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No. 12

ARID LANDS NEWSLETTER

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COVER:

Center pivot irrigation systems form bizarre patterns at the Al Kufrah Oasis, southern Libya. Scale approximately 1:1,140,000. This scene is a Landsat "false-color composite" created from multispectral scanner (MSS) digital data by assigning the colors yellow, magenta, and cyan to bands 4 (green), 5 (red), and 7 (optical infrared) respectively, at brightness values corresponding to the ground-reflected intensity. Bright red values result in this subtractive color combination, from high values of infrared reflectance, indicative of vigorous vegetation, in arid areas such as this usually irrigated.

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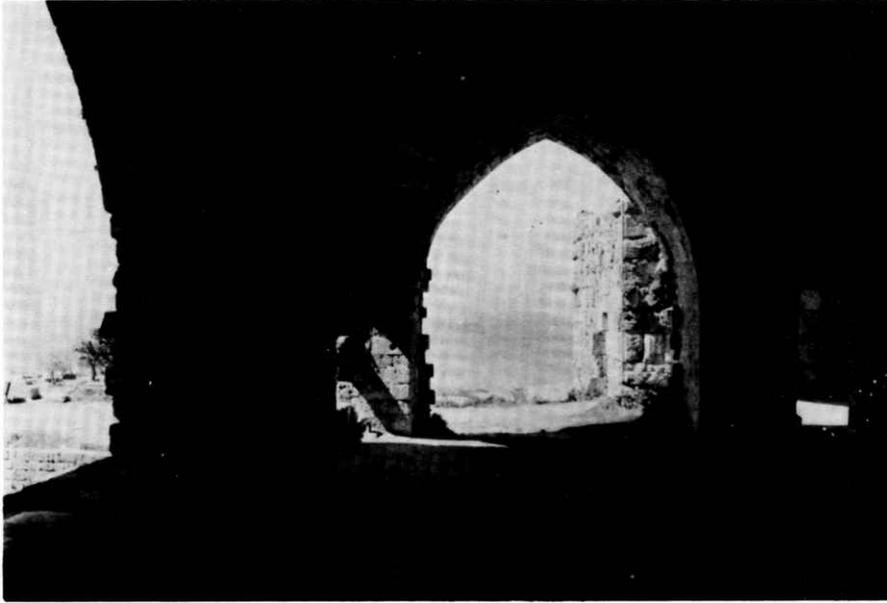
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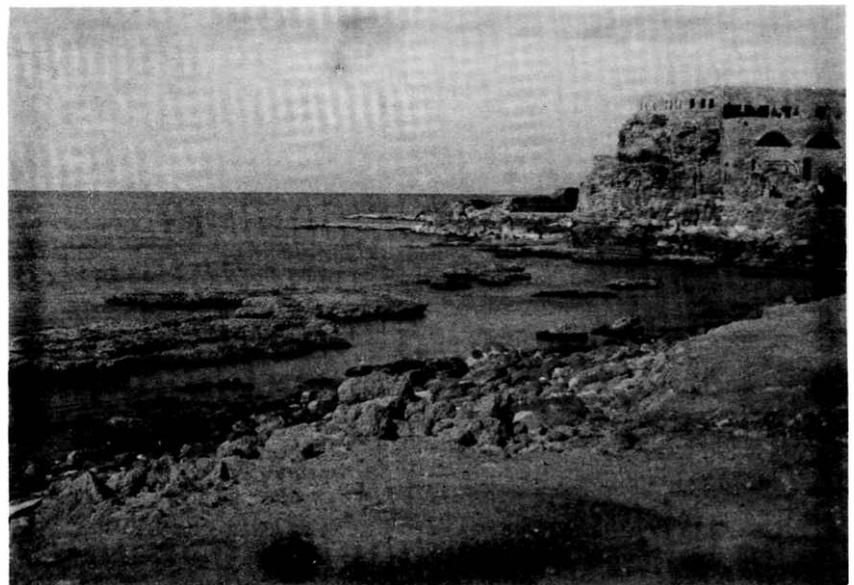
Byblos (Jubeil/Jubayl), north of Beirut, where Egyptian vessels traded from the dawn of history, was the port from which the noted cedars of Lebanon were shipped.

—photo by J.D. Johnson

The beauty and mystery of these two ruins on the coast of the Eastern Mediterranean still haunt the knowledgeable traveler, exemplifying as they do the eternal persistence of ancient monuments.

Caesarea, this magnificent Roman ruin originally built by Herod at the site of an ancient seaport south of Haifa, was the headquarters of Pontius Pilate and the place where for two years St. Paul was imprisoned.

—photo by Patricia Paylore



THE REST OF THE WORLD RIGHT NEXT DOOR

Timothy Light*



Timothy Light

60 percent of all the Earth's people. There are over 30 separate countries in that territory, including the world's largest democracy, India; the world's most populous country, China; and the world's leading industrial innovator, Japan.

That piece of territory includes the homelands of all the world's universal or major religions. Faiths not nurtured and developed in what we usually consider the Orient are either sectarian expressions of those major religions, or are descendants of very early localized religions identified with particular ethnic groups.

It remains for others to investigate the relationship between these aspects of our "orient" as we shall discuss it here, and aridity. Yet this environment factor is ever present in our consideration of the area as a whole. [Perhaps *Arid Lands Newsletter's* Editor will assign this to one of her readers some of these days.]

That piece of territory has also spawned at least three major civilizations of greater duration than the culture of Europe and of immeasurably greater duration than Europe's last offshoot in North America: those of the Middle East, South Asia (India-Pakistan), and East Asia. Yet even to identify each of those areas as a single civilization does injustice to the variety and creativity that obtains in each. To say that the Middle East has one

civilization, for instance, is like saying that the Americas are one culture, a notion that is clearly untenable.

That largely arid territory between Europe and Japan also includes all of the areas central to U.S. foreign policy for the past 30 years, except for our mainline ancestral area in relatively small Western Europe. For purposes of trade, for supplies of petroleum on which we presently depend, for our political aims, for our national security and that of our allies, the part of the world between Europe and Japan is of prime importance to us.

It is, nevertheless, also the area of the world we know least about — we meaning the collective American people and not excluding our leaders and policy makers. Our foreign policy reversals, those disasters making up so much of the rhetoric of the current election year, are at bottom intellectual failures, examples of our national devotion to ignorance of this most complex, most populous, most important piece of Earth.

America's lack of a broadly-educated populace presents a far more dangerous situation in the field of foreign languages and international studies than it does, for example, in mathematics and science — current, even fashionable, mythology to the contrary notwithstanding. Our training and support of scientific and technical specialists has been greater by many orders of magnitude than of non-English/American (especially non-western) human studies of all sorts, and our economy makes greater use of the most highly-trained specialists in these technical subjects than it does of those in human subjects. Certainly a crucial national goal of international studies, supportive of the needs of diplomacy, intelligence, and business should be the development of a large population of educated and knowledgeable citizens, internationally aware and linguistically trained. It is not sufficient that our foreign service hire officers according to criteria of which language and areal speciality are only two. It is only when the population as a whole is more broadly educated that the needs of government and business will more likely be met through opportunities to draw on a sufficient pool of relevantly-trained people.

* Chairman, Department of East Asian Languages and Literature, Ohio State University, Columbus. Dr. Light (Ph.D., Cornell, 1974) is a former Associate Professor of Oriental Studies, University of Arizona. A specialist in Chinese language and linguistics, he is consultant to numerous groups concerned with the opening up of the PRC and the need for us to have a deeper understanding of its culture, geography, language, and history.

A view of a portion of one of Iran's great eastern deserts, the Dasht-i-Kavir, which might as readily be mistaken for California's great Yuma dunes or the PRC's Shapotou dunes near Chung-wei.

—photo by J.D. Johnson



“Appropriate technology” at work on a personal scale, Tehran.

—photo by Helen Kassander

. . . a crucial national goal of international studies, supportive of the needs of diplomacy, intelligence, and business, should be the development of a large population of educated and knowledgeable citizens, internationally aware and linguistically trained.

Report of Presidential Commission, November 1979*

A formal review of our present situation with respect to this matter of international expertise was undertaken recently by a Presidential Commission. Some of its findings reveal that:

- only 15 percent of American high school students now study a foreign language, down from 24 percent in 1965, with the decline continuing.
- only one of 20 public high school students studies French, German, or Russian beyond the second year (four years is considered a minimum prerequisite for usable language competence).
- only eight percent of American colleges and universities now require a foreign language for admission, compared to 34 percent in 1966.
- the foreign affairs agencies of the U.S. Government are deeply concerned that declining foreign language enrollments in our schools and colleges will lower the quality of new recruits for their services and increase language training costs, already at a level of \$100 million in 1978.

