



Dr. Selman A. Waksman, who will receive the Nobel prize for his work in the discovery of streptomycin, working in his laboratory.

Waksman and 10,000 Microbes

It was from them that streptomycin came, and it brought Nobel honor to the modest Rutgers microbiologist.

By HARRY GILROY

NEW BRUNSWICK, N. J. DR. SELMAN ABRAHAM WAKSMAN, the Rutgers microbiologist who will receive next month the Nobel prize for medicine and physiology, was in his laboratory last weekend when a visitor called for a talk. The laboratory is in a red-brick, Georgian-style building on the university's College of Agriculture campus, a setting of lawns, groves of trees, model farm fields and baronial school buildings which could pass for an old ducal estate more plausibly than for an important center of research. That is the outer view, but in the building a visitor can see from signs on the doors what goes on—"Soil Testing," "Weed Control" and the like. On the third floor a door is marked, "327—S. A. Waksman."

This is the office of the man honored all over the world for his work in the discovery of streptomycin, "the first effective antibiotic found for use

HARRY GILROY of The Times Magazine came away from a visit with Dr. Waksman newly impressed by his work and also with Rutgers, from which Mr. Gilroy graduated.

against tuberculosis," in the words of the Nobel citation. It was in the office that Dr. Waksman, coming from the laboratory across the hall, received his visitor. The scientist wore a white smock which had holes in both elbows. "This is a disgrace to my secretary, my wife and the university," he said. "However, it serves the purpose." There were other signs that the scientist was not fussy about non-scientific things—his silvery hair curled slightly over his collar, and when he replaced the smock with a gray suit coat, that had a spray of stains across it. But there was an alertness of glance and a humorous turn of mouth, under a black-and-gray dappled mustache, that would forever bar him from playing the role of absent-minded professor.

Dr. Waksman began to talk about the problem of any scientist who has done a creditable piece of work. "He is in danger of becoming high hat," said this scientist. "For many years I have been collecting books of cartoons about scientists. Caricatures of how he takes himself, and how the world looks at him, I can just see what must have

happened to some scientists when people suddenly started telling them that they were great men. It is a dangerous thing if they don't view it with a sense of humor. I don't see how they could ever work again."

ON the scientist's steel desk were several incoming and outgoing messages connected with the Nobel prize arrangements. He explained what they were and glanced at a couple. "This prize came without advance notice," he said, almost as if that were surprising. "I have previously agreed to go to Tokyo and speak there Dec. 20. I'll leave New York by plane on Dec. 4, stay in Stockholm through Dec. 10, when the Nobel celebration occurs, fly to Japan for that address and to San Francisco for a January speech. It is a small world."

A secretary brought in a batch of telegrams, fastened together with an elastic. "All right," said Dr. Waksman, "then I have something for you." He handed over a typescript and asked if the girl would have another secretary make some corrections, a request that

led a little later to a minor revelation about the scientist's character. At the moment the telegrams occupied him—he read off names of universities all over the world, scientists, philanthropists, and then he said: "This is important." It was a congratulatory message from patients in a Swedish sanatorium.

DR. WAKSMAN laughed with pleasure. "All sorts of invitations here. I could write a book on how to lecture your way across Europe. In 1946, you know, I gave what were probably the last lectures that any American has given in Moscow, three to the Academy of Sciences there and one in Leningrad. That was when there was hope for a more cordial atmosphere and the State Department approved of my going."

Asked if he had delivered the lectures in the Russian language, Dr. Waksman said he had. He pulled out a typed biographical sketch from his desk. "Here, take it," he said. "You'll see that I was born in Russia and went to the gymnasium there. I was 22 before I came to the United States." The sketch showed that Dr. Waksman was born July 2, 1888, in Priluka, a small town in the Ukraine.

