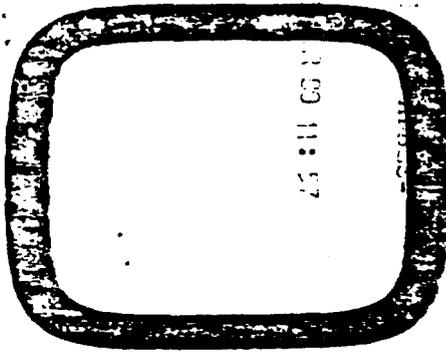


PEOPLE ARE

MARCH 1980



EDITOR'S NOTE:
*nice in a generation,
if we're lucky,
comes a reporter
such as Flora Lewis.
Not since Janet
Flanner have we
seen this kind of in-
terpretive journal-
ism that goes
beyond reporting of
facts—accurately,
vividly, precisely—*

*to give shape and meaning to illusive,
chaotic events, without sensationalism and
with purposeful restraint. Nor have cultur-
al events been covered with quite such an
insider's assurance. Lewis, Los Angeles-
born New York Times bureau chief in
Paris and award-winning European diplo-
matic correspondent, consistently files sto-
ries from the world's hottest news spots.*

*Thirteen years ago, Flora Lewis pub-
lished "One Of Our H-Bombs Is Missing"
(McGraw-Hill Book Company), her ac-
count of the nuclear nightmare that oc-
curred at Palomares, a Spanish village, in
1966. She went back to Palomares about a
year ago, for another look, and explains
here how the villagers have learned to live
with nuclear anxiety—an anxiety that af-
fects us all.*

Palomares, Spain—The nuclear age
came to Palomares with a rain of fire
from a clear blue sky. It was on January
17, 1966. Two United States Air Force
planes, one a B-52 carrying four hydro-
gen bombs on routine Strategic Air
Command alert duty and the other a
KC-135 tanker, met six miles above
Spain's southeastern coast for the regu-
lar refueling rendezvous. They crashed.
Flaming aviation gas engulfed both craft
and they broke up, spattering debris
across the land and the sea. All four
members of the tanker crew and three of
the bomber crew were killed, three oth-
ers survived. Miraculously, though some
pieces of the burning wreckage weighed
tons and fell in and near the village, no
one else was hurt and no house or build-
ing damaged.

Three of the four H-bombs fell on the
land. The fourth was found and recover-
ed from the sea bottom after a night-

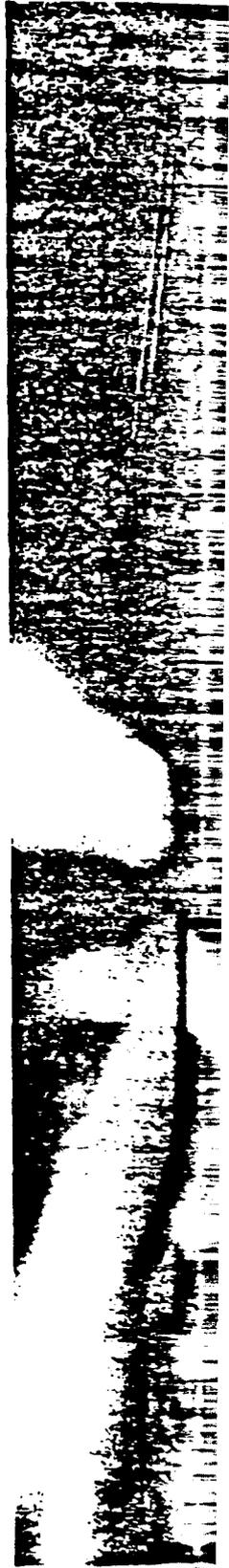
marish search which lasted eighty-one
days and attracted the world's attention.
Less understood and explained was the
fact that the conventional explosive in
two of the bombs detonated on impact,
pulverizing the plutonium "melon" and
spraying at least 226 acres of land
around the village with minute but po-
tentially deadly particles of plutonium.
There was no Hiroshima, no nuclear ex-
plosion, no visible sign of danger or dev-
astation apart from the blackened
chunks of metal and the carbonized bod-
ies of airmen.

