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## 1962 MEDICAL MISSION TO THE MARSHALLS

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### 20 MEGATON EXPLOSION

ON March 1, 1954, a thermonuclear weapon was detonated on Bikini Atoll in the Marshall Islands. This explosion, in the 20 megaton range, yielded a force 1000 times greater than that of the atomic bomb which devastated Hiroshima. Due to an unexpected shift in the prevailing winds, the radioactive debris, gouged out of the atoll by the fireball, drifted eastward in a great cigar-shaped cloud. Passing over the northeastern atolls of the Marshall group, an intensely radioactive fallout was deposited as a visible dust-like material. Fortunately, the most heavily contaminated northern atolls were unoccupied. However, on the atolls of Alinginae, Rongelap and Rongerik, lying from 70 to 100 miles east of Bikini, and on the southern fringe of the radioactive cloud, there were 82 natives and 28 American service men. The 64 people on Rongelap were the most heavily radiated and during approximately 48 hours before evacuation received an estimated total body dose of 175r from gamma emitting fallout. In addition, the dust-like material settled on the skin and in the hair causing superficial burns due to beta radiation. On Rongerik Atoll, a group of 28 American service men and on Alinginae, 18 natives received estimated gamma radiation of 78r and 69r respectively before evacuation and decontamination. Further east, on Utirik Atoll 300 miles from Bikini, 157 Marshallese received approximately 14r but by the time the radioactive cloud reached Utirik, much of the fallout had been dissipated. In this population there were no burns due to beta radiation of the skin.

medical facilities were available. Within a few days, teams of experts from the Naval Medical Research Institute and the U. S. Naval Radiological Defense Laboratory were quickly organized and flown out to the Marshalls. Under their supervision extensive studies were carried out on the exposed groups. In addition to detailed medical observations and laboratory tests, the amount and characteristics of the radioactivity were investigated. In these studies AEC laboratories and other agencies were employed in collection of data on internal contamination and other technical aspects of the problem.

Following several months of observation, the Utirik natives were allowed to go back to their island. However, Rongelap Atoll remained highly radioactive, and these people were moved to a temporary village on Majuro Island. In 1957 Rongelap Atoll was considered safe for habitation and the Rongelap people were transported back to their island where a new village had been constructed. Since 1954 under the sponsorship of the AEC and various government agencies and with the assistance of a group of professional and technical consultants, annual surveys have been carried out on the Marshallese. The results of these investigations have been published in a series of comprehensive reports, the first in 1956 entitled "Some Effects of Ionizing Radiation on Human Beings" and edited by E. P. Cronkite, V. P. Bond and C. L. Dunham. Subsequent reports, the latest entitled "Medical Survey of Rongelap People Seven Years After Exposure to Fallout," covering the 1961 survey, have been issued from the Brookhaven National Laboratory by R. A. Conard and his co-workers.

### STUDIES

Within 24 to 72 hours all the exposed individuals were evacuated, either by plane or ship, to Kwajalein where U. S. Navy

### 8TH ANNUAL SURVEY

On the occasion of the 8th Annual Medical Survey of the Rongelap people, I was

REPOSITORY BNL-Beacons  
COLLECTION Marshall Island  
BOX NO. MTMD Dept. Office (5-134)  
FOLDER NA

Tufts Medical Alumni Bulletin

The Medical Research Center

Brookhaven National Laboratory

Upton, L. I., New York

5012170



Leprosy patient comes to Uthai Leprosy Clinic on his Elephant.

with the deadly sea snake whose bite means almost certain death. Though fishermen are constantly sorting these snakes from their daily catch, surprisingly few victims appear for treatment. The same is true of the cobra, krait, and Russell's viper which are numerous but infrequently encountered on the beaten path.

### "BOMO"

Among the Muslims the local medicine-man or "bomo" practices folk medicine and some witchcraft too. The Saiburi doctors (3) were on good terms with one bomo who brought all his difficult cases to the hospital for treatment, escorting his patients into the examining room and on to the treatment room.

### GENERAL CONDITIONS

While 7 weeks were spent in central Thailand only 2 were spent in the South. As I reflected upon the general conditions of the country before leaving, it was apparent that the Thai were a contented people. They have sufficient food and adequate shelter though the standard of life and prosperity is far behind our own. Though the food supply is adequate the basic dish is polished rice; consequently in a land of abundant food avitaminosis still is common. In sanitation a great service was done Thailand during the Japanese occupation, for they insisted on the installation of septic tanks which improved sanitary conditions considerably. Economically the exports of teak

wood and rice bring stability to the country though it has only begun to industrialize.