"Conditions were very unpleasant in Russia," Dr. Waksman said. "It was the time of the czars. I wanted to study about the processes of life. So I sent my credentials to Zurich—I was even accepted there—but relatives who had emigrated to the United States told me to come here. There were great universities here, and I might want to stay after I studied. So I came to a cousin in New Jersey. I sent my credits to the College of Physicians and Surgeons at Columbia, but while I was waiting my cousin said that right near us was this little college where another Russian immigrant, Dr. Jacob Lipman—this building is named for him—had got to be the dean of the College of Agriculture. I talked with Dr. Lipman, and he suggested that maybe I could study the processes of life here as well as anywhere."

THE scientist pointed to the photograph of a distinguished-looking man on the wall. "That's Professor Halsted, a great man. Here they gave me a scholarship. I commuted from the farm where I lived with my cousin, and they would pay me twenty cents an hour to work in the laboratory. Dr. Halsted would have me come in Saturday and he'd talk by the hour with me—the American organization of research vis-a-vis the European, the large university vis-a-vis the small college, the professor and the student. Then at the end he would say 'If you don't report all this time as working time I'll never speak to you again.' He knew the seventy cents was dinner next day. That sort of treatment by such a man to a young student means a great deal."

Leading the way to an adjoining conference room, Dr. Waksman took some books from a shelf, a four-foot length of his own publications. "Look, here's the story. The Nobel prize is for medicine. I am a soil man. See my books—'Principles of Soil Microbiology', 'Humus'. Sure, that's where I learned about the processes of life. What I did learn, that is."

Dr. Waksman, whose role at the university is head (Continued on Page 58)

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(Continued from Preceding Page)
ture lies in the hands of our Fuehrer."

Thereafter he was officially retired, but not inactive. In December, 1938, he was said to have gone to London to persuade those interested in saving Germany's Jews that a "ransom" in the form of increased purchases of German goods might accomplish this end. He left his Reichsbank post in 1939 and began a series of strange secret missions to India, France and Britain, where, it was said, he spread whispers of the might of the Nazi military machine. By 1943 he was rumored to be Hitler's "contact man" in seeking out peace feelers from Anglo-American groups. A year after that he found himself in the concentration camp at Dachau, charged with participation in the July 20 bomb plot against Hitler. And, finally, he wound up in dock with the other German war criminals in Nuremberg. He survived all this and much more.

BUT in recent years he has had more than one reminder that he is not exactly beloved of much of mankind. In October, 1951, at Jakarta, Schacht, who was visiting Indonesia at the request of that government, was introduced, at a reception, to Dr. Hugh Keenleyside, Canadian director of the United Nations Technical Assistance Administration. When Schacht put out a hand, Keenleyside withdrew his and said: "I know your black record. I shall have nothing to do with you." Schacht left the reception to discover that the Canadian official had issued a statement in which he called him "an unprincipled turncoat," "a disgrace to the human race," and "a despicable scoundrel." Characteristically, Schacht issued his own statement, to the effect that only lack of dollar funds kept him from charging Keenleyside with slander.

There has been no end to his

planning and scheming, but he has had little success in having either the Allies or the present West German Government adopt any of his ideas. One factor in this has undoubtedly been a letter he is said to have received two and a half years ago from Chancellor Adenauer, in which Schacht was told flatly that Adenauer did not wish him to attempt to return to public life. This occurred despite a previous ingratiating statement made by Schacht to the effect that "We must be grateful to Dr. Adenauer for his initiative" in advocating the investment of American capital in German basic industries. In the course of that statement Schacht actually proposed that Western Germany be given an American loan of 2,000 million marks based upon the gold in Fort Knox for the revival of German industry.

WHILE the primary object of most of his field trips to other countries is usually announced as the surveying of financial conditions, several West German papers believe he is aiming both at the re-establishment of a strong German export, particularly in the Moslem world, and the establishment of his as-yet-unauthorized bank. How much he has learned in all these years is a moot question. He likes to answer it in this way:

His support of Hitler, he says, was "aimed at getting Germany's 7,000,000 jobless off the streets and not at financing German rearmament. For that, I have sacrificed my life." Elsewhere, he has said, with a sort of disingenuous helplessness: "I don't understand politics. My errors in the past are sufficient proof of that." The world has listened and generally remained skeptical. To it, Hjalmar Schacht is still either the quintessence of unscrupulous ambition or, what is less likely, the most misunderstood man of our time.



