter of a Saudi riyal. In 1936 the riyal was valued at 3.75 to the dollar. Today, *al-Manhal* costs one riyal – about 22 cents a copy. The magazine is sold entirely by subscription at 12 riyals a year. Printing costs are quite high in Saudi Arabia, and the unit cost of the magazine is one and one-half riyals per copy. That, of course, leaves me with a half-riyal per copy deficit. This is made up through advertising."

Most of the literary magazines in the United States are subsidized by wealthy patrons, by foundations, or by universities. Have you ever had a patron?

"No. There is no such help for the magazine from groups, universities or national institutions. The Government has extended much help to the magazine, foremost of which is free air-mailing privileges inside the country and abroad, placing of ads for some of its Ministries and major branches, and tax exemption for the paper.

"The writers continue to contribute their work in the spirit of the old 'Arab awakening.' They write for the love of writing. We have had contributions from many of the greatest men of letters in the Arab world – all without remuneration. I have mentioned that I once had to write entire issues by myself. Now there is competition to be published and I have a large backlog of contributions from Saudi Arabia, Syria, Lebanon, Egypt, Tunisia, Libya, Iraq. . . ."

We are told that poetry is the most beloved of Arab arts. Has there been any over-all trend in poetry in Saudia Arabia in modern times?

"At the beginning of this century the poetry here was based upon the forms and structure and content of the poems of the ancient days. The language and mode of expression looked back to the beauty and enchantment of the traditional poetry. The subject matter hadn't changed much – love, battles, and the courtly bravery of heroes, for example. But then, a new development began: poetry moved in the direction of politics and sociology and historical comment. During the war between the Hashemite clans and the Saudis, poetry began to take on a strong political flavor. The political poetry, filled with the fervor of Saudi national consolidation, was really remarkable. The poets on both sides also wrote many fine odes. This striving of the poets was as intense as the historic contests between the tribal bards in pre-Islamic times. A newspaper, *Bareed al-Hijaz,* published the poems written by the poets of the two fighting parties.

"Then King 'Abd al-'Aziz completed his conquests and Saudi Arabia was united, and the bird of poetry soared high. When the papers began to be published in the Kingdom during the 1920's the wings of the bird found new strength, for now the young poets gave voice to their thoughts.

"Elsewhere the 'Arab awakening' was gathering force, and the Arab world began to communicate. The stimulus of personal reaction was generated between men of letters in Saudi Arabia and Egypt. During this time new young Saudi Arab poets appeared on the newly-emerging stage.

"This poetic upsurge started about 30 years ago. The first of the new poets to break away from the fixed style of the ancient poetry lived in the Hijaz. They arose in Mecca and Medina and Jiddah. The flare they lit shone to the south, to 'Asir Province and the city of Jaizan. Young poets arose there to take up the torch. The light shone east into the Najd. There other young poets came forward to carry the torch. Since that time the light has continued to shine in Saudi Arabia's modern poetry."

Who are the poets whose innovations have been outstanding during this period of change?

"In Mecca there are Abdul Wahhab Ashi and Muhammad Sa'id 'Amoudi. In Medina there are Sayyid Obeid Madani and Hashim Rashid. In Jaizan . . . Sayyid Muhammad Sansousi, who is called the 'Poet of the South.' Also from Jaizan, Muhammad Essa al-'Uqeili. From the Najd there have been Abdulla ibn Idrees, Muhammad ibn Bleihed, Abdulla ibn Khamis and Sa'ad al-Bawardi. I should also name Khalid al-Faraj, and some others, from the Eastern Province. All of these poets have been published in the newspapers, and some have had collections published."

Has there been any new development in even more recent times? Is there a current trend?

"In Saudi Arabia there is now a considerable friction between the modern poets I have mentioned and an ultra-modern group. It is hard to make the differences clear. Let me try to generalize.

"The first modern revisions of 30 years ago were concerned mostly with the content of poetry. There were some subtle changes in form, but the poets preferred to pour new thoughts into old molds. Now this is important: the feeling for rhyme and rhythms was retained. As you may know, it is possible to rhyme dozens of lines upon the same consonance in Arabic. (I am told you cannot do this in English.) Most important of all, the modern poets of 30 years ago preserved the great force and flow of Arab poetic rhythms – the heart of the old Arabic poems.

"By way of contrast, some modern poets encounter such difficulties in the old rhythms and cadences that they are now attempting to write poetry without them."

As a critic and editor, you have seen these changes in the making. How would you evaluate them?

"There is always friction between the old and the new. Fortunately, there is no question as to the permanent value of the ancient poetry – it is, and has been for centuries, part of the Arab heartbeat.

"The modern poetry that began in the 1930's is stronger and more forceful than the new free verse. It stimulates greater response – it truly *moves* the reader. It wears the robe of tradition and profoundly touches the Arab spirit by means of repeated measure, the pattern of its traditional rhythms, and in the repetition of sounds at the line endings. The free-form poetry has nothing of this quality – this special Arab fire and spirit. It has only scattered images, stumbling dreams, and false ideas in shapeless molds. . . ."

According to a recent study of Arab short stories, there is a movement away from the traditional moral fables to stories that are closer to the daily reality of living. Has this trend affected Saudi short-story writers?

"It is too soon to judge properly. You see, the short story has developed very slowly in Saudi Arabia. It is still mostly a local development. There are good young writers who are evolving their own style. I would mention Muhammad Ali Mughrabi, Muhammad 'Alim al-Afghani, Ahmed Sibaie, Muhammad Sa'id 'Amudi, Muhammad Ameen Yahyah, and Muhammad Zarie 'Aqil.

"There are other outstanding prose writers – novelists, essayists, and so on – who should also be mentioned as outstanding examples in Saudi Arabia of the renaissance in Arab letters: Ahmed Abdul Ghafour Attar, Shakeeb al-Amawi, 'Ubeid Madani, Amen Madani, Hasan Kutbi, 'Abd al-Hameed 'Anbar, 'Abd al-Haq al-Naqshabandi, Muhammad Amin Yahya, Salem Rouehi, Ibrahim Nasir, and Abdul as-Salam Hashim Hafiz."

What about your own writing at present?