### INDIA

I travelled to Japan, Taiwan, Hong Kong, Singapore, Malaya and Indonesia.

From Indonesia I went to India and saw Banares, the "holy city", where Hindus make their pilgrimages to bath in the Ganges, and where Buddha preached his first sermon. On sidewalks and streets among the crowds the sacred cows moved undisturbed. An occasional camel slowly carried his burden of grain along the street and everywhere people were peddling bicycles.

Leaving the temples and Hindu pilgrims behind I flew to Kathmandu, Nepal surrounded by the lower slopes of the Himalaya Mountains at an altitude of 4,400 feet above sea level. The quaint life of Nepal has not been disturbed much by the outside world and along the streets the mountain people come and go carrying their heavy load of produce on their backs for sale in the markets. The grass-roofed houses, the palace square of an old Mulla kingdom, and the characteristics of these friendly mountain people all made Nepal one of the more fascinating stops of the summer.

Returning to India I visited with Dr. Edwin Brown, a former professor in the Tufts Preventive Medicine Dept. and now a visiting professor at a medical school in Hyderabad. From India, the stops were few and brief before returning to my fourth year at Tufts.

### CONCLUSION

From the experience of the summer, my own perspective of the medical needs of Asia has greatly expanded and as I prepare to serve as a medical missionary it will be with renewed zeal and deeper insight into the practical skills required for remote medical practice.

One cannot see the masses and needs of the East and remain unmoved. These millions for whose loyalties the great powers are struggling present a medical challenge of giant proportions. Perhaps, there will be some from our own generation who will take a second look and meet the challenge.



The A. E. C. Medical Survey Team on the Shore of Rongelap. Dr. Moloney is 3rd from left in front. Dr. W. Sutow was not present.

invited to participate in the role of *medical and hematological consultant*. The ground work for the trip was prepared by a preliminary visit by Dr. Conard in November, 1961, to the Marshall Islands. Detailed arrangements were worked out before hand including permission from the Trust Territory officials, acquiescence of the natives for the examinations and arrangements for logistic support as well as air and ship transportation by the U. S. Navy and the Trust Territory. In December 1961 and January, 1962, meetings were held at Brookhaven National Laboratory where details of the schedule and problems of supplies and equipment were discussed by the members of the expedition. The team consisted of five U. S. physicians, an eye specialist, pediatrician, pathologist, internist-hematologist and the director, Dr. Conard. Three laboratory technicians and one electronics expert from the U. S. made up the technical staff. Most of the equipment and supplies were sent out by ship to Kwajalein and on February 18, 1962, the party took off from Idlewild Airport and flew via San Francisco to Honolulu.

After an uneventful trip, several days were spent in Honolulu clearing the party and equipment through Navy channels since we were under the logistic support of the U.S.N. Pacific Missile Range. On Feb-

ruary 20, 1962, we flew from Hickam Air Force Base via M.A.T.S. Constellation to Kwajalein Island stopping on Johnson Island early in the morning for refueling. There, in anticipation of the coming high altitude tests, rather strict security measures were in force and resulted in an uncomfortable wait, standing out in the dark and windswept air field in mid-Pacific.

#### KWAJALEIN

The approach to Kwajalein on the morning of February 20 was a strange experience. *Having crossed the International Date Line, we lost a day.* After flying over the vast and empty ocean, there finally emerged in the distance a group of low-lying islands surrounded by a long reef marked by the breaking surf. The lagoon side of the atoll was outlined by stretches of white sand rimming the smoother water and reaching up to the green vegetation. However, as the plane swept lower for the landing, instead of the expected tropical vista, collections of oddly shaped, gleamingly white windowless structures materialized on Kwajalein. The outlying atolls supported similar but smaller buildings. These were the minarets and mosques dedicated to the strange new cult of missiles, radar and space. Speeding down the runway which spanned the entire width of the island the

plane flashed closely past the intricate complex of radar, computer and control stations of the missile pad which could be seen extending further out into the lagoon. After a security briefing we proceeded with our hand baggage across the street to our quarters. We had arrived on Kwajalein, the base of our operations for the next five weeks and the source of vital stores and equipment for our trips to Rongelap and other islands.