Still, it was the worst nuclear accident
ever registered, "many orders of magni-
tude more serious than Three Mile Is-
land, I hesitate to say how many," said
Chester R. Richmond, Ph.D., associate
director for Biomedical and Environ-
mental Sciences at Oak Ridge National
Laboratory and a member of the U.S.
team still following the consequences of
the accident, both to help protect the
people and to learn more about how to
deal with the unintended catastrophes of
the radioactive atom. In comparison, he
said, the 1979 incident at the Three Mile
Island atomic energy plant near Harris-
burg, Pennsylvania was a "trivial release
of noble gas which doesn't seek (bone or
other life-involved compounds) or react.
There simply is no comparison of the
gravity of the incidents."

Physically, of course, they were quite
different. The danger at Three Mile Is-
land came from the radioactive isotopes
of normal elements produced inside the
reactor which, if they contaminated the
air, the water, the soil of the surround-
ing area to a significant degree, could
produce cancer and other radiation-in-
duced disease. Plutonium, a man-made
element with a half-life of 24,400 years,
is far more dangerous if it settles inside
the body, but it emits mainly alpha rays
which are very short and unable to pene-
trate most surfaces. Even skin is a pro-
tection, but the particles are invisible
and so deadly even in a small concentra-
tion that breathing or swallowing an un-
noticeable (Continued on page 367)

U.S. DOE ARCHIVES
326 U.S. ATOMIC ENERGY COMMISSION
RG
Collection 320
Box 16 - Palomares
Folder 26 - Press

BY FLORA LEWIS



FOREIGN CORRESPONDENT, JOURNALIST FOR OUR TIMES—AND HER

F L O R A

FLORA LEWIS

(Continued from page 322)

amount could lead to fatalities years later.

There have been a considerable number of nuclear accidents of many kinds, mostly military so far. So far as is known, there has never been an accidental nuclear explosion although reports have reached the West of a devastated area in Soviet Siberia where a major nuclear accident occurred many years ago. Apart from that inadequately documented event, wide-spread plutonium contamination of the atmosphere and earth surface has come about through weapons tests and two U.S. accidents, the one at Palomares and another, somewhat similar but much easier to handle and clean up, near Thule, Greenland, in 1968.

The late Wright Langham, a health physics specialist who worked at Los Alamos from the start of the World War II Manhattan Project until his death in a plane crash seven years ago, wrote in 1969:

"Although no plutonium contamination incidents have occurred within the public domain" (there have been known incidents on U.S. military test ranges in New Mexico; Rocky Flats, Colorado; and a U.S. Air Force base in Morocco) "that have imposed serious risk on a population group, the probability that such might occur is likely to increase with the current increasing trends in production and the use of plutonium isotopes. Plutonium is my favorite element for both objective and personal reasons. Plutonium currently is the most uniquely useful substance to come from alchemist Seaborg's works and dreams." (Glenn Seaborg, former chairman of the Atomic Energy Commission, codeveloped the hitherto unknown element in 1941. Since then, tiny quantities have been detected in nature but so small that they are judged no risk.) "Plutonium-239 was the fissionable material that ushered in a new era in weaponry with the detonation of the first atomic bomb on July 16, 1945, near Alamogordo, New Mexico. It still is used extensively in present-day fusion weapon systems. Although this use may be of negative esthetic value, it nevertheless is a reality.

"On the positive side is the great potential of Plutonium-239 as a reactor fuel in 'breeder reactor' concepts. In addition, because of its abundance, it is used extensively as a starting material for the production of transuranic elements of greater mass number." (Uranium is the 92nd element and the last on the classical charts, before nuclear physics extended the list.) "Plutonium-238 (half-life ninety years) is one of the most practical radionuclides for radioisotopic power generators. Such light-weight, dependable power sources are already finding space and terrestrial applications. . . ."

The total amount of Plutonium-239 contributed by man to the world environment by 1969 "may amount to about five hundred kilocuries," Dr. Langham said. "At the present time, these results are more significant to the demonstration of the extreme sensitivity of plutonium detection methods than they are to human health. This in no way belittles the importance of such measurements. On the contrary, assessment of the importance of future incidents may require knowledge of the situation prior to such incidents."