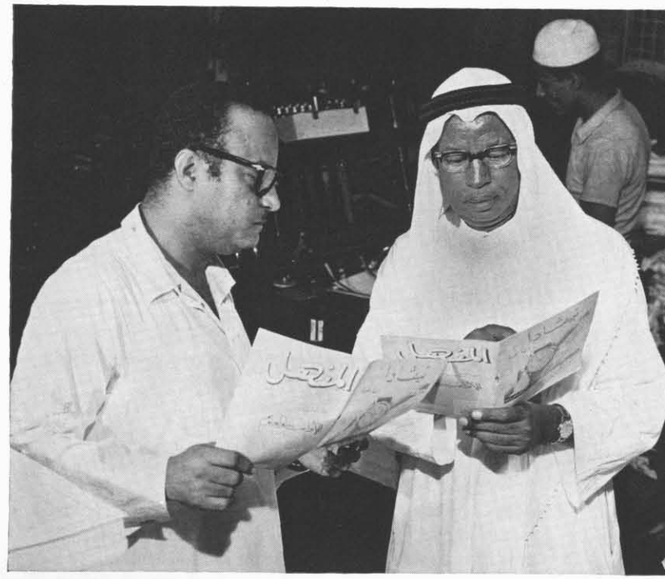
"I have just completed an 885-page history of Jiddah, which was commissioned by the Municipality. I had already written histories of Medina and other historical places in the Hijaz, and the biographies of men of letters from this area, so I was entrusted with the task of preparing a modern history of the city and its learned men."

What will you write next?

"Actually, I should like to take a rest from writing – except for the magazine, of course. I have been thinking about getting together a collection of my essays. I have written hundreds, you know. It would be a matter of selection, and would probably require two or three volumes."

Are there any American or English writers who have impressed you?

"Three writers come quickly to mind – Ernest Hemingway, George Bernard Shaw, and H. G. Wells. Each of them has impressed me in his own way. I enjoy the wit and sarcasm of Shaw. I have been stimulated by the bright and shining ideas of Wells. And I find that Hemingway has an unusual style – he mixes imagination with fact in such a way that he creates a new picture of life. I have enjoyed others, but those three names come quickly to mind."



Muhammad Hussein Asfahani, proprietor of printing firm of Asfahani and Company, checks freshly printed copy of *al-Manhal* with 'Abd al-Quddoos.

Ustadh 'Abd al-Quddoos al-Ansari is a busy man. In addition to his active career as editor and writer he serves in an advisory capacity in the Saudi Arab Government. In order to engage in the conversations reported here he had to set aside time early in the day, in the evening – whenever he could spare the time, sometimes as little as 15 minutes. A good friend, a man of letters, patiently undertook the very difficult task of translating the questions from English to Arabic, and the answers from Arabic to English. At the close of one particularly taxing session, 'Abd al-Quddoos began to speak of the differences and similarities of the poet at work in Saudi Arabia and the United States, creating poems from native materials. His voice rose and fell in measured cadence.

"I believe that poetry flowers from the differences of our countries. In the desert the land is bare; there is no growth. The stars shine clear in the night; the moon is bright, and the barren mountains rise above the long dunes moving under the wind. In the desert the poet's mind and heart are stirred, and his imagination leaps. . . .

"And there is the land where all is fertile – where there are running rivers and waterfalls – where all is green and flowers abound. There, too, the poet's heart is quickened. Such differences are found in our countries. And within each country, too, there are both the flowering earth and the desert. . . .

"In each country the poet's sense grows keen and strong, and poetry yields the nature of the land and the people." ■

FIRST FLIGHTS

It took a special brand of courage for early "aviators" to defy gravity

ONE AFTERNOON in 875 A.D., before less than a dozen people gathered on a hill in Andulusia, Spain, history was in the making. In an attempt to "ascend like the birds," a man jumped from a wall built high over a valley. The resultant flight may very well have been man's first.

According to the notes of some of the scholars who witnessed it, this is what took place:

The tiny group had been called together by Abdul Qasim 'Abbas ibn Firnas. Most of those present were his friends, and by 875 they were used to being startled by the Muslim physician who practiced at the court in Cordoba. This day, however, one of them wrote, "We thought ibn Firnas certainly mad . . . and we feared for his life!"

Ibn Firnas had met his friends in a suit of feathers, with the actual wings of two large birds attached to his arms and legs. After being helped to the top of a wall, which was later described as "several times the height of a man," he addressed the spectators below:

"Presently, I shall take leave of you. By guiding these wings up and down, I should ascend like the birds. If all goes well, after soaring for a time I should be able to return safely to your side."

Then, when a favoring wind appeared, ibn Firnas jumped from the wall. The onlookers gasped. They were certain the doctor would fall straight to the floor of the valley below.

Ibn Firnas did fall. But only for a spell.

Manipulating the two sets of wings in movements he had worked out on paper days before, he quickly checked his descent. Then he flailed his way to an altitude higher than the point from which he had taken off. Gliding for several hundred feet, he turned, then soared back, Exactly as he had promised, ibn Firnas landed on the wall.

"He flew a considerable distance as if he had been a bird," recorded one of the witnesses, "but in alighting again on the place where he started from, his back was very much hurt. For, not knowing that birds when they alight come down upon their tails, he forgot to provide himself with one."

Despite the accident at the end (which did not prove serious), the performance had been extraordinary. But then, ibn Firnas was no ordinary man. In the best traditions of his period, he brilliantly spanned the worlds of art and science.

In addition to his medical duties at the Cordoba court, Firnas was a poet of fair accomplishment, a scientist of note, a student of music and the inventor of a simple metronome. In his home he had built a room in which, thanks to mechanisms hidden in the basement, spectators saw stars and clouds, and were astounded by thunder and lightning. The attempt to fly was only one of ibn Firnas' experiments. After he had successfully demonstrated his theory, he quickly turned to other quests.

For a time, the excited conversations and writings of those who had seen the flight made ibn Firnas a famous man. One of these, the minor court poet, M'umin ibn Said, resented ibn Firnas. He criticized his metaphors and disapproved of his artificial thunder. But in 886 he wrote of the doctor (in a poem which scholars today regard as important scientific evidence):

He flew faster than the phoenix in his flight
When he dressed his body in the feathers of a vulture.