Kwajalein Atoll, the largest in the world, lies in mid-Pacific about 2400 miles west of Honolulu. It consists of a reef dotted with nearly 100 small coral islands, surrounding a lagoon which is 66 miles long and 20 miles wide. Kwajalein Island, 2½ miles long and less than one-half mile wide, is the largest in the atoll and occupies the southern end of the lagoon. During World War II this was an important and heavily defended Japanese air and sea base. In February 1944, it was the scene of a bitter struggle which ended with the complete devastation of the island and the annihilation of the Japanese defenders by the U. S. Navy and the U. S. 7th Army Division. Now Kwajalein was a beehive of activity with Navy, Army, Air Force as well as civilian space and missile personnel crowding the relatively small island. Facilities were typically of a military character with the post exchange, barracks, mess halls and clubs for officers and other ranks.

#### **EBEYE**

Following the thermonuclear explosion in 1954, many Marshallese were relocated and some Rongelap people remained on Ebeye, an islet a few miles away from Kwajalein. These individuals, along with other displaced natives, were employed on Kwajalein in the laundries, clubs, barber shops, and numerous other facilities necessary for such an operation. Therefore, during the last week of February, examinations, laboratory studies and chest x-rays were obtained on exposed individuals and a group of unexposed controls, matched by age and sex. Histories were obtained by the English-speaking Marshallese practitioners, and I carried out most of the physical examinations.

#### **STUDIES AT KWAJALEIN HOSPITAL**

The Kwajalein Hospital, formerly a Naval Station Hospital but now maintained by the civilian agencies engaged in the missile program, placed examining rooms and other facilities at our disposal. This greatly aided the program and enabled us to perform fairly complete examinations; including an ophthalmological study, physical examinations with rectal and pelvic examination, Pap smear and chest x-ray. Routine laboratory work consisted of hemoglobin, hematocrit, red cell, white cell and platelet counts as well as reticulocytes and differentials. Various other studies were carried out including serum proteins, B12 and folic acid levels. Serum was also obtained and preserved in a frozen state for other determinations. Individuals who had received radiation burns were of special concern, and these cases were re-examined by Dr. Conard and photographs taken. Actually only the slightest residual scars could be found, even in the most severely burned cases.

#### **NATIVES**

The natives proved to be a very pleasant and cooperative people. Of Micronesian stock, most Marshallese are dark skinned, of slight build and with regular Caucasian features. In spite of an extremely low per capita income which permits only the poorest living quarters and a restricted diet, the people were a relatively healthy and happy lot. Few native customs survive and since the war and the development of the missile bases many Marshallese find employment on Kwajalein and have developed a taste for American food, clothing and our way of life.

On Ebeye the Trust Territory has been trying to improve the miserable living conditions of the natives. A new hospital had just been completed and while small and modest by our standards, it represented a great addition to the welfare of the Marshallese on Ebeye. Other natives recently dispossessed because of the use of atolls for the missile range, have also been settled on Ebeye. A visit to this tiny island proved to be a depressing experience. The crowded squalid huts, poor sanitary conditions, in-



The main street on Rongelap Island. There are no paved roads or vehicles.

adequate schools and other facilities were in shocking contrast to the new missile installations.

Later, on trips to Majuro, Rongelap and Ponape, it was evident that the way of life of most of the 18,000 natives populating the Marshall Islands has been completely altered by a series of events over which they had no control. First occurred the Japanese occupation and the savage conflicts of World War II which practically destroyed several of the largest islands. Then the thermonuclear tests on Eneiwetok and Bikini with the subsequent fallout problem. Now the advent of the missile range and the feverish activities of thousands of military and space personnel has created new and even greater difficulties. The Trust Territory officials are well aware of the problems and are struggling manfully to improve conditions. Fundamental projects involving medical care, schools, teachers and agricultural instruction are in progress but are greatly handicapped by grossly inadequate funds.

#### MAJURO

Following the examinations on Kwajalein, the schedule called for a visit to the island of Majuro. On February 28 the survey team was flown to this island about 200 miles southeast of Kwajalein. Majuro Atoll, the most southern of the Marshalls, is composed of the usual lagoon surrounded by

numerous islets strung around on the protecting reef. The island of Majuro is located on the southern side; it possesses an excellent harbor and an airfield had been built on it during the war.