The Commission does more than just castigate us for our failures, however; in a more positive vein it gives a list of dramatic and encouraging improvements that must be made in our educational system for us to flourish as a democracy. The reinstatement of foreign language requirements for entrance to and graduation from universities is strongly urged. Requiring future teachers to take some international studies is another strong recommendation, for knowledge (as well as ignorance) can be passed on through formal and informal channels. The Commission also recommends establishment of foreign language centers around the country, along with special foreign language and international studies high schools, and it urges that two or three courses in international studies be required of all graduates from college and university.

In short, the President's Commission asks that our educational system open itself up to the rest of the world and prepare our young people for what is there. It suggests that our very survival as a democratic nation in these last years of the twentieth century may depend on doing just that.



Modern version of the world's oldest continuously inhabited city, Damascus (Dimashq), created on a foundation in existence since 2000 B.C.

—photo by J.D. Johnson

* U.S. President's Commission on Foreign Language and International Studies (1979) *Strength through Wisdom: A Critique of U.S. Capability*. Report to the President. 39 p.

A Watershed for American Education?

It is to be hoped that this report and the concern it has generated in government and business will become a watershed for American education:

- that five or ten years from now, no new bachelor's degree holder in any subject will not have had solid training in at least the fundamentals of the geography, cultures, politics, and economics of most of the world.
- that in five years no business school of any repute will produce graduates innocent of the economies of our competitors abroad.
- that in five or ten years no college of education will permit certification of teachers who know no foreign language and little about the globe and its diverse inhabitants.

Americans' shortcomings in foreign languages also may help explain our dangerously inadequate understanding of world affairs. Our schools graduate a large majority of students whose knowledge and vision stops at the American shoreline, whose approach to international affairs is provincial, and whose heads have been filled with astonishing misinformation. In a recently-published study of schoolchildren knowledge and perceptions of other nations and peoples, over 40 percent of 12th graders could not locate Egypt correctly, while over 20 percent were equally ignorant of the whereabouts of France or China. At the college level, an American Council on Education study reported that at most only five percent of prospective teachers take any course relating to international affairs or foreign peoples and cultures as part of their professional preparation. A 1977 Gallup Poll furthermore showed that those who graduate from an educational system so glaringly deficient in this vital area carry their ignorance with them into their adult lives.

The World Outside and All Around Us

In America we have a misleading cliché, "The world is getting smaller every day." By getting smaller, I suppose we mean that jet travel and the instant media give us more information and more access to strange places than ever before. The streets of Tehran, the foothills of Afghanistan, the Sinai wilderness, ultramodern universities rising from Arabian sands — these are familiar scenes invading our living rooms, but most of our grandparents or great-grandparents seldom if ever went further than a day's journey by horse from their homes. Newspapers and magazines they read treated the world outside their immediate ken as exotic, if they mentioned it at all. To the average New Yorker a hundred years ago, even Arizona was a mysterious place. China, Africa, Persia, India were, except to a very adventurous few, remote as though on another planet — certainly less familiar than landscapes on those other planets are to us in this interstellar age!



Early morning on bedouin market day, Beer-Sheva, Israel.

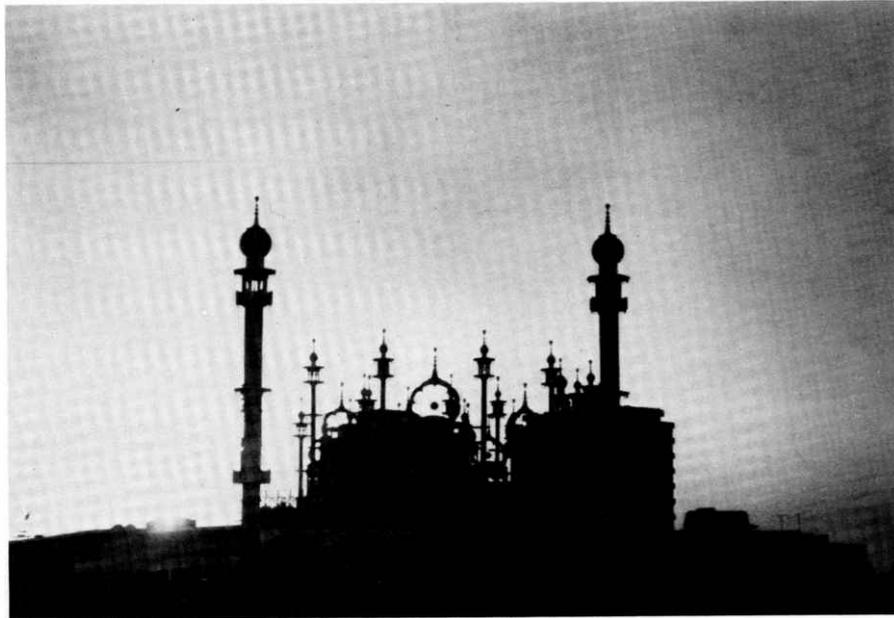
—photo by Patricia Paylore

Modern Cairo (El Qahira), population five million — a view which might as easily be of Los Angeles, air pollution and all — furnishes a startling contrast with the more primitive countryside (below), characteristic of much of the population outside the urban area.

—photo by J.D. Johnson



—photo by Helen Kassander



—photo by J.D. Johnson

Arabian Gulf area showing contrasts within a very small country, Abu Dhabi.



—photo by Helen Kassander

Our material and technical advances have changed that. We can reach almost any spot on Earth in 24 hours. Even if we are not mobile, our newspapers and magazines are filled with rather detailed happenings in places that most of us over 30 were never told existed during our schooldays. If we do travel, we find familiar Hilton Hotels and Holiday Inns and stores filled with American goods in most of the places we visit, and we find that people we meet greet us in English and do not require our learning their tongues as our adventurous ancestors would have had to do if they wanted to go with risk and effort to those places we now can reach with such ease.

So, you are asking, why should we need to study foreign languages?

While the world appears to be achieving uniformity—one familiar to us, we should not mistake familiarity for the mirage it actually is, that illusion that is the source of so many of our troubles. The ease with which we view

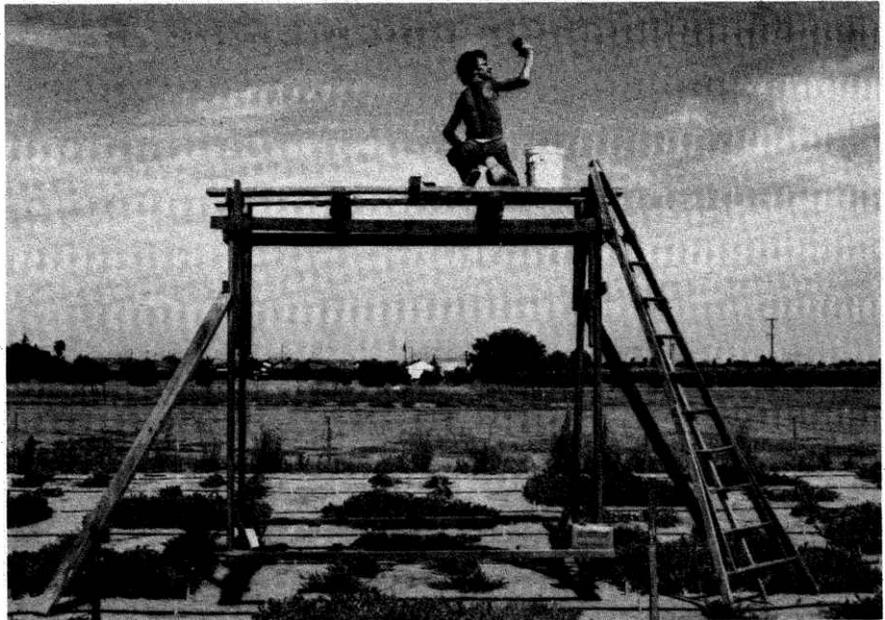
this strange world from our television screens, or the comfort of the jet from which we alight in Cairo or Baghdad or Karachi, should not delude us into believing that seeing, in such a superficial way, is believing that this is all we need to know. It is incumbent upon us to acknowledge that a rapidly-changing world outside our borders is an extremely varied and complex one, not very much like us (nor like the Soviets, either, for that matter), but rather one reflecting an entire spectrum of variety in religion, politics, economics, morals, cultures, enjoyments, a world awakening to its latent power and determined not to be submerged in the gray anonymity of uniformity. Those of us teaching in the field of oriental studies attempt to convey this fundamental fact, that the rest of the world really is right next door, and that, as difficult as it may be, we must learn about that world to function in a milieu where neighbors we must count on do not necessarily share our views on much of anything. Except perhaps:

. . . the rest of the world really is right next door, and . . . we must learn about that world to function in a milieu where neighbors we must count on do not necessarily share our views on much of anything.