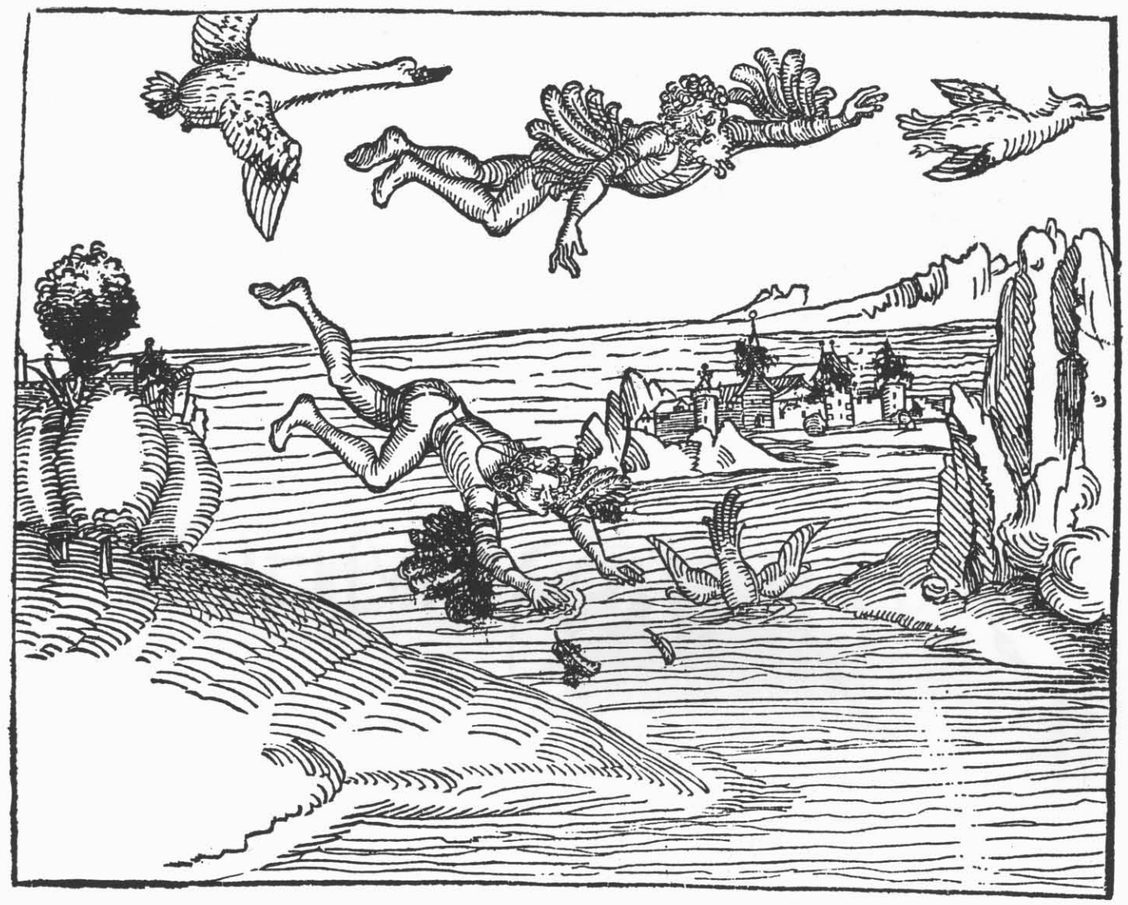
Not long after the deaths of those who had seen the flight, ibn Firnas quietly dropped out of history. The noted Moroccan historian, al-Maqqari, would collect and publish most of the evidence of Firnas' rare accomplishments in the 17th century, but Maqqari's work went untranslated for over 200 years. The result is, even today, remarkably few historians have ever even heard of the versatile Muslim scientist.

There was something about flight which has always piqued man's imagination. Certainly thousands of men before ibn Firnas had dared to have the same dream – if not actually try it. Ibn Firnas, too, recognized that it was not an easy dream to catch and hold – even for a few exhilarating moments. "What man-made machine will ever achieve the complete perfection of even the goose's wing?" he once asked himself in a personal ledger. Indeed, it should be noted that even the gods themselves were not permitted to take the power of flight for granted.

Mexico's "Gods of the Air" were prone to falling into volcanoes. Crete's famed Icarus tried to go too high with his feather and waxen wings – and crashed. The egg of the fabulous roc that carried Sindbad, mortals are warned again and again, was the symbol of "something unattainable" to gods and mortals alike.

If preceding ibn Firnas into the skies were only such assorted and ill-fated creatures from mythology, many of the mortals who followed him proved to be equally unlucky.

After ibn Firnas, the next recorded attempt to fly was made in 1003 by the great Iranian student of Arabic philology, al-Jauhari. He met his death attempting to fly with the aid of an unknown apparatus from the roof of the old mosque of Nishapur in Khorosan. In 1010 came the flight of Eilmer of Malmesbury, a British Benedictine monk. Eilmer's first – and last – flight featured a set of rigid wings he had built of an unknown substance. After jumping out



A sixteenth-century German woodcut, entitled "First Printed Representation of Flight by Man," depicts ill-fated Daedalus and Icarus.

of a high tower, he reportedly glided 600 feet to a disastrous landing in which he broke both his legs. Like ibn Firnas, Eilmer had lacked a stabilizing tail structure such as that found on modern aircraft.

Next came a tragic Saracen, who stood in 1162 on a column in the Hippodrome of Constantinople equipped with a sail-like cloak. He gathered the air for flight and jumped only to crash to his death. There followed Father John Dampier, an Englishman who is said by a contemporary to have taken off from the walls of Sterling Castle "on hens feathers without fatal consequences." Kaspar Mohr, the flying priest of Wurttemberg, also flew, but no one is sure of how he came out of it.

Marco Polo wrote of man-carrying kites he had seen in east Asia. His story set many in the Middle Ages to pondering the secret of human flight with kites and similar apparatus, none of which worked. It remained for Leonardo da Vinci, in the sixteenth century, to lead scientific thought around that particular impasse and back to the sounder thinking of ibn Firnas. Like ibn Firnas, da Vinci felt the answer was locked in the mystery of birds. Although he did not attempt to fly himself, the Italian genius did spend a number of years studying and dissecting various fowl, and on paper at least he invented a bird-winged machine designed to be strapped to a man's back.

Perhaps the most glorious moment in the history of human flight by machine came in December 1903, when on another hill far away from Andulusia two American brothers named Wright contrived to stay up in the air in their machine for 12 seconds and fly 120 feet. Their's was a fitting link in the chain of airborne courage pioneered by an inquisitive Muslim doctor in 875 A.D. ■

MECCA WINTER CARAVAN

For a three-mile-long string

of treasure-laden camels

to pass safely across

lonely stretches of desertland,

every caravaneer

had to know his job

ZAYD, the caravan guide, already riding swift as the wind, strained and goaded his steed for every last ounce of effort. The safety of the annual Mecca-to-Damascus caravan, worth nearly a million dollars, was at stake.