Because of the difference in population density and habits, Dr. Langham said there

VOGUE TO GO

Please check the brochures you would like to receive and return this column to VOGUE, TP03, Box 3374, N.Y., NY 10017. BEFORE JULY 1, 1980 Allow 6-8 weeks for delivery.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

WHERE TO GO

306 IRELAND: "From Ireland With Love"

406 NORTH CAROLINA: "Travel Package"

388 BRITISH VIRGIN ISLANDS: BVI Tourism Directory

STAYPLACES in the BRITISH VIRGIN ISLANDS

921 SMUGGLERS COVE HOTEL

809 PETER ISLAND HOTEL & YACHT HARBOUR

922 PROSPECT REEF RESORT HOTEL & HARBOUR

CRUISES

240 CUNARD LINES: QE2 World Cruise 1980

246 DELTA STEAMSHIP LINES: "Cruises to South America"

652 TRAVELINE INC.: "The Civilized Way to See Greece"

252 TORTOLA YACHT CHARTERS: British Virgin Islands

SUNSPOTS

923 PALM BEACH POLO & COUNTRY CLUB: Florida

808 PETIT ST. VINCENT RESORT: The Grenadines, West Indies

909 LA COSTA HOTEL & SPA: Carlsbad, California

414 KIAWAH ISLAND: South Carolina

811 THE CLOISTER HOTEL: Sea Island, Georgia

We're sorry, but VOGUE TO GO cannot answer any personal questions or requests

was little point in contrasting the Thule incident, involving an ice sheet, and Palomares. "It would seem much more important," he said, "to consider (what might have been the situation if) the problem had occurred in a suburb of Washington, DC, or Omaha, Nebraska, or in a wheat field in Kansas. Weapons also are not the only potential source of plutonium contamination incidents. On a same-weight basis, with other factors the same, a Plutonium-238 incident would be worse by a factor of 270."

Dr. Langham was in charge of the initial Palomares cleanup and made the basic decisions on what had to be done to reduce contamination acceptably below the level of risk. A trim, bouncy man whose twinkling sense of humor sets off his earnest dedication to a grim subject, he had played a major role at his Los Alamos laboratory in setting the base standard of "maximum permissible dose" by which risk is still assessed. After years of experiments on plants and animals, there came a time when the human question had to be faced. There was a story that he became his own guinea pig and drank a carefully measured dose in a Martini. Asked about that shortly after his return from Palomares, Dr. Langham laughed and said, "You don't understand. No liquor is allowed in the laboratory, so I had to take it in a glass of water."

The biggest part of the Palomares cleanup involved having airmen shove some fifteen hundred tons of dirt into oil drums which were shipped to the Atomic Energy Commission's burial ground in South Carolina. They were entrenched under ten feet of native American earth after some abrasive arguments with the Department of Agriculture

over the danger of more mundane insect contamination from foreign soil. A lot more of the land around Palomares was plowed under, wetted, and broken up in order to dilute concentrations of the metal and prevent its being sprayed back into the air by gusty local winds. But a detectable level of plutonium is still there. As a result of the accident, the place remains the world's largest unwitting proving ground for monitoring and measuring the aftereffects of contamination.

Lt. Col. Lawrence T. Odland, formerly of the U.S. Air Force Radiological Health Laboratory, published a report in 1968 on check-ups of the Americans who had worked in Palomares after the accident. "Not one individual who participated in the Palomares operation demonstrated a systemic long-term retention in amounts exceeding the maximum permissible," he wrote, but he also urged the advisability of "collecting as much pulmonary and thoracic lymphatic tissue as possible" from people who were there and "have come to autopsy."