It is largely an arid world. The dramatic mapping by UNESCO of the world distribution of arid regions (1977) reveals this as a striking band that includes most of what we have defined as "orient" from 20° E to 120° E, from 10° N to 50° N. If we extrapolate this environment to include the north and south American deserts as well as Australia, we have an excellent basis for environmental understanding at least, among these varied desert dwellers. Here perhaps, as in no other setting, can the scientists among us make neighbors of us all, as Egyptians, Israelis, Indians, Pakistani, Chinese, and the entire Arab world, tackle the problems of aridity they all have in common. As we undertake these studies of mutual issues of lack of water, desertification, diminishing food production, and other manifestations of the arid world's contemporary dilemmas, it is vital that all parties understand each other, an understanding arrived at through education, language facility, awareness of other cultures, traditions, and historic happenings that shape and color our responses to each other.

Let it not be said that another Presidential Commission can fault us here in America in 1990 for our ignorance of the "outside" world, one that we know is indeed "right next door."

Ghiblawi on movable scaffold at the Fresno experimental plot. Here he is measuring wind speed, but plant and soil temperature data by means of infrared thermometer can also be obtained in this way.



This forest nursery near Tripoli supplies seedlings of such species as casuarina, eucalyptus, acacia, and Italian cypress for various government projects as well as windbreaks for individual farms and pastures. Species are selected that require only limited irrigation until established.

FOREIGN STUDENT PROFILES

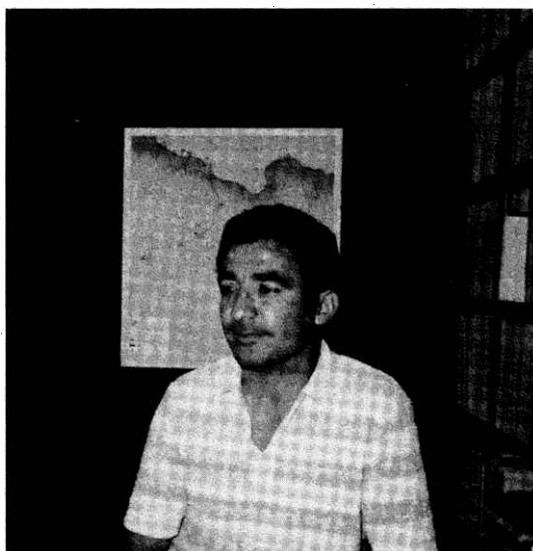
VIII: Amer S. Ghiblawi

One more facet in our continuing saga of University of Arizona students from the world's arid lands is brightly displayed in the person of Amer S. Ghiblawi, a doctoral candidate in plant sciences from Tripoli, capital city of the Socialist People's Libyan Arab Jamahiriya, where he earned the B.S. degree in horticulture from Alfateh University in 1974.

While most of us, especially arid lands specialists, tend to think of Libya only as one of the Sahara's great desert countries, we overlook, perhaps, the fact that there is also more than 2,000 km of Mediterranean shoreline characterized by what we call Mediterranean climate where some of the country's agricultural regions are located, others being in areas at southern oases where irrigated farming is practiced, including the Kufra project.

Ghiblawi helped me with my "homework" on his country over a period of several interviews, describing the other climatic belts of highlands and subdeserts. Libya's nearly 1,800,000 sq km total size is comparable to that of France, Spain, Italy, and West Germany combined, or one-fourth the size of the conterminous United States. While there are no perennial running streams in the country, only intermittent wadis, the discovery of large underground lakes of fresh water in the southern desert areas has permitted development of many agricultural projects to help overcome dependence on food imports, projects that include construction of small dams to prevent flooding during occasional rainstorms and to channel water to natural underground reservoirs, grading and terracing land for farming, construction of irrigation ditches, and other developments intended to help individual farmers.

Nevertheless, there is in Libya a population increasingly urbanized, a trend Libya shares with every Third World country on Earth, as rural people move to the cities to find fulfillment of what we call "rising expectations" for a greater share of "the good life." In Libya these in-country migrants seek work in the oil fields, along the littoral, at the great ports of Tripoli, Benghazi, Sirte, and others. The resettlement of nomads is also actually an official Government policy.



Amer Ghiblawi

To offset this demographic shift, the Government presses on with the need for land reclamation, electrification of villages, and reforestation programs. In the northeast corner of the country, for instance, there are low dense forest areas of juniper, Ghiblawi told me, much to my surprise, with good ground cover of annuals such as brome, rye, canary, and bluegrass.

Which led us to a discussion of his academic work since coming to the United States in 1975, first to Portland, Oregon, later to Fresno, California, where he received the M.S. degree in Agriculture/Horticulture from California State University in the summer of 1978. In the nearly two years since then, his studies at the University of Arizona have extended his work on "The Effect of Water Stress on Establishment of Selected Ground Covers," the title of his thesis at Fresno. That thesis, itself, is an impressive example of Ghiblawi's wide-ranging intellectual interests and capacities, with the extensive computerized data

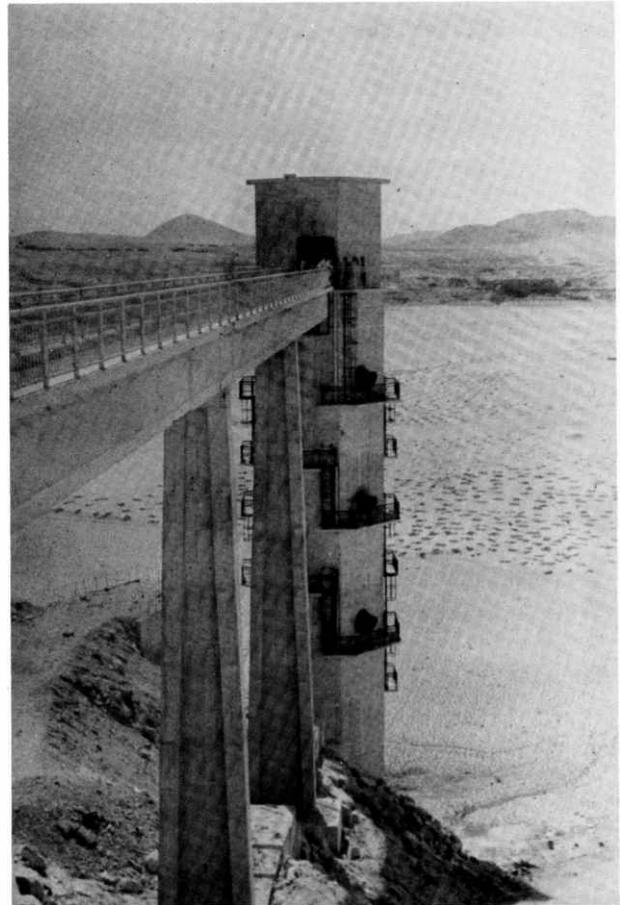
analyses of the four plants chosen to evaluate the effects of increasing soil moisture stress on various aspects of growth of such ground covers as ice plant, African daisy, English ivy, and prostrate juniper. He is also an accomplished photographer, and we spent several instructive hours viewing his hundreds of slides that demonstrated the field work done, as well as the extensive laboratory work to legitimize his findings.

What does the future hold for a man like Ghiblawi, a typical modern Libyan, educated in the broad sense as well as the narrow specialized sense, at home in the late twentieth century, sophisticated, personable, aware? He looks forward to "going home," for one thing, to put his knowledge and technology to work for his country, to rejoining family and friends, to take part in a new world where technical man must make his peace with the environment. He points out that his studies of drought-resistance of plants and selection of species to protect soil against erosion as well as for forage are aspects of concern throughout the arid world. If he can contribute to solutions to some of these problems, now nearly epidemic, he will feel that it has been worthwhile — the long years of separation from country and family, as well as the dedicated years of study.

So for all his skills at the manipulation of electron microscopes, the morphological adaptation of plants to environmental conditions, the know-how to measure field results and extend those measurements to theoretical variables, Ghiblawi is a very human sensitive person who sees no reason not to be concerned with aesthetic aspects of ornamental plantings as well as for the more basic considerations of food and forage.

"May I come and visit you sometime, to see how you have put your education to work?" I asked him as we parted for the summer. The warm smile bestowed upon me assured that I might, so that for my own personal satisfaction I could see Libya for myself, instead of vague photographic recollections from the desert campaigns of World War II, or that old John Wayne movie where he and Sophia Loren survived the rigors of Libya's southern desert — really! So I look forward to seeing Amer Ghiblawi standing there on the tarmac to welcome me when I alight.