Assigned to scout the territory along the highway, Zayd had just found unmistakable evidence that a band of desert brigands was planning to halt and plunder the rich cargoes as the caravan neared the el-Dakar oasis in the late afternoon. Within minutes he reached a rise in the road where he could see the advance guard riding two miles in front of the plodding caravan, which stretched along the vulnerable trail for over three miles.

Who were these desert travelers Zayd sought to warn, and why was it so urgent that he not fail in his mission?

Since the introduction of the camel to Arabia about 1000 B.C., the Arab economy had increasingly emphasized commerce with distant nations and cities. Located at the crossroads of routes between Syria and Yemen, Abyssinia and Mesopotamia, Mecca became the most important Arab city as the demands of the Hellenistic and Roman world expanded. In spite of the rise and fall of many empires, Mecca's overland caravan trade continued to thrive with few exceptions until modern times.

Trade between Mecca and Europe entered one of its most prosperous periods after Emperor Justinian restored order to the Byzantine Empire with his famous legal code of 534 A.D. So eagerly, in fact, did the European traders seek the gold, silver, ivory, spices, perfumes, dates, and Chinese silk offered by the Arab merchants that by 600 A.D. the annual caravan to Byzantine Damascus was Mecca's biggest business. The economic well-being of the entire Meccan community hinged directly on the accuracy and timeliness of Zayd's warning.

Everyone in Mecca, rich and poor alike, invested in the lucrative caravan trade. All the merchants formed themselves into an association, pooled their capital to equip the caravans, and then shared proportionately in the returns. A 50 per cent return was guaranteed on all investments, since the caravan profits normally ranged between that figure and 100 per cent.

A single prominent family acted as bankers for the association, receiving deposits from interested parties, and then administering the funds as economically as possible. Even the poorest families from the small-tenant and shop-keeping classes saved every available dinar in order to have a share in the venture.

These ancient desert caravans were not small affairs with forty or fifty, or even a hundred camels. Major caravans from Mecca generally required from 2,000 to 3,000 camels, and called for a capital investment in the neighborhood of $450,000. Accompanied by several hundred armed guards, a caravan of this great size afforded maximum security and minimized the individual expenses of each merchant.

Two of these large caravans were launched each year:

MECCA WINTER CARAVAN

one went to Abyssinia during the summer, and the other carried goods from Mecca to Damascus during the winter, when rainfall was more frequent in the Syrian interior.

In spite of the guards and the size of the convoy, how could a merchant be sure his goods would not be stolen or destroyed by brigands operating in the remote desert? An ingenious insurance system placed a single leader from a well-to-do and highly respected family in charge of the shipment. This family was required to repay merchants for any property lost, damaged, or stolen en route.

For this reason, the caravan leader had absolute control over the conduct of the voyage and sole responsibility for its safety. He was usually a man of great personal integrity who was feared and respected by everyone. Naturally, he delegated many responsibilities to lesser officials.

Next to the leader in importance was the caravan's official guide (the *daleel,* a word still used today). Zayd's intense watch for robbers illustrates the guide's principal concern. But he also acted as interpreter and arranged the details of the itinerary, including the length of each day's march and the nightly encampments. It was particularly important to keep the caravan within three or four days' travel of a sizable watering place. During periods of political or military unrest, the guides acted as spies.

Such intimate knowledge of desert landmarks was required that the position of guide took on the status of a highly regarded profession. As soon as he was old enough, the guide's son began making the trip from Mecca with his father as an apprentice so that the information could be passed on directly from generation to generation.

The couriers were called *basheers* when they carried good news, *nadeers* when the news was bad. The *nadeer* raced to the nearest town for aid when the caravan was in danger. He could be recognized from afar by his reversed saddle and torn garments.

The *basheer,* on the other hand, heralded the safe arrival of the caravan in the few towns along the route. Greeting the caravan was a public event which generated holiday excitement as large crowds gathered in the market place.

Many of the camel drivers owned their own camels (like some American truck drivers), and contracted directly with the merchants.

Once beyond the friendly regions surrounding Mecca, the caravan settled into a time-honored routine. The leader and his immediate staff rode ahead of the convoy as a sort of advance guard. A large banner carried in front indicated all was well as long as it remained furled.

After a normal day's journey of 30 to 40 miles, a carefully arranged encampment was made for the night. The camp was grouped in a circle or square around the tents of the leader and his staff. The boxes of merchandise were unloaded and stacked around the edge to make a low wall in case of attack. After supper, the leader held a court session, if necessary, to deal with matters of justice that had arisen during the day. Since the safety of all depended on strict discipline, the orders of the caravan court were carried out with dispatch.

To help insure the safety of the Meccan cargo in each part of the trip, the leader negotiated protection contracts with local Bedouin tribes. Large subsidies were paid for guarantees of immunity from all kinds of disturbance and attack. Not only were transit tolls collected at many points, but the use of a fine well or pasture carried a worthy price.

The nomads, in return, desired to spend part of their income on the caravan's goods. Each year some of the camels were laden in Mecca with goods to be sold along the route. These goods were opened and displayed wherever the caravan stopped to encourage safe and legitimate business with the nomads.

But Zayd's caravan faces armed nomads intent on plundering. How can the three-mile-long convoy defend itself on the open desert?

Zayd's warning to the caravan leader causes immediate mobilization for the pitched battle which is only an hour or two away. The caravan shifts into a close march and increases its normal rate of 2.5 miles per hour in hopes of reaching the oasis before stopping.

When the battle becomes inevitable, the caravan quickly turns itself into a formidable, armed fortress. The camels crouch down behind a stout rampart four to five feet high, formed from the bales of cargo. Not only the armed guards but everyone in the caravan fights valiantly for the common defense. Whatever their individual differences, the men of a desert caravan stand united in a fierce loyalty and brotherhood that is binding unto death. When the attackers are repulsed and sent reeling back into the desert, the caravan marches on.

In time, the skill and swiftness of such guards as Zayd made it extremely unprofitable to attempt any thievery from the annual caravans from Mecca. One can almost visualize the serene yet cautious look on the face of the guide as he rides the crest of a hill overlooking the oasis, satisfied in the knowledge that the men and goods in his care are, at least for the moment, safe to continue their journey to the market place of Damascus. ■

ARABIAN LANDSCAPES

Agriculture and date-growing in the oasis of Qatif, situated on Persian Gulf.

SAUDI ARABIA, lying in the same longitudes as Mexico, has approximately one-quarter the land area as the United States. The distance between Jiddah, on the west coast, and Dhahran, on the east, is equal to that between Chicago and New York. A southeasterly flight from Turaif, near the Jordanian border, to the extreme southerly regions of the Kingdom would take about as long as flying from northern Montana to New Orleans.