Palomares had a population of twelve hundred when the crash happened, a collection of white-washed farm cottages dotted across the sere hills, with no real streets, only one bar, one tiny church (separating boys and girls), and one modest hall, where an occasional movie was shown, to give it the status of a community. There had been lead mines in the area in the past; broken down smelters and fields of slag still separate farm plots. But the mines shut down while the donkey was still the most advanced local means of transport, and the village slumped back into old Andalusian poverty. It has, its inhabitants boast, "the most" (Continued on page 368)

FLORA LEWIS

(Continued from page 367)

ideal climate in Spain," virtually year-round sunshine. That was why, though the U.S. Air Force never suspected it until the crash, the people were accustomed to watching the strange daily couplings of airplanes at the refueling spot thirty thousand feet above them. And it was why they had come to rely for their living on the winter tomato crop sent elsewhere in Spain and Western Europe.

The soil is good enough, but rain is minimal. It is rugged desert area, the ochre and sienna cliffs cut by steep gorges and covered in grey-brown brush, except for the brief periods when rainstorms bring out wildflowers. It looks so much like the desert of New Mexico and Arizona that off the sinuous road to America some fifty miles away, there is a sign pointing to "Poblado Mini-Hollywood," a site once favored by American movie companies to film cheap Westerns.

Unless the rains have been heavy for a few seasons, the water in Palomares, about a mile from the sea, is saline. The crops and the livelihood depend on how much water there is, and how salty. For a long period after the accident, there was not much. In those years, a major complaint of villagers against the U.S. was that the water table was low and the salt level high—not because of the plutonium but, they believed, because the approximately seventeen hundred airmen sent down for the operation had used up so much water washing houses, wetting fields and hills to tamp and mulch under plutonium-bearing dust.

Now, the Guardia Civil lieutenant in Gar-

rucha, a little nearby port turned tourist haven, says that Palomares is "rich." The term is relative. But tomato crops have been good, Spain's trade with the Common Market has greatly expanded. There are some two thousand inhabitants in the village, and lots of them have cars and trucks and motorbikes, all of them have electricity and almost all have TV. The whitewashed houses are larger, with good tile roofs and attractive iron grille work on many. Construction crews are always building something. Tourists don't stay in Palomares, but they tramp through the area every year leaving money behind.

"You will find Palomares very changed," said Dr. Emilio Iranzo, head of the Division of Medicine and Protection of Spain's Junta de Energia Nuclear, who is in charge of the follow-up. "The standard of living has doubled." He works in Madrid at the JEN's headquarters in University City and revisits the site from time to time.

"Life goes on," said Manolo Gonzalez down in the village, son of Don Jose Manuel Gonzalez Fernandez who was honorary mayor at the time of the accident.

"It's normal for places to grow," Don Manolo said, "and people here are very attached to the land. If they go abroad to find work, they always plan to come back to stay as soon as they have enough money. Families are very close." He and his wife, Dolores Alegria, who teaches school, have three children now. She was pregnant with the eldest when the bombs dropped. Like everyone who is old enough, they remember that time in 1966 vividly, but they don't talk about it much. There isn't much to say.

At Valero's bar, a young man who had

been away on military service at the time said jokingly, in answer to a question, "Well, people still die here, but not from that. Hey, Pepe," he called to a wizened elder with watery green eyes and a sly smile, "how many people die here in a year?"

"Maybe ten, or fifteen, or twenty. . .," said Pepe, clearly both pleased to get into a conversation with a rare stranger visiting the village, and cautious in the age-old manner.

"But they're younger now, aren't they?" said the young man, in a taunting voice.

"Young and old, like always," said Pepe chuckling.

There have been no known deaths, maladies or congenital deformations traceable to the accident. Every year, a group of villagers (selected without their knowledge by Dr. Iranzo to provide a range of ages and sexes, of those presumably exposed to the initial plutonium clouds when the contamination was highest and those almost certainly too far away or well-sheltered from it) are invited for an all-expenses-paid trip to Madrid. Pepe had gone, but he wouldn't admit that it was a lark or that he had enjoyed the big city. Like other villagers, he spoke only of the tests—a complete physical checkup which he appreciated, blood and urine samples taken, and being put "on the grill," as they refer to being scanned by the whole-body counter sent from America to monitor an individual's total radioactivity. Everybody has some. There is, for example, a bit of the isotope Potassium-40 in the human body. A way of measuring a person's potassium level is to scan for Potassium-40 and calculate from that whether the body content of the mineral is adequate, Dr. Iranzo had explained.