—Patricia Paylore



This pumping tower (photo taken during construction) now provides water from the adjacent reservoir for a nearby agricultural project southeast of Tripoli. Source of reservoir water is runoff into the Wadi Majinin which formerly caused damaging flash floods at times as far as Tripoli.

editorially speaking:

WILL WONDERS NEVER CEASE?

Meeting in Rome in early September of this year, the United Nations Fund for Population Activities concluded its conference on urban problems in developing countries by predicting that 650 million people will live in so-called supercities of more than five million each by the year 2000, an increase since the 15 percent of the world population living in such urban areas in 1950, to 40 percent of the world total.

This grim and relentless process of population growth cuts across all the basic needs of mankind and, perhaps more than any other single factor, frustrates man's achievement of his higher needs. Certainly the solution — or the answer, if you will — to this one problem will mitigate the others that plague us: malnourishment (or, less euphoniously, starvation), disease, poor (or no?) housing, congestion, unemployment, inflation, rocketing costs for food, fuel, fertilizer, all of which are simply compounded by too many of us. For past population growth has built into future growth a momentum beyond our recall.

But never mind.

The nuclear age is growing up to adolescence and beyond, and earlier generations who resorted to plain old-fashioned war where we bayoneted our adversaries personally, or sent artillery shells into the enemy's trenches just across the open space between us, or even the quite primitive method of dropping an atom bomb from an airplane, for heaven's sake, are gone, no matter how much we may mourn for those sons and fathers and friends who took part in such anachronistic warfare. No, this is much better: cleaner, quicker, more impersonal.

And so we have conceived the ultimate weapon to defuse and control that long-time-in-the-making population bomb that has troubled, in an abstract sense, agencies like FAO, the World Bank, WHO, Worldwatch, UNEP, and others. We are all working very hard on it, the USSR, the USA, the French, British, Brazilians, Israelis, Indians, Iraqis, Pakistanis, Chinese, and who knows who else? One World, indeed. Who would have thought a generation ago when the United Nations was first created that in such a short time span — geologic time, that is — we could have molded Earth into such a delicate composite, have become so universally dedicated to a common goal, have all been willing to invest so much of our capital and resources to attain this means, have set aside our racial, religious, economic, political, and geographic differences by joining together in this universal objective of instant deserts?

As a long-time specialist in arid lands studies, we are pleased personally to note that so many of the countries in the forefront of these developments are desert countries. Even France and England, while having no arid areas in their geographic outlines, do have a long history of colonial involvement in the deserts of Africa and the Middle East. And while Brazil has only a small area in its northeast that can be characterized as arid or semiarid, it is heartening to us to know that they too are cooperating in this new age.

While many of the countries of the Middle East, being largely desertic already, have little to gain personally in the sense of enlarging their deserts' extent, we must credit them with a willingness to help the nondesert areas of Earth to share in the bounty of life in the classic arid environment that has been their historic inheritance. As for the People's Republic of China, it is good that the "opening up" of that vast country enables us to welcome them into this new world community, even though, so far as we know, none of us has yet visited Lop Nor.

So it is consoling for all of us who were born in, grew up in, and who loved our desert homes, to know that we shall not be alone in future, confined to that mere 35 percent of Earth the statisticians have designated as ours, but shall be able to extend that percentage to the coming billions. Why should we not unselfishly share with others those clear skies, that little rainfall, that scanty vegetation, those bright night stars, and ah, those great open spaces that we cherish. The fact that so many millions emigrating (for one reason or another, but let's not go into that here) to desert areas of Earth are already making them more crowded than those of us natives would like is a troubling one. But now that we have the means to create new deserts instantly, without waiting for the relatively slow process of desertification, that overcrowding that distresses us so much will be taken care of — quickly, silently, cleanly, and yes, expensively. But then, whoever said the good life would be free? So all you in those supercities the UN frets so about, not to worry about the twenty-first century. You won't have to wait that long until you join us here in our dry, sunny open spaces and not be concerned about water, electricity, superhighways, shantytowns, ice storms, gasoline, or politics.

With all the traditional hospitality of desert life immemorially, we say **WELCOME!**

—*Patricia Paylore*

Table I. Population Data for Selected Arid Countries*

Country	Birth rate (annual per 1,000 pop.)	Death rate (annual per 1,000 pop.)	No. yrs. to double population	Infant mortality rate	% pop. under age 15	Life expectancy at birth	Per capita GNP (US\$)	Pop. est. mid-'80 (millions)	Pop. projected for yr. 2000 (millions)
AFGHANISTAN	48	21	26	226	45	37	240	15.9	26.4
ALGERIA	48	13	20	142	47	56	1,260	19	36.9
ARGENTINA	26	9	43	45	28	69	1,910	27.1	32.9
AUSTRALIA	16	8	86	12	27	73	7,920	14.6	17.9
BOTSWANA	51	17	21	97	50	56	620	.8	1.4
CHAD	44	21	30	165	42	44	140	4.5	7.4
CHILE	21	7	48	40	35	66	1,410	11.3	15.2
EGYPT	38	10	26	90	40	55	400	42.1	64.9
ETHIOPIA	50	25	28	162	45	39	120	32.6	55.3
INDIA	34	15	36	134	41	52	180	676.2	976.2
IRAN	44	14	23	112	44	58	-	38.5	66.1
IRAQ	47	13	20	104	48	55	1,860	13.2	24.5
ISRAEL	25	7	38	15	33	73	4,120	3.9	5.5
JORDAN	46	13	21	97	48	56	1,050	3.2	5.9
KENYA	53	14	18	83	50	56	320	15.9	32.3
KUWAIT	42	5	19	39	44	69	14,890	1.3	3.1
LIBYA	47	13	20	130	49	55	6,910	3	5.7
MALI	49	22	26	190	48	39	120	6.6	11.6
MAURITANIA	50	22	25	187	42	42	270	1.6	2.9
MEXICO	37	6	22	70	46	65	1,290	68.2	128.9
MOROCCO	43	14	23	133	46	55	670	21	37.3
NAMIBIA	44	15	24	111	44	51	1,080	1	1.7
NIGER	51	22	24	200	47	42	220	5.5	10.
OMAN	49	19	23	142	45	47	2,570	.9	1.7
PAKISTAN	44	16	25	142	46	52	230	86.5	152.
PERU	40	12	25	92	44	56	740	17.6	29.2
QATAR	44	14	23	138	45	48	12,740	.2	.4
SAUDI ARABIA	49	18	23	150	45	48	8,040	8.2	15.5
SENEGAL	48	22	27	160	44	42	340	5.7	9.7
SOMALIA	48	20	25	177	44	43	130	3.6	6.3
SUDAN	48	18	22	141	44	44	320	18.7	31.8
SYRIA	45	13	21	114	49	57	930	8.6	16.2
TUNISIA	33	8	28	125	44	57	950	6.5	9.7
UNITED ARAB EMIRATES	44	14	23	138	34	48	14,230	.8	1.6
UPPER VOLTA	48	22	27	182	44	42	160	6.9	11.8
YEMEN (N)	48	25	30	160	47	45	580	5.6	9.5
YEMEN (S)	48	21	26	155	49	45	420	1.9	3.4

*Figures shown here are taken from the 1980 World Population Data Sheet (© Population Reference Bureau, Inc., P.O. Box 35012, Washington, D.C. 20013) reordered to show selected representative arid countries only. *Arid Lands Newsletter* gratefully acknowledges the Bureau's kind permission to use this copyrighted information, prepared by Carl Haub and Douglas W. Heisler, Demographers. Responsibility for the selection of countries and data reordering is *Arid Lands Newsletter's* alone.

FOOLS RUSH IN

Part 2: Selected Arid Lands Population Data

Continuing the presentation of statistical information relating to the geographic dimensions of global aridity [*Arid Lands Newsletter*, No. 10, April 1979, p. 17-18], we turn here to population data affecting the social structure of selected arid countries. To both the Washington-based Population Reference Bureau's World Population Data Sheet, 1980, and the Environmental Fund's World Population Estimates, 1979, we are indebted for some of the figures displayed in the following tables. Of their world coverage, we have broken out those representative arid countries we believe best exemplify many of the arid world's dilemmas:

- exploding population pressures
- desertification
- declining agricultural productivity
- hunger and malnutrition

In addition to the selection of particular countries from the world coverage to emphasize the aspects of aridity, we have reordered the information in five of the columns from the comprehensive chart, opposite, in such a way that our readers may find it more convenient to make their own correlations, inverse or otherwise, between birth rates and number of years to double the present population, for instance, or between infant mortality and percentage of the population under age 15.