Majuro was a Japanese possession but was not defended during the war, and so the occupation of the island was relatively peaceful and Majuro became an important advanced naval and air base for subsequent operations supporting the progress of American forces toward the Japanese home islands. Because of its southerly position, Majuro Island presented a more tropical picture than the sandy islands of the northern Marshalls. Landing on the old military air strip in the Navy amphibious plane, the island appeared green and verdant with tall, waving palm trees. The headquarters of the Trust Territory was located on Majuro and the only other U. S. installation was a Coast Guard weather station.

Utilizing several of the old Nissen huts which served as the *Majuro Hospital*, examinations on about 30 adults and children were carried out. Some of these natives had remained on Majuro after their evacuation from Rongelap in 1954. The examinations were carried out over a two-day period and on March 3rd we flew back to Kwajalein.

On the following Monday, March 5, we boarded the 500-ton cargo ship, the *Ron Annim*, a ship engaged by the Trust Territory to travel around to the various atolls carrying supplies, equipment and passengers. The ship also picked up copra collected by the natives which constituted the principal source of income for the Marshallese. Also on board were our medical and other supplies and equipment, along with 50 barrels of water and 8 of gasoline.

The *Ron Annim* was a very crowded ship and after we left the protection of the island and proceeded out into the Pacific, things began to get rough. However, most of us were good sailors and by mid-morning the next day Rongelap Atoll was sighted. Navigating the ship through the Pass into Rongelap Lagoon was a tricky business and the dark-blue shadows of coral heads indicated trouble if the ship strayed off course. But Captain Don Davis was an expert skipper

and as we proceeded through the calm blue waters of the lagoon the long curving white shore line of Rongelap Island with the waving palm trees made a pretty picture.

### RONGELAP

As we approached closer to the shore natives began to gather on the beach, and in the center of the long narrow island, the metallic roofs of huts used for dwellings and a few larger huts of the village school, dispensary, council house and church could be made out. After the fallout episode, when the radioactivity on the island had greatly diminished, all the native huts were burned and in their place the AEC provided each family with an individual hut made of wood, elevated about 4 feet from the ground and having a corrugated tin roof. From the roof, gutters led to drain pipes which in turn emptied into cement cisterns, built as part of the new accommodations. Since there are no springs, wells or streams, collection of rain is the only available source of water on the atolls. The larger village buildings also had this arrangement and the water so collected was used for communal washing, the women sitting around in a circle, chatting and washing out garments. The huts were devoid of furnishings except for a few mats and boxes containing household utensils. Cooking was done over an open fire in the yard, and children and adults gathered under the huts, sleeping there on mats made up of woven palm leaves.

The Ron Annim anchored about 500 yards off shore and since there was no wharf or dock, all the supplies and equipment had to be brought ashore in a small open launch and two small boats powered by out-board motors. The ship winch swung the heavy items such as the deep freezes and refrigerators, over to the launch in a cargo net. Also unloaded in this manner were the huge roll of canvas for the tent, along with lumber and cement blocks, laboratory equipment including a Coulter Counter, microscopes, centrifuges and all the paraphernalia needed for living, eating and working on the island.

Unloading the ship and carrying the supplies and equipment to the camping site and to the huts in the village took nearly all day

and everyone pitched in and worked like stevedores. Meanwhile, carpenters flown in from Kwajalein built a floor and erected the frame for our tent putting the canvas over it, no slight job. There were ten camp cots with mattresses and the tent was pitched in a small grove of palm trees overlooking the sandy beach of the lagoon. Nearby a large, empty hut rented from the Marshallese, served as a joint cookhouse, dining hall and ward room. The Marshallese practitioners slept in the dispensary and school hut; we all ate together in the mess hut. Fortunately on Majuro, Bob Conard had been able to hire an excellent English-speaking cook. Salvadore was a tremendous addition to the party and kept us well fed. We were lucky also in acquiring another very useful member for the trip, the 17-year-old son of the District Commissioner, Skippy Coleman, on vacation from college in New Zealand. He came along as mess boy and general helper and proved to be an unusually interesting and intelligent young man.