"But they don't tell you anything," Pepe complained, "except that you have too much sugar and shouldn't drink wine, or something like that. They never tell you the results. What do we know? I can tell you if there are changes here it's not because of the Americans, it's our own hard work. . ."

The young man dropped his mocking tone. "That's right, people work very hard here. We've bettered ourselves. The Americans left a lot of money behind" (in compensation for crops destroyed, animals slaughtered for testing, fields declared off-limits during the search for the missing bomb) "and some people got some, some didn't. But that didn't make the difference. It's our work."

A conversation about the accident in Palomares almost never stays very long on fallout, almost always turns quickly to compensation money. It was all that was made visible and intelligible to the villagers during the intense, nearly neurotic secrecy of the search and cleanup operation and scarcely dissipated since. The only tangible reminder of the accident is a neat green cottage, surrounded by a well-tended garden and an iron fence, put up by the JEN for working space in organizing samples of soil, plants, snails, and such to be sent off to Madrid for analysis. There are four white boxes on stilts, the size of a beekeeper's hive, to collect dust from air samples every twenty-four hours. Francisco Moreno, who lives nearby but has nothing to do with the villagers, takes the filter papers from them each day and mails them to Madrid.

"He won't tell you anything," people in Palomares kept saying. At his house, near a little restaurant a mile away, his wife answered inquiries irritably. "He's not here, and there's no use coming back because he

Don't be a slave to your razor. ZIP off unsightly hair for months.

You can keep on shaving your legs every three or four days. Or keep them carefree and hair-free up to 60 days with ZIP-wax.

ZIP-wax is the same natural beeswax those high-priced salons use. It's smooth and easy going on—and it keeps hair off by zapping it right at the roots.

So for that shaving vacation, you can pay \$50 at a salon. Or you can buy ZIP-wax for just \$2.33.

Can't find ZIP-wax at the store? Send \$3.00 (incl. postage) for a 3.3 Oz. package with full instructions.

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

V.S.3

Colgate Chemical Co.
225 Macdonald Avenue
New York, N.Y. 10022



won't talk to you. He doesn't talk to anybody about the JEN and Palomares."

Suspicion and fear based on secrecy and misunderstanding remain, thirteen years later, the most painful aftermath of the accident for people in the region. Many villagers, quite uncertain about what the tests have really shown about their bodies and their land, express their doubts by saying they are convinced the fourth bomb is still in the nearby sea. Nobody invited people from Palomares to the Sixth Fleet's flagship U.S.S. *Albany* when the lost bomb was paraded by on a launch, the only public display of an H-bomb ever made, and then grudgingly, to Spanish officials and accredited journalists, to prove the recovery had not been a charade.

Even Francisco Simo Orts, the fisherman from the port of Aguilas up the coast near Murcia, doesn't believe the real bomb was removed. He has come to be known in the region as "Paco, El de la Bomba," because he was the one who saw parachutes falling, who rescued two American fliers from the sea, and kept pointing out to the U.S. Navy the spot where he claimed a "dead man" hanging from a third chute entered the water. The Navy kept questioning him during the search, but was just as skeptical in its own way. It couldn't believe that the master of a small shrimping boat, with none of the U.S. Navy's sophisticated navigation aids, could possibly have made an accurate observation about the point of descent of the chute which its experts knew had to be carrying the bomb. But Paco was right. The search could have cost far less time, anguish, and millions of dollars if his advice had been accepted.

Concern that the Mediterranean had been made radioactive has vanished now, not so much because the then U.S. Ambassador Angier Biddle Duke and his family took a demonstrative, shivering plunge on a March day to show it, but because the passing years produced nothing at all untoward. Still, disbelief that the bomb is really gone persists because there was so much deception, obfuscation, lack of information on other counts; and in many ways, there still is.

Paco de la Bomba says darkly that a little over a year ago his nets were cut by something, something moving near the critical spot, and he hints that it may have been a submarine still prowling secretly underwater for the bomb that was supposedly recovered.