We quote from our introduction to *Fools Rush In*, part 1:

“. . . We offer this [information] now, not as the last authoritative word, but only as a first serious attempt at identifying the arid/semi-arid country-by-country picture as we see it from our vantage point. We urge *Arid Lands Newsletter* readers to correspond with us if they have figures more accurate than these, and to assist us in all ways possible to revise, with more exactitude, the . . . picture we have presented. Since *Arid Lands Newsletter* is mailed out to persons in all countries listed, it is our hope that readers may call our request to the attention of country authorities if they themselves are not in a position to respond.”

Below we give pertinent explanatory extracts from the sources cited above relating to various prescriptions the user is urged to observe in the interpretation of the data shown.

—Patricia Paylore/J. Richard Greenwell

Notes to Tables:

- I. Information selected from World Population Data Sheet 1980 should not be used with other years' sheets as a time series. Because every attempt is made to use the most recent and most accurate information, data sources vary, and changes in numbers and rates from year to year may reflect improved source material, revised data, or a later base year for computation, rather than yearly changes.
- II. For the more developed countries with complete or nearly complete registration of births, nearly all rates shown pertain to 1977 or 1978. For most less developed countries with incomplete registration, rates refer to the 1975-1980 period. These figures should be considered rough approximations only.
- III. Based on the current unrounded rate of natural increase and assuming no change in rate.
- IV. Annual number of deaths to infants under one year of age per 1,000 live births.
- VI. Data refer to 1978 and are provisional. All data for individual countries are from the World Bank Atlas: Population, Per Capita Product, and Growth Rates, 1979.
- VII. Calculated from the weighted averages of coarse grains, wheat and rice yields figures for each country for the 1960s and 1970s. Source: USDA Foreign Agricultural Service, Supply and Demand Grain and Feed Data Base, 1979 (unpublished).

Table II. Birth Rate
(Annual Births per 1,000 Population)

KENYA	53
BOTSWANA	51
NIGER	51
ETHIOPIA	50
MAURITANIA	50
MALI	49
OMAN	49
SAUDIA ARABIA	49
AFGHANISTAN	48
ALGERIA	48
SENEGAL	48
SOMALIA	48
SUDAN	48
UPPER VOLTA	48
YEMEN (N)	48
YEMEN (S)	48
IRAQ	47
LIBYA	47
JORDAN	46
SYRIA	45
CHAD	44
IRAN	44
NAMIBIA	44
PAKISTAN	44
QATAR	44
UNITED ARAB EMIRATES	44
MOROCCO	43
KUWAIT	42
PERU	40
EGYPT	38
MEXICO	37
INDIA	34
TUNISIA	33
ARGENTINA	26
ISRAEL	25
CHILE	21
AUSTRALIA	16

Table III.
Number of Years to Double Population

KENYA	18
KUWAIT	19
ALGERIA	20
IRAQ	20
LIBYA	20
BOTSWANA	21
JORDAN	21
SYRIA	21
MEXICO	22
SUDAN	22
IRAN	23
MOROCCO	23
OMAN	23
QATAR	23
SAUDI ARABIA	23
UNITED ARAB EMIRATES	23
NAMIBIA	24
NIGER	24
MAURITANIA	25
PAKISTAN	25
PERU	25
SOMALIA	25
AFGHANISTAN	26
EGYPT	26
MALI	26
YEMEN (S)	26
SENEGAL	27
UPPER VOLTA	27
ETHIOPIA	28
TUNISIA	28
CHAD	30
YEMEN (N)	30
INDIA	36
ISRAEL	38
ARGENTINA	43
CHILE	48
AUSTRALIA	86

Table IV.
Infant Mortality

AFGHANISTAN	226
NIGER	200
MALI	190
MAURITANIA	187
UPPER VOLTA	182
SOMALIA	177
CHAD	165
ETHIOPIA	162
SENEGAL	160
YEMEN (N)	160
YEMEN (S)	155
SAUDI ARABIA	150
ALGERIA	142
OMAN	142
PAKISTAN	142
SUDAN	141
QATAR	138
UNITED ARAB EMIRATES	138
INDIA	134
MOROCCO	133
LIBYA	130
TUNISIA	125
SYRIA	114
IRAN	112
NAMIBIA	111
IRAQ	104
BOTSWANA	97
JORDAN	97
PERU	92
EGYPT	90
KENYA	83
MEXICO	70
ARGENTINA	45
CHILE	40
KUWAIT	39
ISRAEL	15
AUSTRALIA	12

Table V.
Percentage of Population under Age 15

BOTSWANA	50
KENYA	50
LIBYA	49
SYRIA	49
YEMEN (S)	49
IRAQ	48
JORDAN	48
MALI	48
ALGERIA	47
NIGER	47
YEMEN (N)	47
MEXICO	46
MOROCCO	46
PAKISTAN	46
AFGHANISTAN	45
ETHIOPIA	45
OMAN	45
QATAR	45
SAUDI ARABIA	45
IRAN	44
KUWAIT	44
NAMIBIA	44
PERU	44
SENEGAL	44
SOMALIA	44
SUDAN	44
TUNISIA	44
UPPER VOLTA	44
CHAD	42
MAURITANIA	42
INDIA	41
EGYPT	40
CHILE	35
UNITED ARAB EMIRATES	34
ISRAEL	33
ARGENTINA	28
AUSTRALIA	27

Table VI.
Per Capital GNP (U.S. \$)

KUWAIT	\$14,890
UNITED ARAB EMIRATES	14,230
QATAR	12,740
SAUDI ARABIA	8,040
AUSTRALIA	7,920
LIBYA	6,910
ISRAEL	4,120
OMAN	2,570
ARGENTINA	1,910
IRAQ	1,860
CHILE	1,410
MEXICO	1,290
ALGERIA	1,260
NAMIBIA	1,080
JORDAN	1,050
TUNISIA	950
SYRIA	930
PERU	740
MOROCCO	670
BOTSWANA	620
YEMEN (N)	580
YEMEN (S)	420
EGYPT	400
SENEGAL	340
KENYA	320
SUDAN	320
MAURITANA	270
AFGHANISTAN	240
PAKISTAN	230
NIGER	220
INDIA	180
UPPER VOLTA	160
CHAD	140
SOMALIA	130
ETHIOPIA	120
MALI	120

Table VII.
Annual Increase in Cereal Grain Yields (%)
1960-1969 1970-1978

- Afghanistan	2.0	1.7
+ Algeria	-1.9	3.2
- Argentina	3.4	1.7
+ Australia	-1.6	-0.3
- Chad	-0.3	-4.4
- Chile	3.5	-0.8
- Egypt	3.4	-0.03
- Ethiopia	1.5	1.4
+ India	1.4	2.6
- Iran	2.5	1.2
- Iraq	6.3	3.0
+ Israel	2.6	4.6
- Jordan	5.6	0.0
+ Kenya	0.3	2.9
+ Libya	1.2	2.1
+ Mali	-0.8	0.0
+ Mexico	1.2	1.6
+ Morocco	3.9	4.1
Niger	-0.5	-0.5
- Pakistan	5.0	2.2
- Peru	1.0	0.1
+ Saudi Arabia	0.08	6.6
- Senegal	1.7	1.0
+ Sudan	0.1	1.7
+ Syria	7.0	11.3
+ Tunisia	2.8	4.5
- Upper Volta	-0.2	-0.3
+ Yemen (N)	0.0	1.9
+ Yemen (S)	-4.5	4.8

* © Environmental Fund, Washington, D.C., prepared by Dawn Hill, 1979. Reprinted by permission.

??? HAVE YOU SEEN ???

Altschul, D.R. (1980) Transportation in African Development. *Journal of Geography* 79 (2):44-56.

Carefully distinguishing between national transportation (movements and systems within individual countries), intracontinental transportation (between African countries), and international transportation (which links African countries with other continents), this paper examines the structure, role, and needs of the continent's national and intracontinental transportation systems in the development process. Rail, road, and air systems are described, with supporting data, maps, and figures. The author believes changes will overtake colonial legacies of anachronistic transport patterns and organization if the requisite high investment in the development process can be given the priority it demands.

Askew, K./Mitchell, A.S. (1978) The fodder trees and shrubs of the Northern Territory. *Division of Primary Industry, Extension Bulletin* 16. 84 p.

Called "topfeed" here, native fodder trees and shrubs become an important part of available cattle fodder as a food reserve in times of drought, as a nutrient supplement when grasses have dried off and are of low food value, and as shade and for landscape stability. Given here are tables of nutritive values, species descriptions including habitat, ecology, distribution, phenology, forage value, and response to grazing. Illustrations, bibliography.

Carter, L.J. (1980) Global 2000: Vision of a gloomy world. *Science*, Aug. 1, 1980, p. 575-576.

Reviews the Global 2000 Report to the President, issued by the Council on Environmental Quality and the Department of State [for sale by the Superintendent of Documents, GPO, Washington, D.C. 20402 in three vols.: v. 1, summary, \$3.50; v. 2, technical report, \$13; v.3, global model, \$8], and compares it with other documents on similar themes such as the World Conservation Strategy and North-South: A Program for Survival.