### STAFF

*The working area* consisted of several large huts in the village. The Council House was cleared of benches and utilized as the administrative headquarters, x-ray department and for certain laboratory tests. The day following our arrival, Dr. Watrou Sutow, a pediatrician from the M.D. Anderson Hospital in Houston, was flown in by the Navy. The plane landed in the lagoon, taxied to its mooring and Wat came ashore with his luggage in the small rubber boat. Dr. Sutow was an old and very good friend. He had been in Hiroshima working with the Atomic Bomb Casualty Commission during the two years I spent there, and I knew him and his family very well. Wat had been out on several prior surveys and since he was an expert on child growth and development as well as an excellent all-around pediatrician, he was a great addition to the team. The pediatric and adult examinations were carried out in a large hut used as the school house. Interviews and histories were taken in the front part of the building and the rear and middle-third of the hut were



The company-type tent used for sleeping quarters on Rongelap.

fixed up as pediatric and adult medical units. Ezra Riklow and another native practitioner obtained the histories and acted as interpreters. Dr. Alfred Hitching, a Gilbertese, had joined us on Majuro where he was stationed, working for the Trust Territory. He was a very intelligent fellow, and the first native physician to join a survey as a member of the medical team.

#### EXAMINATIONS ON RONGELAP

On Rongelap the schedule called for the examination of about 240 Marshallese, including exposed adults and children, children born to exposed parents and a comparison population of unexposed natives who had returned to Rongelap after 1957. After a preliminary interview each person was given a check sheet and routed through either the pediatric or adult medical unit. Dr. Hitching and I each had a cubicle, and we carried out the examinations, writing up our findings as we finished each case. Records of prior examinations were available and the results were compared and any new abnormalities noted. The laboratory was established in the rear half of the dispensary hut, a hot and uncomfortable situation. The variety and large numbers of laboratory tests posed special problems for Dr. Leo Meyer, pathologist and chief of the laboratory, and a veteran of nearly all the prior medical surveys. Occupying the front half of the dispensary hut, Colonel Austin Lowrey, our ophthalmologist from Walter Reed

Hospital, set up his slit lamp along with other equipment for eye examinations. Dr. Lowrey was experienced in native eye problems and on this trip he conducted special studies on the lens for the detection of radiation cataracts.

The schedule called for examinations on about 15 children and 8 adults a day. However, not all the natives could come to the village and a number of very old or crippled individuals had to have "home" visits. Since there were no vehicles, and for that matter no roads on Rongelap, some afternoons were spent in hiking to isolated huts to examine older people.

*Other expeditions* were carried out by traveling in a very small boat powered by an outboard motor on loan from the Trust Territory. Dr. Ezra, Dr. Hitching and myself set off to visit one old lady, said to be 101 years old. She lived at the extreme end of the island about 5 miles from the village. We carefully wrapped our medical and laboratory supplies in a plastic-covered box and set out down the lagoon. Before we could get the boat fairly launched a large wave swamped us, and we had to bail out the boat and rescue our plastic-covered box of equipment. Since we wore only shirts, shorts and sneakers, no great harm was done, and we started out again, rather wet but undismayed. This time we managed to get off shore and following a rather "roller coaster" type trip, we made our destination safely. *The very old, toothless lady lived under her hut, and we crawled in under to examine her and obtain the laboratory specimens.* The flies, always a nuisance, were thicker than usual, but things became even more complicated and crowded with the arrival of a variety of scratching chickens followed by several small curious pigs.

#### ENIAETOK

The trip back was comparatively dry and uneventful since the wind had calmed down during the morning. Several days later a larger expedition consisting of Dr. Ezra, Hitching, Bob Conard, Austin Lowrey, Bill Scott and myself set out in a dory-like boat to visit the small islet of Eniaetok, where there were some 14 elderly Marshallese, a

number of them in the exposed group. The boat was loaded pretty well down to the water line and as we set out to cross the lagoon the early morning tide rushing through the passes into the lagoon caused a very turbulent and rough cross-chop. While it was of some comfort that we were rarely more than a few hundred yards from coral reefs and sandy beaches, the waves splashing over us made the outgoing trip rather miserable, and the fear of swamping with the possibility of encountering a shark or barracuda was not a very comforting thought. However, we arrived safe but very wet and set out hiking around to visit the old and feeble natives residing on this isolated spot. It took all day to conduct the examinations and collect the specimens. However, since the wind had died down and the tide was not running, the trip back was uneventful and dry.