Roberto Puig, a chubby architect and artist who lives in the resort town of Mojácar high on a hill overlooking Palomares doesn't believe the real thing was brought up either. He has built a large modern hotel in Mojácar and created there the only monument to the worst nuclear accident in existence. It is a mural, covering a long wall, a kind of sculptured collage made of a big scrap of airplane wing on which parts of the letters USAF can still be seen, other pieces of debris he collected, and scraps from old boats. But he hasn't even put up a sign or plaque to explain it.

"Someday I will," he said laughing, but he tells dark stories about what he thinks has really happened, about people dying of leukemia, mentally retarded children, and, more gleefully, that Spain's whole nuclear-energy program was secretly launched on the basis of four hundred grams of plutonium scraped together and spirited away from the region. The last notion is preposterous and there is no evidence at all to support the rest, but not much effort has been made to convince him.

Antonio Sabote Flores, now eighty-one, whose house was near where one of the bombs fell and broke, thinks his lethargy and poor memory and his wife's rheumatism are the result. They were one of the poorest families, with thirteen children. Now the house has been enlarged and improved. His daughter Paquita, a peach-skinned, shy child of nine when the bombs fell, has a gurgling, giggling baby of fifteen months now and she worries much more about whether her husband, working in Germany, will be able to save enough to buy her a house and come home. But she nods gravely at her father's and mother's stories, and just as gravely at her more gregarious sister's assurance that of course Palomares is the only place for them to live. Glona, the sister, spent several years working in Switzerland and has her own house now. The father, somnolent in a folding chair on the vine-covered terrace, ventured to speak again.

"My father died at sixty-six, and my mother at sixty-seven. I'm over eighty." His broad grin was toothless, his face stubbled, his voice weak. "So you see, it is good in Palomares."

Only the schoolteacher Don Pedro Domingo Sanchez Gao and his wife Dolores, not natives of the region but accustomed to it now and no longer disdainful of the villagers, and Manolo Gonzalez have a fairly clear idea of the meaning of the vast operations which followed the accident.

"Oh I believe they got the bomb out of the sea all right," said Don Manolo, "although they should have included people here when they showed it. We saw the other ones on the ground, we touched them, we would have known it was really the same thing. But any-

DOE ARCHIVES

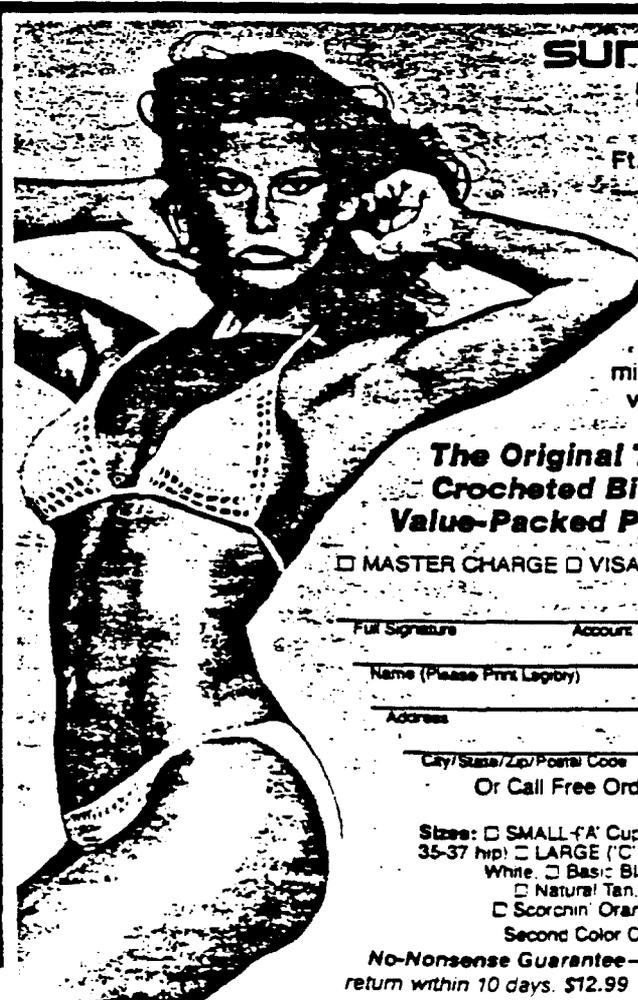
way, if they hadn't gotten the fourth one, there would be Russian submarines and all kinds of people sneaking around looking for it. I don't doubt that, and we haven't had any trouble, but they still don't tell us much."