Glassner, M.I. (1980) Bibliography on land-locked states. *Sijthoff & Noordhoff, Alphen aan den Rijn, The Netherlands*. 60 p. \$20.00. ISBN 90 286 0269 0.

Materials wholly, substantially and/or significantly related to access to and from the sea and access to the resources of the sea for land-locked countries which have appeared since 1945, culled from UN documents, books, articles, miscellaneous publications, theses and dissertations. Listings related to the topic from various disciplines: geography, international law, economics, international relations, the Law of the Sea, transportation.

Institute for Desert Research, Sede Boqer, Israel (1979) Scientific Report, 2d, 1979. Ben Gurion University of the Negev. 233 p.

Fields of research to which the Institute is dedicated include runoff farming/water harvesting, desert ecosystems, artificial rain, energy conversion, sociology of desert settlement problems, solar ponds, closed system agriculture, desert architecture/building climatology, urban planning, desert meteorology including albedo research, and hydrobiology. Progress in each of these fields is detailed in this second report, edited as was the first by Dr. Shabtay Dover. Plans for cooperative research on desert problems with Egyptian desert specialists are under way, as well as contracts and official agreements for mutual scientific investigations with a number of German institutions and one U.S. university.

Larson, D.L. (1980) The Arizona solar-powered pumping project. *Arizona Water Resources Project Information, Project Bulletin* 23. University of Arizona, Tucson, Office of Arid Lands Studies. [4] p.

An experimental 150-kilowatt solar-powered electrical generator began operating in October 1979 on a farm southwest of Coolidge, Arizona. At present only one other solar-power plant in the world rivals the Arizona installation in size, an Israeli plant recently dedicated. The Coolidge plant gathers solar energy from an area of approximately 23,000 sq. ft. The collector field is composed of 384 collectors, arranged in north-south oriented rows, rotating from east to west to track the sun during the day. They face the ground at night and in stormy weather to protect glass tubes and mirror surfaces. Not yet marketable, it is hoped that cost per kilowatt can be reduced so that it is competitive with that of coal-fired power plants.

Le Houerou, H.N., ed. (1980) International symposium on browse in Africa, Addis Ababa, 8-12 April 1980. Programme . . . [and] summaries of contributions. International Livestock Centre for Africa (ILCA), Addis Ababa, Ethiopia. 48 p. [Available in French: *Colloque sur les fourrages ligneux en Afrique*. 52 p.]

In addition to regional reviews covering southern and northern Africa and the Sahelian and Sudanian zones of west Africa, papers include those addressed to assessment of productivity, establishment and utilization, integration in livestock production systems, and research needs. In McKell's paper introducing the symposium, he calls for a worldwide perspective on multiple use of fodder trees and shrubs, pointing out that insufficient emphasis has been placed on the value of browse at nutritional stress periods in the year or in a drought cycle.

He pleads for a recognition that trees and shrubs hold greater value than is commonly appreciated as browse for livestock and wildlife, as plantings to control soil erosion and desert encroachment, as participants in nutrient cycling, and sources of fuelwood, and more generally as components of wildlife habitats.

McKee, E.D., ed. (1979) A study of global sand seas. Prepared in cooperation with NASA. U.S. Geological Survey, Professional Paper 1052. 429 p.

A major feature of this report, one of several issued to commemorate the USGS's 100th anniversary, is the compilation and comparison of available data based on many different methods of investigation. Evidence at one extreme is obtained from detailed studies of minute particles and analysis of individual grains. At the opposite extreme is evidence obtained from remote sensing, in which dune patterns, recorded from approximately 500 miles in space, are compared from one sand sea to another. Comparisons are also made between ancient and modern deposits for texture, structure, and other characteristics. The application of these studies to economic problems illustrates the importance of eolian deposits to our present culture and to human welfare. Photographs, drawings, satellite imagery. Bibliography of 500 citations.

Morales, C., ed. (1979) Saharan dust: mobilization, transport, deposition. Wiley, N.Y. 297 p. \$33.00 (paper)

Results of a 1977 workshop on Saharan dust, with summary and recommendations for further research.

Nechayeva, N.T. et al (1979) Vegetation yields in the central Karakum desert under different patterns of management (translated title). Hayka, Moscow. 255 p.

A summary of studies conducted at the experimental range in the central Karakum desert from 1960-1976, involving different types of ranges under different patterns of management including influence of protective management of vegetation, dynamic changes in vegetation due to stocking, and vertical distribution of phytomass in sagebrush communities. There is a section on methods of agrometeorological assessment and forecasting of rangeland vegetation yields, and a supplementary list of floral plants typical of the southern portion of the central Karakum. A national contribution to the MAB programme.

Paylore, P./Mabbutt, J.A. (1980) Desertification: World bibliography update 1976-1980. University of Arizona, Tucson, Office of Arid Lands Studies. 196 p.

A project of the International Geographical Union's Working Group on Desertification that attempts to bring up-to-date the explosion of information on this global problem since the 1977 UNEP conference in Nairobi. The 400+ citations displayed here are arranged, as was the original 1976 Bibliography by the same group, by areas: Worldwide, Africa (general, Sahara and Sahelian, East Africa and Sudan, and Southern Africa), the Middle

East, USSR, India-Pakistan, People's Republic of China, Australia, and the Western Hemisphere. Abstracts and subject/author indexes.

U.S. Strategy Conference on Tropical Deforestation (1978) Proceedings. Sponsored by U.S. Department of State and the U.S. Agency for International Development, June 12-14, 1978, Washington, D.C. 78 p.

Major conclusions and recommendations which emerged from this conference focus on the fact that the world is being confronted by an extremely serious problem with immediate and long-range socioeconomic and ecological consequences as the result of accelerating loss of forest and vegetative cover in semiarid lands within or near the tropical latitudes. Further, the community of nations must quickly launch an accelerated and coordinated attack on the problem if these greatly undervalued and probably irreplaceable resources are to be protected from virtual destruction by the early part of the next century.

Westinga, E./Thalen, D.C.P. (1980?) A survey and problem analysis of the rangelands in the Rada District. Rada' Integrated Rural Development Project, Technical Note 5. Yemen Arab Republic/Netherlands Ministry of Foreign Affairs, Department of International Technical Assistance. ILACO, Arnhem, The Netherlands. 132 p.

Increasing livestock production by the development and introduction of range management practices aimed at an optimal use of the rangelands was the main objective of this project. This particular "Note" details the survey method and results, use and degradation of the rangelands in question, and offers recommendations and lines of action with emphasis on inventory of forage demand-supply, firewood and energy supply, grazing trials, fodder shrub introduction, exclosures, and other experiments and demonstrations. Numerous photographs plus vegetation and landscape map of the district at a scale of 1:100,000, based on interpretation of aerial photographs with field surveys.

World Grazingland Study Newsletter, No. 1, March 1980- Department of Range Science, Colorado State University, Fort Collins, Colorado 80523.

Intended to display information on the world's grazinglands, their location, area, and average plant and animal productivity, undertaken as a contributing study to the MAB Project 3. Variability in yield will also be studied with particular emphasis on fluctuations due to climatic influences. The project seeks information and assistance from resource managers throughout the world in connection with expected review-and-development of mathematical models to predict grazingland production from climatic information. They are also interested in determining the contribution of crop residues and by-products to the annual diet of grazing animals. Information relating to maps of grazinglands in all countries and regions is solicited, as well as to published reports and papers.

PEACE CORPS AT WORK IN ARID LANDS

In more than a score of arid countries in Africa and Latin America, *Arid Lands Newsletter* goes to workers in the Peace Corps. We hear from them almost daily, telling us of their work in forestry, agriculture, schools, hospitals. They teach, demonstrate, care for, work side-by-side with natives in the field — and learn. For us, as Editor, it is heartwarming to know that the *Newsletter* goes to remote villages to be read and passed around, as we are told, among those who are most in need of information, news, ideas, and stimulation. Better there than gathering dust unread in high level offices and libraries.