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Waksman and 10,000 Microbes

(Continued from Page 20)

of the Department of Microbiology as well as professor of the subject, had a tray of letters waiting for signature, so he led his visitor a little farther down the hall to a small library to wait for him. On a green blackboard at one end, in a Christmasy red-and-white, was the legend: "Congratulations on Your Choice, Nobel Prize Committee." The origin of this sign was explained by a dark, pretty librarian: "We had a torchlight parade when we heard the news. Everybody came out of the labs with candles and we called on Dr. Waksman. We brought him in here and had refreshments—no liquor on the campus, of course. I think he liked it."

THE Nobel prize winner reappeared shortly, wearing a brown topcoat and hat and carrying a briefcase. "I want to show you the Institute of Microbiology," he said. On the way along the hall a young woman came up to him with several typed sheets—and this was when the character revelation, mentioned earlier, took place. "Just leave that with my secretary," said Dr. Waksman, but then he apparently read disappointment in the girl's expression, "I better work on that over the weekend," he said, and put the papers into his briefcase. Afterward he said in an apologetic tone to his visitor, "You know, the laboratory people are ex-

ganisms live in the soil together. Does the battle for survival, Darwin sort of thing, go on there? What effect does one have on the other? Many of these organisms are the so-called actinomycetes—something between a higher bacteria and a lower fungus. They were so common, and so little attention had been paid to the study of them, that they were fairly begging to be studied. Well, I studied them and found that they exerted a tremendous injurious effect on the bacteria in the soil."

BY this time in the drive, Dr. Waksman had passed the center of the city and reached the part of Rutgers which developed first after its founding in 1766 as Queens College. "Look when we start up College Avenue," he said. In the distance, framed between the old trees of the street, appeared a white cupola. "The Institute of Microbiology," he announced. "Oh, I can tell you that when I first saw that new landmark at the end of College Avenue it was a great thrill for me. The institute is being built with the royalties from streptomycin, assigned to the university. More than \$3,000,000 has been spent so far."

After a few blocks he returned to the story of his work. "It is the story of the 10,000 microbes. We isolated 10,000 microbes and tested them for ability to inhibit the growth of pathogenic bacteria. We found that 10 per cent had that quality. We tried to grow that thousand microbes in cultures and found that 10 per cent lent themselves to the process. From that hundred we tried to extract the active substances, and we ended with ten chemical compounds. We tested them in animals and one is the antibiotic now known as streptomycin."

HAVING crossed the blue Raritan River, Dr. Waksman drove to the new campus of the university and stopped in front of the Institute of Microbiology, a four-story structure which carries on the red-brick Georgian style. "One of the wings is going to be a pilot plant so we can prepare our own drugs when we've developed something enough to standardize it," he said. "That will be a good thing. Well, there is the institute. It must be fitted out and a staff assembled before it opens. It could be that it will do for microbiology what the Pasteur Institute has done for bacteriology. It all depends on the people who come here. You can fill it with jobholders easy enough. What we have to find is minds. There is a difference between the technician and the research mind. Give the technician a problem and he produces a solution, or he can't—and that is the end of

(Continued on Following Page)

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Dr. Waksman, left, with Sir Alexander Fleming, penicillin discoverer.

(Continued from Preceding Page) his work. Give the research mind a problem and in no time he has a dozen. And he knows what to do with them."

Dr. Waksman drove a mile around the campus and into a still unfinished driveway beside a brown-stained wooden house. It developed that this was the scientist's new home, and a black-haired, youthful looking woman who stood in the driveway was his wife. They had a brief, amiable disagreement about the angle of turn in the driveway, but Dr. Waksman said he sided with the builder, and that appeared to settle that. The house centered around a living room with a glass wall looking toward the Raritan—"It's modern but not modernistic," said Dr. Waksman, "very livable."