ARABIAN LANDSCAPES

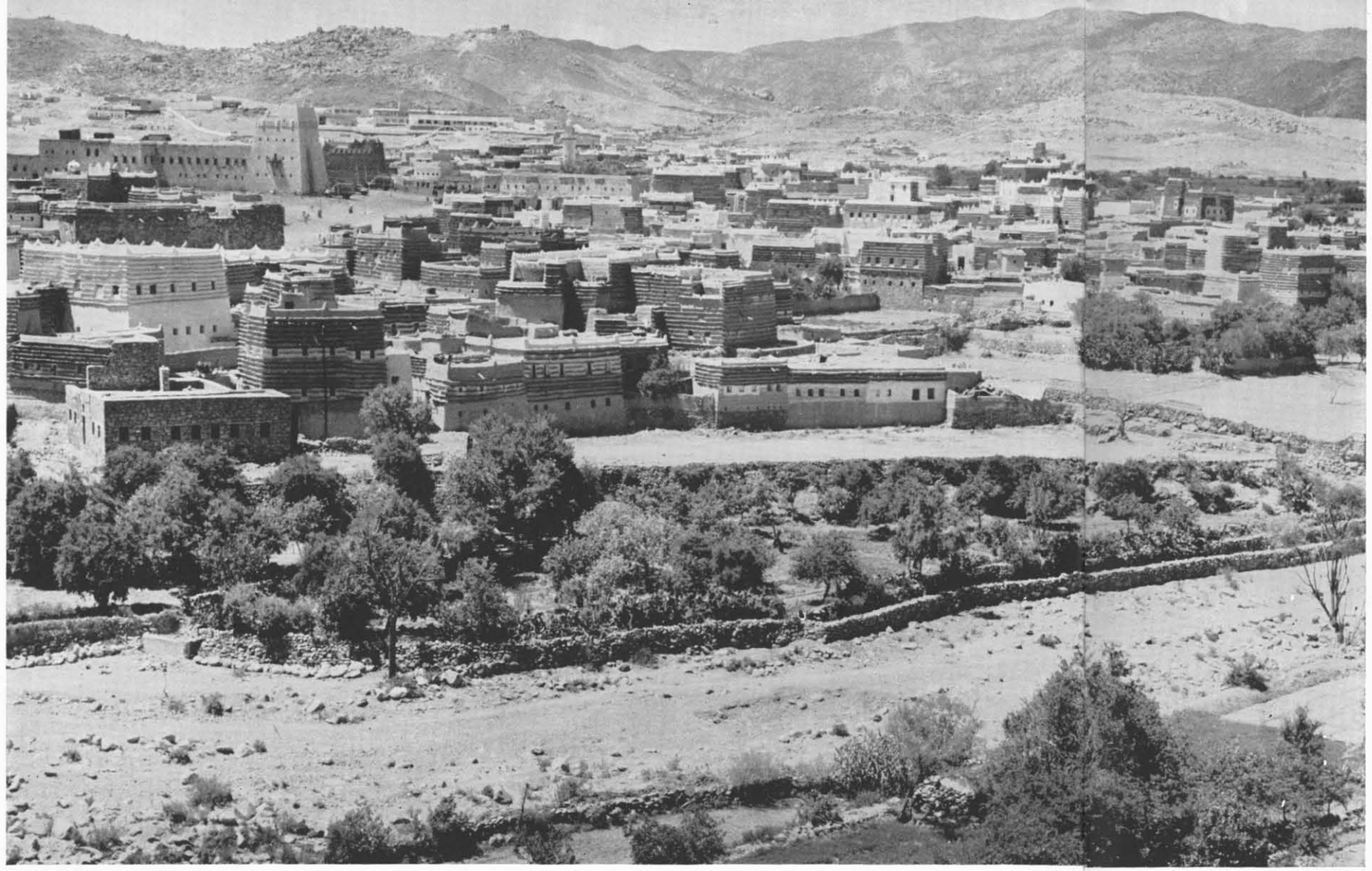
Much of Saudi Arabia's vast expanse, as is well known, consists entirely of desert. But the Kingdom has mountainous portions, too, with peaks rising in its southwesterly corner as high as 10,000 feet. Gravelly plains, completely devoid of sand, cover thousands of square miles in the north. Along the Persian Gulf shore the frequent stretches of salt flats, called *sabkhas,* have mired down many an unwitting driver who imprudently has chosen a short cut off the beaten path.

Take a plane across the breadth of Saudi Arabia and watch countless miles of monotonous, sand-colored geography slide by far below. Suddenly, for no accountable reason, a tiny, irregular splotch of green comes into view: irrigated gardens wrested from parched earth where someone long ago

This clump of bushes waged a hard battle against the harsh environment of the Rub' al-Khali — and lost. Bedouins prize such bushes as firewood.

In 'Asir Province, southwestern Saudi Arabia, farmers maintain terraced slopes in the Tomana Mountains to grow a wide variety of crops.

In Persian Gulf port city of Dammam, an Aramco-built elementary school stands in center of houses purchased by Saudi Aramco employees with the aid of company financing.



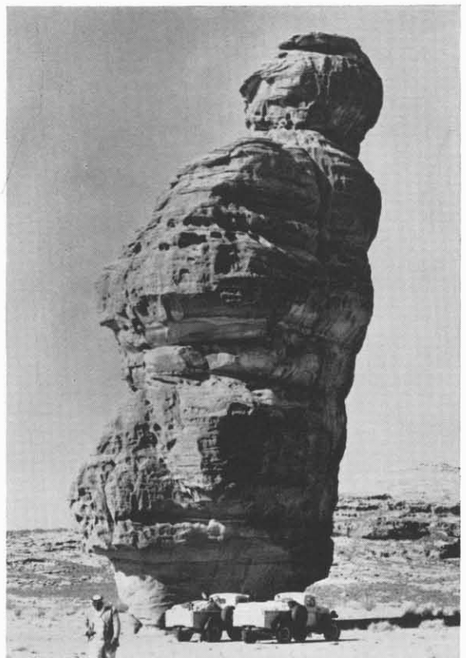
Abha, at 7,300 feet, is Saudi Arabia's highest provincial capital. 'Asir Province, bordering on the Red Sea, is governed from Abha.

ARABIAN LANDSCAPES

dug a water well. Discover villages half hidden in oases which grew into towns as ancient, anachronistic mud-brick walls came down before population pressures and little farming communities burst into surrounding palm groves in all directions.