So here's our personal salute to those of you have have written to tell us of your work, your problems, your solutions, your local confers. Mail is slow and uncertain, so perhaps some of you are already gone, to other posts or home. But wherever you are, we count you as friends:

Botswana:

Randall K. Bostick, Francistown
Don C. Cassidy, Tsabong
Roger Hutchison, Mochudi
Douglas MacDonald, Shashe
Elsa and Norman Rush, Gaborone

Chad:

Chris Kegler, N'Djamena

Chile:

Cathy E. Barnes, Huentelauque
John and Marion Reinsch, Temuco
William R. Zachmann, La Serena

Ecuador:

John D. Sebo, Jipijapa, Manabi
Leon Weber, Mira, Carchi

Ghana:

David Jones, Navrongo
L.A. Waldbillig, Hohoe

Guatemala:

Karen Foster, Jutiapa
James and Roxy McClure, Santa Rosa de Copan

Honduras:

Timothy R. Will, Choluteca

Jamaica:

Joseph Darrough, Manchioneal

Kenya:

Martin J. Brenner, Gakindu
Vicki Marks, Nairobi
Debbie Perkins, Ganze
Michael D. Wingren, Ruyenjes-Embu

Lesotho:

Alan J. Broughton, Maseru
Donna Julian, Peka
Louise Renhard, Mapoteng
Larry Veith, Maseru

Liberia:

John Bertram, Gbarnga

Malawi:

Eve Breitung, Chichiri, Blantyre
Lunn Marie Maguire, Lilongwa

Mali:

Dague B. Clark, Bamako
Monica Kerrigan, Bandiagara
David Payne, Bandigara
Linda Smith, Bamako
A. Throckmorton, Bamako

Mauritania:

Richard R. Haavisto, Boghe

Niger:

Steve North, Niamey
John Risley, Agadez
Robert Taylor
Bruce Wylie, Maradi

El Salvador:

Christopher K. Miller, San Salvador

Senegal:

Dean Christ, Dakar
Nancy Brendlinger, Ziguinchor

Tanzania:

Kevin D. Prelgovisk, Maliasili
Douglas Zollner, Dar-es-Salaam

Tunisia:

Mylen Bohle, Zannouch, Gafsa

Upper Volta:

Tom Jansen, Dedougou
Jack O'Dea, Kaya

Zaire:

Janel McMahan, Bukavu



Speakers from the Mexican delegation.

Ing. Luis Carlos Fierro Garcia (center),
 Depto. de Manejo y Pastizales INIP-SARH,
 who spoke on "Utilización de Obras de
 Captación de Agua, en la Resiembra de
 Pastizales Aridos y Semi-Aridos en el Norte
 de México."

(Left, Anaya Garduño; right, Shanan.)



Dr. L. Shanan (left), Center of International
 Agriculture, Rehovot, Israel, who spoke on
 "A Buried Membrane Collector for Har-
 vesting Rainfall in Sandy Soils."

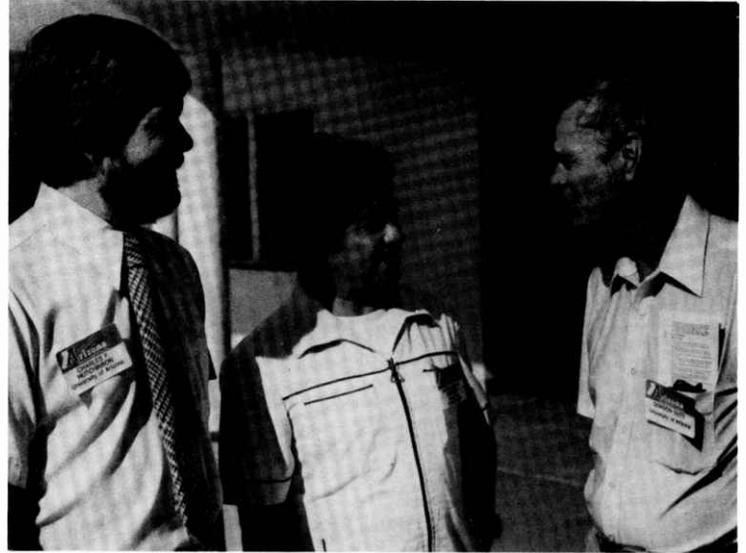
Dr. Ian Laing (right), Soils Division, Western
 Australia Dept. of Agriculture, South Perth,
 who spoke on "Rainfall Collection in
 Australia."

MEETINGS MEETINGS MEETINGS

RAINFALL COLLECTION FOR AGRICULTURE IN ARID AND SEMIARID REGIONS was the first in a series of three workshops commissioned by the U.S.-Mexico Working Group on New Crops, Arid Lands and Agricultural Productivity, sponsored by the Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State. Held in Tucson on September 10-12, 1980, the Workshop was organized jointly by the Colegio de Postgraduados, Chapingo, México (represented by Manuel Anaya Garduño) and the University of Arizona (represented by Charles F. Hutchinson, Office of Arid Lands Studies, and Gordon Dutt, Department of Soils, Water and Engineering).

Principal objectives of the Workshop were 1) to present the state-of-the-art in rainfall collection, and 2) to develop proposals for cooperative research and demonstration projects between the U.S. and Mexico. While the main focus was on primary agricultural production, a secondary interest emphasized the use of rainfall collection for rangeland improvement. Specific topics included those addressing the suitability of techniques for large-scale implementation, together with required equipment, as well as techniques for catchment design, soil treatment, water storage and application.

The state-of-the-art was covered by a panel representing experts from the U.S., Mexico, Australia, India, Israel, and Kenya. During field trips to nearby locations of University of Arizona projects, rainfall collection techniques were demonstrated. Cooperative proposals for specific investigations that may be undertaken by the



Chairmen (from left):
Hutchinson, Anaya Garduño, Dutt.

official Working Group of Mexican and U.S. experts were developed, and recommendations presented to the sponsors. The proceedings including all presented papers as well as a summary of the recommendations will be published in both English and Spanish.

(All Rainfall Collection meeting photos by Michael C. Parton)



ASSOCIATION FOR ARID LANDS STUDIES will hold its annual meeting in conjunction with the Western Social Science Association on April 23-25, 1981, in San Diego, California. This interdisciplinary organization is comprised of social scientists, earth scientists, and humanists with a common interest in arid lands teaching and research. Papers on all topics related to arid lands are welcome. Those interested in participating in this way should submit a title of proposed paper, together with an abstract (150 words or less) to the program chairman, Dr. William M. Holmes, Department of Geography, North Texas State University, Denton, Texas 76203. Deadline for receipt of abstracts is December 1, 1980.

BAT-SHEVA SEMINAR ON APPROACHES AND METHODS IN PALEOCLIMATE RESEARCH provided a framework for discussion on weathering, landforms and geomorphic processes, climatic indicators in desert formations, responses of soils to climate and time, and loess stratigraphy and genesis, when participants met in Jerusalem in late October 1980. Emphasis throughout was on arid areas, with field trips to appropriate locations. Hebrew University was host, plus other sponsors including the Weizmann Institute and the BatSheva de Rothschild Foundation for the Advancement of Science in Israel. Speakers included international specialists from the U.S., Australia, France, and the Netherlands. Dr. B. Luz, Department of Geology, Hebrew University, was the coordinator.

EL HULE NATURAL: HACIA EL AÑO 2000, SIMPOSIUM INTERNACIONAL, held in Saltillo, Coahuila, México, July 7-11, 1980. Organized by the Centro de Investigación en Química Aplicada, this symposium was sponsored by the State of Coahuila, Mexico's CONACYT, and the Comisión Nacional de la Zonas Áridas, with the cooperation of the International Rubber Research and Development Board and the Malaysian Rubber Research and Development Board. Programs were devoted to both natural rubber (*Hevea*), guayule, and synthetics. Speakers included experts from the USSR, England, Malaysia, France, the U.S., and Mexico.

INTERNATIONAL SYMPOSIUM ON THE IMPACT OF CLIMATE ON PLANNING AND BUILDING, to be held in Herzliya-on-Sea, Israel, November 4-7, 1980. Preceding the 35th World Congress of its parent body, the International Federation for Housing and Planning, meeting in Jerusalem following on November 9-14, this Symposium has been organized by the Federation's Standing Committee on Urban and Building Climatology to discuss such topics as climate in relation to both regional and settlement planning, climate and building design, and the improvements of local climates by landscape architecture. Organizing Chairman: Dr. Arie Bitan, Department of Geography, Tel Aviv University.

WHICH ISSUE OF SCIENCE DO YOU READ?

June 27, 1980, p. 1431:

“. . . False bad news about population growth, natural resources, and the environment is published widely in the face of contradictory evidence. For example, the world supply of arable land has actually been increasing, the scarcity of natural resources including food and energy has been decreasing, and basic measures of U.S. environmental quality show positive trends. The aggregate data show no long-run negative effect of population growth upon the standard of living. Models that embody forces omitted in the past, especially the influence of population size upon productivity increase, suggest a long-run positive effect of additional people.”

—Julian L. Simon, *Resources, Population, Environment: An Oversupply of False Bad News*.

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July 4, 1980, p. 148-157:

“. . . Growth rates in developing countries are high. These will be moderated somewhat during the next two decades, but the momentum of population growth is high, and this momentum will lead to larger and larger absolute increases in the population of the developing countries during the remainder of this century, even though fertility rates continue to decline. This momentum of population growth is caused by an age structure with a relatively large proportion of young persons who will move into and increase the number in the reproductive ages for at least fifteen, and more likely more than twenty, years.”