He motioned that he wanted company in the kitchen. "I'm thirsty," he said, and drew a half-filled green cocktail shaker from the icebox. He poured two drinks. "Taste it," he said. It tasted, suggested the visitor, like lemon and perhaps wild cherry and something fiery. Dr. Waksman shook his head. "Two parts rum—Barbados is best—one part lemon. And this is what threw you off—one part falernum, that is a sweetener used in the Caribbean islands. Consider what a cocktail is—a strong drink, lemon or lime, and a sweetener. We must always find practical applications for our knowledge. Have another." He poured another round and took one to his wife.

AFTER the Waksmans had discussed the day's haul of telegrams, the scientist drove his visitor to the railroad station. On the way out of his driveway he pointed to the house sign, "Villa Bobili." He explained that Bobili meant, in Russian, Little Grandmother, and that it was a pet name for his wife, who was born in the same Ukrainian town as he and married him in the United States in 1916.

"When you looked at the books in my office did you notice that one of mine called 'Microbial Associations and Antagonisms'?" he asked. "If you would look into it you

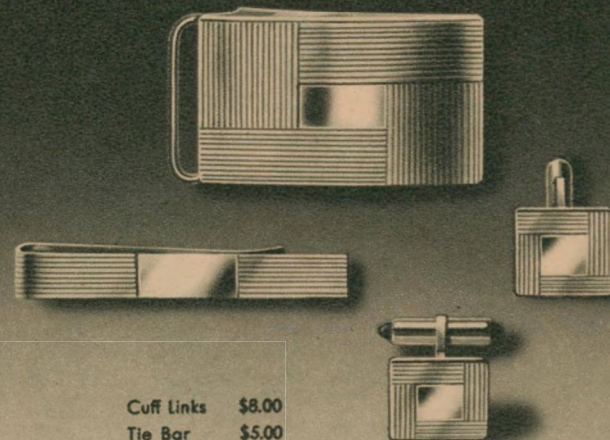
would find my dedication. It reads this way—'To my constant associate and antagonist, Bobili.' That's the way a wife should be. A man has to be told that not everything he does looks perfect to the rest of the world. A wife has to kind of expose you to reality every so often."

ON the way to the station Dr. Waksman began to talk about the future of science. "I think we're doing pretty good, in our organization, that is," he said. "But some people have the opinion—well, let me put it this way: last summer I was asked by a French writer if I agreed with the statement that all the great discoveries have already been made. That is nonsense. Nonsense! It reminds me of the professor who was at Rutgers when I first came here. He said we must pay no attention to the people who thought that one element might be changed to another. Now we have had the splitting of the atom. Elements are not only changed, new ones are made."

He thought this over and said, "Nonsense!" a couple of times. "What have we learned yet about life?" he asked. "We can analyze it and then what we have at the finish is dead. Someone has said that the last century in science has been the century of physics and the next will be the century of biology. That could be. Analyze the complexities of a piece of rock and then compare that with a piece of living tissue. I don't think we can say we are even at the threshold of discovery in that field. We are just beginning to approach it."

From science he turned to the state of mankind. "Why must men go on killing one another? There is so much to be done." He brought the car to a stop at the railroad station, and he looked fixedly across the station plaza as if preparing a scientific comment on his question. "It's depressing," he said, but he drove off with the cheerful look of a man who knew that there was still a lot of useful work for him to do in his laboratory.

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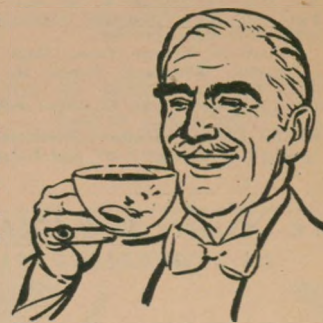
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