Through the mist on the horizon looms the outskirts of a city. As the aircraft swoops over it the haze is seen more clearly as dust kicked up by earth-movers changing the city's face—broadening thoroughfares, excavating for apartment houses, digging sluiceways. In the heart of the city, away from the restless traffic and commerce of the newer sections surrounding it, is the traditional Middle Eastern bazaar. Here, in deepest contrast to the quiet desert only a few miles distant, milling throngs trade riyals for hubble-bubbles and dates, bright enamel teapots and strong, exotic spices; flashlights, kerosene stoves and fountain pens.

As these photographs attempt to show, the scenery of Saudi Arabia is as varied as the moods of the desert which dominates its landscape. ■



Travelers through the upper Hijaz in northwestern Saudi Arabia come across erosion remnant which centuries of wind have shaped in a snowman of stone.

By using careful irrigation methods, the farmers who live in Hofuf make this huge oasis complex one of the most productive farming areas in Saudi Arabia.

A new breed of explorers is launching a long-awaited plunge into

Drawing with a pencil on frosted plastic, an underwater "artist" plots position of remains of a Bronze Age ship prior to removing them for study.

The Watery Part of the World

IT WAS an afternoon in 1960. The sun was shining brightly and the draftsman had sat down with pencil in hand to sketch the ruined ship. It lay near Cape Gelidonya, the point on the southwestern coast of Turkey, where it had been damaged and come to rest about 1200 B.C. Its never-delivered Trojan War cargo consisted chiefly of copper ingots and bronze tools — the largest hoard of Bronze Age metal yet uncovered anywhere. Many of the tools were broken and apparently were being carried as scrap metal. With them was a quantity of tin, the earliest-known industrial sample of this metal.

There also had been found shards of crystal, a treasure chest, polished stone mace-heads, baskets, lamps, three sets of apothecary's weights and measures, and some exquisite, jeweled Syrian scarabaeuses.

The ship was a rare prize and photographers were now carefully taking overlapping shots to form a sectional map of the entire site. Some of the University of Pennsylvania archaeologists were on their knees, like gardeners, painstakingly clearing away a growth of seaweed. Not far away, a man assisted by a chisel-holding partner was breaking up a boulder with rhythmic swings of a ten-pound sledge hammer. Some Harvard professors were carefully triangulating positions from stakes driven into the mud. Still other members of the team were examining the section where the crew must have lived. They had uncovered the remains of a meal — olive pits and fish bones.

The draftsman was for the moment absorbed with penciling in the lines of an ancient two-handled oil jar, the kind of job he'd done dozens of times at other excavations and at his museum desk. Today, however, instead of drawing paper he was using sheets of frosted plastic. There was a small aqualung strapped to his back. His left arm was lashed to a rock, to brace him against the current. Finally, a pair of groupers were hanging over his shoulder, as if to check the accuracy of his drawings with their mournful eyes.

The draftsman and his fellows, of course, were working underwater. Before they were done, they would raise over a ton of artifacts in a probe 32 centuries into the past! A few years earlier, it would not have been possible to even contemplate their tremendous undertaking. Now, with specially devised equipment, they were able to use their dry-land learning under a hundred feet of ocean water.

On the other side of the world, simultaneously, a second group of men was exploring the sea off Mexico's Pacific coast. This team, comprised of oceanographers and geologists, had also made a momentous undersea discovery. Through television, they had found immense quantities of valuable ore nodules piled up on the ocean floor. These were growing as crusts around some nucleus, such as a pebble or a shark's tooth. They were mostly iron and manganese oxides, but often a sample would contain staggering amounts of copper, nickel and cobalt. Subsequent prospecting led the men to suspect that at least a ten million-square-mile area of Pacific floor must be filled with these nodules. The value of ore was estimated at hundreds of thousands of dollars per square mile!

For centuries, man knew less about the sea bottom than he did about the near side of the moon. He believed the ocean floor was mostly a level, featureless plain. Recent improved observational techniques and stepped-up exploration have drastically changed this picture.

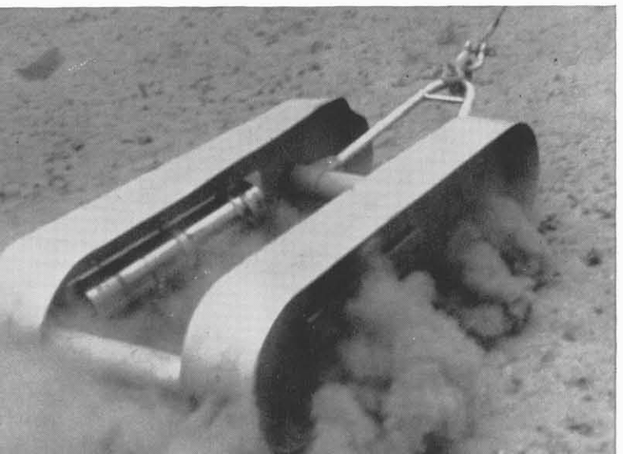
In the past few years, he has come to realize the two-thirds of the earth's surface which is under water contains its most striking formations. The underside of the sea has canyons, trenches, hills, valleys and plains. Under the Pacific lie ridges of mountains higher than Everest, trenches seven times as deep as the Grand Canyon, over 10,000 active and inactive volcanoes. Deep beneath the Atlantic are rivers with cutting power hundreds of times as great as the swiftest streams on land.

These and other facts have been obtained with the help of wonderful new equipment. Oceanographers now have at their disposal bathyscapes capable of being lowered for miles, two-man submarines, special thermometers which enable predictions of the size, speed and direction of currents, and literally scores of electronic aids.

There's no doubt that the ocean experts are in a decade

The Watery Part of the World

Sea-bottom corer, plunging to ocean floor as scuba diver aids its descent, extracts five-foot-long core of bottom. Cores are then analyzed in laboratories in connection with undersea mining surveys, tests for underwater construction, and geological and biological examinations. An underwater sled (below) helps map sea floor contours. On sled are a depth sensor and an inclinometer. Information is sent by communication-towing cable to recording instruments aboard the ship which tows the stainless steel sled.



of startling discovery. And perhaps the happiest discovery of all is that they're not in it alone. The current rush to explore the sea is being shared not only by archaeologists and geologists, but by chemists, physicists, engineers, agriculture experts, sportsmen, even municipal planners.