—W. Parker Mauldin, *Population Trends and Prospects*. Reprinted by permission of **Science** © 1980 (0036-8075/80/0704-0148) and of the Author

??? DID YOU KNOW ???

• • • that despite the number of organizations worldwide paying lip service to the concept of “appropriate technology,” the one best known to us which practices in the most comprehensive and dedicated way its commitment to concentrate on the problems of water and power scarcity affecting individual persons and small communities in arid-developing areas is

The Brace Research Institute
Macdonald College, McGill University
Ste. Anne de Bellevue
Quebec, Canada H9X 1C0

Now coming up on its twentieth year, its basic philosophy has been to develop saline water conversion, pumping and other energy consuming equipment using to the greatest degree possible local energy, material and human resources *so that the technology can find identity with the infrastructure of the local community* [emphasis ours]. “Whatever we design, construct or discover, the final proof and justification of its merit is its acceptability by man,” they insist, and titles of some of their many publications bear out their dedication to this facet of the human equation so often neglected — the dignity of man:

- A simple electric transmission system for a free running windmill
- How to construct a cheap wind machine for pumping water
- Solar cooker
- Greenhouse construction plans
- Experimental testing of a solar pond

Many are available in French, Spanish, and Arabic as well as English. In addition, “fact sheets” [fiches sommaires] are offered, briefs on very specific subjects without great detail but useful as a basis for further in-depth study, including those on windmills for water pumping on farms, lists of wood-burning equipment manufacturers in Canada, commercially-available windmill systems and components, and many others. On the subjects of greenhouse agriculture, desalination, solar energy, and wind power utilization, the Institute’s library contains some of the most extensive and thoroughly indexed material generally available.

• • • that the use of laser beams to level farm fields on the Gila River Indian Reservation in Arizona and jojoba plantations in the Harquahala Valley, Arizona, is expected to enable farmers to save water and time, as water is “pushed” through flat fields in half the normal time, and irrigation runoff is minimized. Some predictions are that “a farm will use 30 or 40 percent less water by switching to laser-beam leveling.” Equipment needed includes tractors which haul the box scrapers on which the sensor is mounted, and digital readout screens which pick up readings on high and low points in the field as they are transmitted from centrally located and stationary laser devices emitting those signals.

—AP, September 14, 1980

FAO JOB OPENINGS IN LIBYA



The Food and Agriculture Organization of the United Nations has openings for range management research scientist, range ecologist, range management expert, fodder crops expert, and pasture ecologist for two- and three-year postings to

Misurata (32.24N 15.04E) and Tripoli, to work in three projects operated jointly by FAO and the Libyan Government, designed to maintain and improve Libya’s pasture lands. Main objectives:

- investigation and research on national exploitation and management

- preparation of management models for various ecological zones
- development of fodder crops and establishment of forage reserves
- integration of pastures, fodder crops, and animal husbandry activities

Interested qualified experts should write to FAO, Manpower Planning Unit, Agricultural Operations Division, 00100 Rome, Italy, and enclose curriculum vitae quoting UTFN/LIB. Candidates from North America should send their credentials to the FAO Liaison Office, 1776 F Street, NW, Washington, D.C., 20437.

INTERNATIONAL ARID LANDS VISITORS TO UA/OALS

ALGERIA:

Organisme National de la Recherche Scientifique (ONRS), represented on a visit to explore the possibility of scientific cooperation in arid lands research, September 3-5, 1980, by:

Salah Djebaili, Director General, ONRS, Algiers
Mustapha Bouhadef, Director, ONRS Solar Energy Station, Bouzareah, and Coordinator of Program of Graduate Study in Solar Energy, University of Science and Technology, Algiers



Dr. Bouhadef

—photo by W.G. McGinnies



Dr. Djebaili

—photo by W.G. McGinnies



The group at Schuchuli

—photo by W.G. McGinnies

Field trip to Schuchuli, Papago Indian Reservation, a solar-powered village (described in *Arid Lands Newsletter* No. 11, p. 28).

ARGENTINA:

Ing. Agr. Hector Felipe Calella, Sede Universidad Chemical, La Rioja, April 1980

Ing. Agr. Oscar Mariano Diaz, Universidad Provincial de La Rioja, April 1980

EGYPT:

Dr. Mohamed El-Beltagy, Associate Professor, National Research Center, Cairo; Head, Plant Production Research Team, June 30-July 1, 1980

Dr. Fayez Hanna, Head, Soils and Water Use Laboratory, National Research, Cairo, June 23-24, 1980

Dr. Abdel-Hamid Talaat Higazi, Director, Botany Laboratory, National Research Center, Cairo, May 27-29, 1980

Dr. Mahmoud Ali Saleh, Advisor in Food Technology to Ministry of Economy, Cairo

Dr. Adli Bishay, Director, Desert Development Demonstration and Training Centre, c/o American University in Cairo, July 12-15, 1980

ENGLAND:

Miss Mary Cherry, Agricultural Writer, British Broadcasting Corporation, London, June 10, 1980

ISRAEL:

Dr. Yitzhak Gutterman, Institute for Desert Research, Ben-Gurion University of the Negev, Sde Boker, August 4-5, 1980

Dr. David Wolf, Rector, Ben-Gurion University of the Negev, Beer-Sheva, August 1980

MEXICO:

Ing. Heriberto Para Hake, Centro de Investigaciones Forestales del Noroeste, La Paz, Baja California, México, April 17, 1980

Dr. Manuel Anaya Garduño, Centro de Edafología, Colegio de Postgraduados, Chapingo, México, June 4, 1980

PEOPLE'S REPUBLIC OF CHINA:

Academia Sinica, Beijing, delegation of desert experts touring the U.S. under the auspices of the National Geographic Society [see *Arid Lands Newsletter* No. 11, April 1980, p. 14-21, for account of NGS delegation to the PRC in the summer of 1979], May 14, 1980

Chao Sung-Chiao, Professor of Physical Geography and Desert Research, Institute of Geography, Academia Sinica, Beijing, who lectured on "Land Types and Available Land Resources in China," on the continuing Arid Lands Colloquium series, June 13, 1980

SENEGAL:

Abdoulaye Kane, Head, Forestry and Reforestation Department of Senegal's Forest and Waterways Service, Dakar, in the U.S. as an Eisenhower Exchange Fellow, May 22-23, 1980

Secretariat d'Etat a la Recherches Scientifique at Technique, Dakar, March 25-April 4, 1980, represented by:

Madiena Diouf, Directeur de l'Innovation et du Progrés Technologique

Alpha Ndiaye

Papa Mody Ndiaye, Directeur de Division de Recherche Industrielle

Senegal River Basin Development Organization (OMVS): A group effort devoted to research into the management and administration of irrigation projects and other agriculture/water investigations based on common regional resources, represented on a visit July 8-August 6, 1980, by:

Mali: *Nanga Berthe*, Chief, Agricultural Education, OMVS Center, Samé (Kaye)

Mauritania: *Amadou Bachirou Baro*, Directeur Recherche Agronomique, Kaédi

Boubacar Cisso Diallo, Chief, Animal Science and Feeding Section, Ministry of Rural Development, Nouakchott

Senegal: *Moustapha Ba*, Chief, Division of Animal Production, Dakar

Mamadou Sonko, Director, Center for Agricultural Research, Dakar

SYRIA:

Dr. Mohammed El-Khash, Director General, Arab Center for the Studies of Arid Zones and Dry Lands, Damascus, September 15-19, 1980

YEMEN ARAB REPUBLIC:

Dr. Abdulwahab Muhmud, Minister of Agriculture, Sana, August 11-12, 1980

UPPER VOLTA:

Jean J. Nikyema, Ministry of Rural Development,
Ouagadougou



M. Nikyema, left, and his interpreter G.B. Plotkin, center, examine simple solar energy supply system using a junked refrigerator door fitted with coils and copper tubing under the heavy glass top, as a solar hot water heater. Owner and designer Gilmore Gilbertson, Tucson, right.

—photo by Manuel Miera, reprinted by permission of TUCSON
CITIZEN

ON THE OTHER HAND . . .

In refutation of the editorial in the April 1980 issue of *Arid Lands Newsletter*, we have James R. Arnold's article, "The Frontier in Space," in the May-June 1980 issue of *American Scientist*, p. 299-304, in which he concludes: ". . . When people are moving in and out of space on the Shuttle, and when other people are permanently occupying the Soviet Salyut and its descendants, the change will begin. . . . Space is the empty place next to the full place where we live. I believe we will be true to our nature and go there."

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