#### STUDIES ON SCHEDULE

Our studies were concluded on schedule but not before a *generator failure nearly cost us dearly*. On Rongelap there was no electricity and a mobile generator had been sent out by the Navy. It was supposedly in good working condition and since it supplied all our electrical equipment, including deep freeze and refrigerators where we stored our specimens and our food, it was a vital piece of equipment. The Ron Annim had sailed away although we were in touch with her by radio, also with Kwajalein. Doug Clareus, our very capable electronics expert, had done a great job in the electrical department. However, 48 hours after the ship had sailed the generator motor began to skip and before long it cut out altogether. Doug managed to get off a radio message before the power failed completely but try as he could, the generator motor would not function. Fortunately the Ron Annim had received our message and relayed it on to Kwajalein. The next morning, just as we were *despairing* of saving our perishable food supply and specimens, a Navy amphibious plane circled over the island and landed in the lagoon. On board were two generator repairmen and extra parts. The generator was finally fixed and a stand-by

generator flown in. We had no more trouble for the rest of our stay on Rongelap.

*The Marshallese were very cooperative* on this visit and only one individual refused the examination. On prior surveys the team lived on board ship but living on shore in the tent was more comfortable and afforded a much better and closer association with the natives. On March 22nd the Ron Annim returned to the lagoon and after taking down the tent and packing up the equipment, we reloaded and sailed back to Kwajalein. On our way to Kwajalein a radio message directed to Bob Conard on the ship requested that members of the survey team proceed to the Island of Ponape in the Carolines to examine a young Marshallese student who had been exposed to radiation on Rongelap. The Navy flew us to Ponape, a beautiful mountainous island about 400 miles west of Kwajalein in the direction of the New Guinea coast. It was an exciting landing in the reef-infested lagoon and the lush green and very tropical-looking island proved to be a delightful and interesting place. On Ponape the District Administrator of the Trust Territory, Maynard Neas, his assistant, Dr. J. Umholfer and his wife, were extremely kind and hospitable.

The following day we flew back to Kwajalein, meanwhile, the rest of the party visited Ebeye and finished up the examinations on a group of children and a few adults. The serum specimens were placed in dry ice for the air trip home, equipment was repacked for shipment by boat to the U. S. and on March 26th the party flew to Honolulu there team broke up and returned home.

#### RESULTS ARE BEING ANALYZED

The results of this survey are still being tabulated and analyzed; they will form the basis of another report prepared by Dr. Conard and his consultants. Undoubtedly *no gross abnormalities* will be found in these Marshallese and scars of beta burns have continued to fade. Depression of *white cells* and *platelets* noted earlier in the more heavily exposed natives, have long since returned to normal levels. However, on this survey for the first time *cytogenetic studies*

were carried out on cultures of peripheral blood leukocytes and on a limited number of bone marrow specimens.

Recent reports indicate that following radiation, morphological changes may be detected in the *chromosomes* of peripheral blood and bone marrow leukocytes, and these abnormalities may persist for years. Of great interest in this regard was a report on cytogenetic studies carried out on 6 men accidentally exposed to ionizing radiation in a reactor accident several years previously. While these people had returned to their usual state of health and blood findings were normal, nevertheless, when peripheral white cells were grown in culture for several days and the *mitotic division* stopped at metaphase with colchicine, chromosome abnormalities could be detected in most of these individuals. This important observation, that radiation may produce detectable chromosomal changes which may last for many years, had been previously reported by British investigators working with patients suffering from spondylitis who had received heavy doses of therapeutic x-rays. Therefore, it was of interest to note if similar changes had been produced and were persisting 8 years following a moderately severe total body dose of fallout radiation in normal adults and children. About sixty peripheral blood cell cultures were obtained on Rongelap natives. Unfortunately, due to the adverse conditions and high humidity many of the chromosome preparations spread poorly and failed to stain properly. However, 10 specimens proved to be adequate for limited study and in three individuals *chromosomal changes* indicative of a radiation effect were noted.

#### CONCLUSION

The six weeks were well spent, and while no apparent gross damage has been discovered in either the exposed Marshallese or their children, with the development of more sensitive and specialized techniques, especially those designed to detect chromosome changes in the cells of the bone marrow and peripheral blood, this exposed population offers a unique opportunity for cytogenetic investigation of the long-term effects of fallout radiation in man.