These non-oceanographers often "pay their own way" underwater by inventing or adapting their own equipment. It was the sportsman, for example, who developed the familiar self-contained diving lungs. Archaeologists have invented several brand-new methods of lifting matter from sea bottom to surface. The petroleum engineer devised his off-shore oil drilling techniques as he needed them, many of which are now being used by strictly oceanographic scientists. The petroleum geologist successfully adapted the dry-land practice of seismic oil prospecting for use underwater.

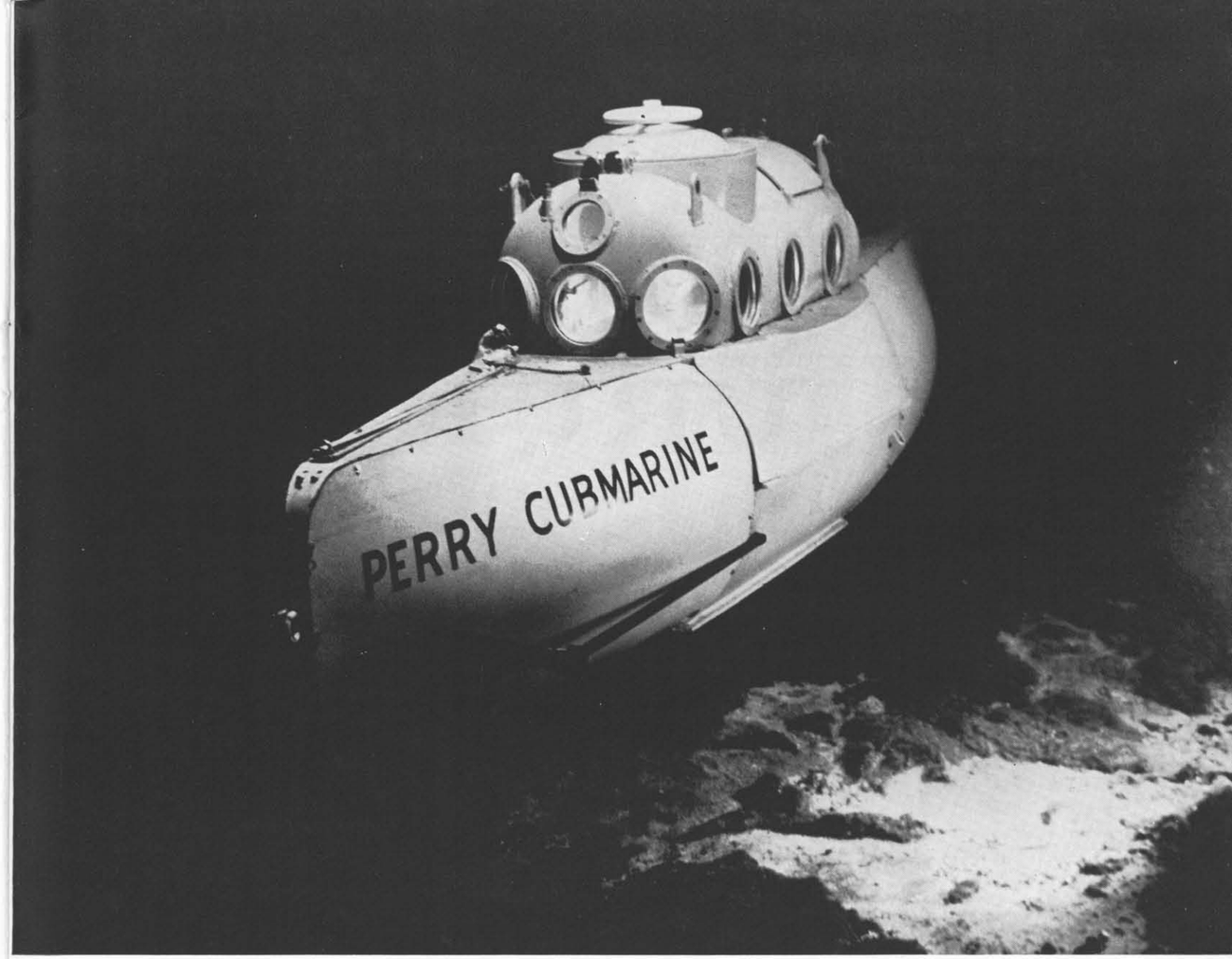
During World War II, aviation engineer Edwin Link invented and built the "Link Trainer," a stationary pilot-training device. More recently, the Texan has been inventing useful items for his favorite hobby, submarine archaeology. Chief among Link's new inventions is a kind of underwater vacuum cleaner he calls the "Airlift." The lift is an air-operated dredge with a sucking action capable of rapidly transporting water, sand and rocks the size of a soccer ball up from the bottom. In appearance, it consists of a 14-inch pipe, buoyed at the surface and lowered to the sea floor. There, divers move it about like a vacuum cleaner and vary the flow of compressed air injected near its base. This makes the air rush upward, creating a sucking action.

Using the Airlift in 1961 in Middle East waters, Link brought up historically valuable amphorae, ancient weapons and tools, gold, jewelry, and hundreds of Roman and Arabic coins. Recently, the Mexican government used the Airlift to recover over 4,000 gems and artifacts from a 180-foot-wide inland sinkhole. A thousand years ago, Maya priests used the hole as a "Well of Sacrifice."

Link's most spectacular success, however, was at Port Royal, the Jamaican buccaneer capital which disappeared into the sea during an earthquake and tidal wave in 1692. For almost 270 years, the city lay totally lost in mud and murky waters. Like others before him, Link failed in several attempts to locate it. Finally, in 1959, with a specially-built boat, he and other divers uncovered and explored a submerged fort, a kitchen, and the shop of a Port Royal merchant. Among the hundreds of items raised were clay tobacco pipes, cannons, jars of olives intact with pitch seals still in place, and an elegant brass pocket watch. The mud had preserved the items well, including the watch, the hands of which were stopped at 17 minutes before noon, almost the exact moment of the earthquake.

At present, new underwater archaeological excavations are underway in Finnish and Egyptian waters. The latter expedition, directed by Egyptian skindiver, Kamel Saadat, will attempt to raise marble sarcophagi, statues and other antiquities from the ruins of the Alexandria Lighthouse, one of the Seven Wonders of the ancient world.

This past summer, French oceanographers spent two months studying the Red Sea bed to depths of 6,500 feet.



Newly developed Cubmarine, 20 feet long, has two-man crew for exploration, physical-biological studies, salvage, and underwater inspections.