Dolores Sanchez said that, "Of course, we didn't know anything about radiation then. Now I know that I don't like nuclear energy. But here, there's so much sun, plenty of room for solar energy. They won't make nuclear plants here."

With scarcely any natural sources of fuel, Spain has an ambitious nuclear-energy program to sustain its rapid industrial development. It is intensely controversial, but for reasons which seem to be more directly involved with the explosive regional arguments than with the nuclear danger itself. The biggest issue is the planned Limoniz plant near Bilbao, in the northwest, in the highly industrialized Basque area. Basque separatists have bombed installations to assert their claim that whether or not to have a nuclear plant in the area should be an independent Basque decision, not an order from Madrid. It is not clear whether the same agitators would oppose the plant if there had been a Basque government in favor of it.

In Barcelona, where some Catalan activists still grumble despite general satisfaction with the degree of autonomy worked out with Madrid, graffiti scrawled on a wall near the superb medieval center of the city said, in Catalan, "Yesterday Palomares, today Huesca, tomorrow...? Yankees go home."

There are no such complaints on view in the Palomares area. It is a region with a relatively high degree of natural background radiation, though (Continued on page 370)



SUNUP/ SUNDOWN

P.O. Drawer 11899
Ft. Lauderdale, FL 33339

For your hand crocheted bikini, send only \$12.99 plus \$1.75 for handling (Florida deliveries add 4% sales tax). We do offer mixed size service—indicate very clearly and add \$5.00.

The Original Totally Outrageous Crocheted Bikini at our Original Value-Packed Price of only \$12.99

MASTER CHARGE VISA CHECK/MONEY ORDER

Full Signature Account Number Expiration Date

Name (Please Print Legibly)

Address

City/State/Zip/Postal Code Ship 100-VG-3

Or Call Free Order Desk Only (800) 327-5559
In Florida (305) 772-5793

Size: SMALL (A Cup, 33-35 hip) MEDIUM (B Cup, 35-37 hip) LARGE (C Cup, 37-39 hip) Colors: Virgin White Basic Black Ocean Blue Chocolate Natural Tan Deep Purple Forest Green Scorchin' Orange Sor. Pink Lemon Yellow
Second Color Choice _____

No-Nonsense Guarantee—Refund if not totally satisfied, return within 10 days. \$12.99

SPECIAL
PARIS
COLLECTIONS
ISSUE

FRENCH

FLOWN IN
DIRECT
FROM PARIS

THE
SPRING-SUMMER
HAUTE COUTURE
AND TOP
READY-TO-WEAR
FASHIONS

A complete record of
the Paris showings

THE
NEW STYLES

THE NEW
COLORS

VOGUE

For orders call
FRENCH-VOGUE'S
SPECIAL PARIS-1980 ISSUE
1400 Broadway, Dept. F-80
New York, N.Y. 10018
Tel. (212) 512-2000

FLORA LEWIS

(Continued from page 369)

DOE ARCHIVES

not so high as Tenerife in the Canary Islands, in the mountains north of Madrid, or the areas of Spain's uranium deposits. But the load remaining in the worked-out deposits includes some of the radioactive isotope Lead-210, like radium, a product of the natural decay of uranium.

The biggest worry of Palomares is still, as it always has been, about water. Even on that, misunderstanding and lack of information has caused trouble. The Americans, said Don Pedro, heard and wanted to give the village a present. They brought a desalinization plant from Wheelus Air Force Base in Libya after Col. el-Qaddafi came to power, and evicted the U.S. Air Force.

"They thought we needed potable water," Don Pedro said. "But every house here has its cistern, there's always enough for people to drink. It's irrigation water that makes all the difference. If they'd spent all that money instead on wells and capping springs up in the mountains and built a water-pipe for forty or fifty miles, it would have changed everything. As it was, the purification plant was complicated and kept needing parts that couldn't be found. It broke down years ago for lack of maintenance."