November, 1962



Dr. Shah, left, and Afghanistan Ambassador M. H. Maiwandwal

#### AURANG SHAH, M'34, HONORED

Dr. Aurang Shah, M'34, 719—K Street, Sacramento, Cal., lifelong minister without portfolio for his native Pakhtunistan, received recognition on April 19, 1962 for his effort to obtain full independence for the mountain people called the Pakhtuns. The Afganistan ambassador to the United States, M. H. Maiwandwal, conferred his country's highest non military decoration, the Stor (star), second degree, upon Dr. Shah during a banquet in the Hotel Senator attended by 180 of Dr. Shah's friends, civic leaders and public officials.

Ambassador Maiwandwal said the Pakhtuns are part of a tide in which foreign dominated peoples are seeking self determination and full independence. Afghanistan and Pakistan have disputed the boundaries of the area which Dr. Shah claims historically has been known as Pakhtunistan, although the area is not recognized formally by other governments. Dr. Shah's lifelong mission has been to seek recognition by foreign governments and the United Nations of the state of Pakhtunistan and its boundaries.

**DON S. KNOWLTON, M'21,  
AN EMINENT ALUMNUS**

**D**ON S. KNOWLTON has had a distinguished and colorful career. Born in Fairfield, Me., he attended Colby College, Yale University and Tufts Medical School from which he graduated in 1921. After graduation, he interned at the Cambridge Hospital and the Yale-New Haven Hospital and then had residences at the Syracuse University Hospital and the Episcopal Hospital in Washington, D. C. His specialty is otolaryngology which he practices in the Columbia Medical Building in Washington, D. C.

*Service to Country*

Earlier in his career he served with the American Expeditionary Forces in France from 1918-19 during World War I. He was on active duty in 1940 with the U. S. Marines in Quantico, Va. During World War II, he was assistant division surgeon of the 1st Marine Division and the Marine forces in the seizure and occupation of Guadalcanal in 1942-43. He was the surgeon at Camp Lejeune in N. C. from 1943-44, division surgeon of the 6th Marine Division FMF from 1944-45 with which he served in the battle of Okinawa-Shima. Then he was on occupation duty in North China and was promoted to the rank of Commodore in 1945. From 1945-46 he served in the Navy Department in Washington, D. C., and finally retired as Rear Admiral in 1950 after over 34 years of service.

*Honors*

He was the recipient of many honors including the Presidential Unit Citation with 3 stars, Legion of Merit with Combat V for Guadalcanal, Commendations from the Sec. of the Navy, Legion of Merit with Combat V for Okinawa, Navy Unit Citation, Purple Heart, Asiatic-Pacific Medal with 3 stars, China Expeditionary Medal, Victory Medal World War I with stars, Naval Reserve Medal, Marine Reserve Medal, Pre-Pearl Harbor Medal and others.

*Medical Activities*

He is a member of many medical and professional organizations including the

American College of Surgeons, American Academy of Ophthalmology and Otolaryngology, the American Board of Otolaryngology, and a Life Member of the Southern Medical Association.

Dr. Knowlton is Associate Professor of Otolaryngology at Georgetown U. Medical School and is consultant to the George Washington Hospital, Mt. Alto Hospital, and the Doctors Hospital, as well as others. At present he is Medical Director of the General Services Life Insurance Company of Washington, as well as being a member of its Executive Committee and one of its Directors. In addition, he is in private practice.

**MEDAL TO CARRIE CHAPMAN, M'34**

Carrie E. Chapman, M'34, chief of physical medicine and rehabilitation at the VA Hospital, Oakland, Calif., and a fellow in physical medicine and rehabilitation in the Mayo Foundation from 1946 to 1949, on assignment from the United States Public Health Service, received the bronze medal of the American Congress of Physical Medicine and Rehabilitation at its annual meeting in New York City August 26 to 31, 1962 for her 13-year study, "Atraumatic Hydrotherapeutic Debridement of Severely Burned Patients." She was also elected president of the American Institute of Ultrasonics in Medicine for 1962-1963.

Born in New Hampshire, she was a medical officer with the United States Public Health Service from 1944 to 1949. After she left Rochester, Minn. in 1949, she joined the Medical Corps of the United States Navy, reaching the grade of Commander. She has practiced at the Oakland Veterans Administration Hospital since 1954.

**COUNTWAY LIBRARY**

(Continued from Page 15)

terial culture so rapidly as to threaten to smother itself.

In 1931, Thomas Edison said "we don't know one millionth of one per cent about anything."

If this be true of the medical sciences it is well that we have prepared, as best we can, to capture and control the expanding knowledge that already is flooding upon us.