Their quest made headlines because they worked out of a submarine "village" of three houses built for them and their equipment. In California, a town council is currently experimenting to find out what kind of housing *fish* prefer. It is known that fish won't linger in areas where the ocean bottom is flat and uneventful. On the other hand, nothing will attract them as much as shipwrecks. These provide a foothold for kelp and other plant life which fish eat. The community of Redondo Beach is attempting to bring sport fish to its presently barren offshore by dumping discarded streetcars and old auto bodies in the water. They hope these will offer through their nooks and crannies safe, food-laden refuges for gamefish.

UNESCO, in the face of an anticipated world food shortage, is also studying fish and marine plant life. The scientific standard of presentday fishing, say UNESCO oceanographers, is roughly equivalent to the level of agriculture in the year 1700. In the future, they predict, fish crops will have to be cultivated. Edible species will be protected against enemies (as plants are now from insects), and parts of the seas will be fertilized to increase yields. They envision future frogmen farmers working tractor-trawls sent down from parent ships above. They will cultivate, fertilize and even weed (by pulling devices over the sea floor to weed out creatures that take food from more valuable fish). Nuclear reactors may also be placed on the ocean bottom of "desert areas," to warm up the water, which would then rise and carry nutrients with it to the surface, creating a fertile area for plant life and, eventually, fish.

The sea floor *can* supply man with such staples as food, fuel, medicine and industrial raw material. It can also furnish missing pieces to the jigsaw puzzle of the earth's past, present and future. Its fabulous supplies and secrets are there for the taking. And man is beginning to do just that. ■

BANKER OF URUK

A career in banking held some familiar risks thirty-six centuries ago in the Middle East

An early banker (Phoenician) explains his services to a boatman while a scribe records the transaction on a clay tablet.

THAT WEEK, in the early spring of the year 1700 B.C., more than his fair share of business headaches came to Shamash, the most prominent banker in the city of Uruk, some 50 miles directly north of Ur in the heartland of the ancient Middle East.

One of his clerks, Balu, a young and distant relative, came to Shamash and gave him bad news of a shipment of copper ingots newly arrived from Oman on the shores of the Arabian Sea.

"The quality is much below normal, sir," said Balu. "Here is the report of the analyst of Qurna." He handed his employer a clay tablet and pointed his finger halfway down its surface. "It says here that the ingots are porous and worth much less than they should be. The analysis states, however, that the black stone in the shipment is good."

Shamash sighed and bade the clerk press a copy of the report in wet clay. For a few years he had financed merchants so that they could buy goods of many kinds from the exchange port of Bahrdin in the Persian Gulf, taking for himself only the interest derived from such loans. But within the past couple of years he had speculated by buying portions of shipments for resale himself.

There was a variety of fine goods in which to speculate. On the southward run there were Mesopotamian textiles, including beautifully-dyed woolen materials, leather goods, wheat, olive oil, colored glass of many kinds, and other articles of much value; on the return run north there were gold from India and Africa, silver, copper, rare woods, great pearls and other precious stones, and lately there had been a great increase in the trade in preserved fish, in meats and in cheeses.

Oh, yes, there was opportunity to get rich – but there was also opportunity to lose everything he had built up in his banking business. The average merchant who dealt in the gulf trade accompanied the ships he chartered so that he, personally, could supervise the quality of what he bought.

Shamash could not do this yet, for not one of his clerks was sufficiently learned in the complicated practices of banking to take over running the bank if Shamash took a trip to Bahrdin.

He could not blame them, for it took years to learn the business. Among the many duties were recording bills of exchange, advancing mortgages, making of wills on request, leasing lands and selling or buying farms for clients, the lending of precious metals and stocks of varied goods, the hiring out of slaves; there were matters like advancing values to farmers to repair the dykes and canals that watered and drained their lands, renting grazing areas, keeping clay copies of a hundred different contracts, supervising payments to sharp commission men, receiving and interpreting reports on weather forecasts for the gulf so that shipping might be undertaken in safety. There were many activities, not the least profitable of which was the receipt from depositors of gold, silver, precious stones and other valuables for storage and safekeeping in the temples.

And, of course, there was no substitute for years of personal experience which enabled one to accurately judge a man's character in the important matter of lending.

Shamash would have to set aside his ambition to enlarge his merchandising activities for a while. And, indeed, the following day, more upsetting news came to him concerning the trading on the great sealanes – the profession of piracy was on the increase.

With a rise in the quantity of gold and in the amounts of other goods traveling in sea-going vessels, including foodstuffs, the pirates who had infested the gulf for ages were not only growing greatly in numbers, but were becoming bolder. Already prices were rising and insurances rates were lifting steeply.

It was the general custom at that time, as it was to be in the twentieth century, for traders to use the capital of others rather than their own for ventures out of the usual. In the matter of ship chartering, a number of Mesopotamian gentlemen would get together, borrow from Shamash enough to charter a ship, provision it, and load her with trade goods. The owner of the vessel, insisting on insurance coverage for his ship, would be given the bank's guarantee that the charterers, if the ship were lost as a result of weather or pirate attack, would reimburse the owner to the full cost of the vessel out of their own personal resources. And with this news of greater pirate threat, the insurance guarantee was expanded to cover a margin of value in excess of the original cost of the ship.

The remainder of that day was spent by Shamash in supervising the drawing up of a number of wills. These were to be recorded on clay at the behest of certain prominent families of not only Uruk, but of families of importance who lived as far south as Qurna at the confluence of the two great rivers, and as far north as Borsippa, which was only a few miles from the fabulous Babylon itself.

Shamash was not a proud man, but he quietly derived much satisfaction in the knowledge that a large part of his banking business grew from his wide reputation as a fair man, a just man. Once Shamash agreed to look after a client's interests, be he shipowner, absentee landlord, trader on the far camel caravans, general merchant, or dealer in rubies and pearls, he could be relied upon to charge only the rate of interest or the fee or the agent-margin allowed by the Laws of Hammurabi.

Not a barley-grain of silver extra would he charge.

As a fellow-banker of the same town would say at social gatherings, "Shamash may not be too successful as a banker, but he is highly successful as a man. As a banker, he could be one of the richest men in all Mesopotamia, but his heart is too soft. For all I know, he might be amassing a kind of wealth that a man does not weigh on the balance."

There was plenty of evidence for this observation.

Just three months before, when the day was cool upon the skin, the father of the girl Tamystha, one Biktar, came to Shamash and said, "My daughter is now of more than marriageable age. As you know, Shamash, we are of good family but somewhat impoverished. Now, there is a rich businessman from Persia, a dealer in the fine rugs and he is now in our town to see about ways of expanding his trade—"