There is information, much of it published, though, in little-known scientific papers. In one of them, as it happened, Dr. Iranzo described the techniques for measuring contamination in the land in great detail, explaining briefly that there was no need to keep checking the water supply because local people "can't drink it, it's too saline."

Among the major findings of the continuing tests has been that neither plants nor animals absorb plutonium into their lifecycle. Levels of contamination indicate clearly that they get it externally, from the air and soil. "Project Indalo," a joint Spanish-American continuing study, has set as its aims the measurement of uptake and excretion of plutonium by the population, re-suspension of plutonium in the air over the years, the internal and external contamination of agricultural products, and the migration of plutonium in the soil.

"We didn't see anything in the people to worry us," said Dr. Iranzo, who made the initial quick decision against evacuating the people after the accident and considers that events have proven him right. "The results look fine. In another year or two, we'll publish and maybe in about five more years the project can be completed."

The actual work is done by the Spanish agency, but the U.S. provides the most advanced equipment, a yearly contribution that was about \$25,000 and has now inched up to \$50,000, and consultations. Bruce Wachhold, Ph.D., at the Department of Energy, and Dr. Phillip Dean, of the Lawrence-Livermore laboratory, keep in touch with the Spanish officials and are urging an increase in U.S. funding to improve the study.

An official but unpublished American report on "Project Indalo" made in the spring of 1978 is discreetly and subtly devastating. It disclosed that the area where one of the broken bombs fell, on rocky land near the village cemetery, has developed an increased level of contamination. It was one of the areas where U.S. airmen turned and wetted

the uncultivated soil; but, in recent years, farmers seeking to expand their output have begun to use it.

"This has resulted in considerable resuspension of plutonium, contaminating not only the tomatoes grown in area 2, but also grain crops (barley and corn) grown as much as one-half mile downwind."

The report calls for a "major reevaluation of 'Project Indalo' and of the U.S. contribution and role in it." Among the reasons given:

"There is a large backlog of environmental samples resulting in delays of a year or more between the time a sample is taken and the time it is analyzed for plutonium." Detection of "potential problems" should be made "as they arise, rather than up to a year later."

"Some time ago, two of the four monitoring stations, one of which was strategically located with respect to the newly cultivated areas, ceased to function. These should be replaced. In addition, examination of native and domestic fauna, as well as flora, may be useful."

In the area that is showing renewed concentrations of plutonium, "it may be necessary to consider additional decontamination alternatives."

"A more intensive and controlled monitoring program" of the local population "is needed. . . . Because of social and community sensitivities, this activity has not been as organized or controlled as it could be. Virtually all of these problems recently have been resolved, but no unequivocal data exist as to the level of contamination, if any, within the residents of Palomares." (Italics added.)

The report suggests, somewhat obliquely, that there are political reasons why the U.S. should accept "the need for increased surveillance of both the environment and the people in areas contaminated by plutonium from U.S. weapons." Rising public concern at home, with the Rocky Flats, Colorado, case going to court, the delicate issue of returning the population of Eniwetok atoll where bomb tests were made a generation ago, suits by workers in U.S. factories, is one side of the problem; and the change of government in Spain with new freedom of expression and democratic openness is the other. The report notes that it "increases the likelihood that 'Project Indalo' will at some time be closely examined."

Dr. Iranzo, who said flatly that "we think what we did is fine and what we are doing is fine," also noted that "we know more about the effects of biological radiation than about any other toxics, about dosage and contamination levels. We do not have such safety standards for any other contaminants."

That may be true, though it is equally true that no antidote is known for plutonium poisoning and 24,400 years is a long time to wait for a lethal substance to decay. And the people of Palomares still don't know what, if anything, has been found in the carefully collected samples of urine or in the records of their whole-body counts, or that a part of their farmland is once again releasing plutonium in the air but it isn't even being regularly measured.

Like the rest of the world, they are managing to live with the dangers unleashed upon them. They are not resentful, though nagging fears persist: Fourteen years later, the effect of the accident is still something of a mystery. The nuclear age can arrive abruptly in a community, but it lingers far beyond the human scale of time. ▽