

with the mold and subsequently used for dressings on infected wounds.

Dr. Vogel adapted this method to one which could be carried out in the average home by anyone having only a rudimentary knowledge of sterile procedure. The bake oven of the kitchen stove, a glass coffee pot, and a tea cup are among the familiar pieces of equipment used in this process. (See *SNL*, Nov. 27)

Disadvantages of the method are: 1. The penicillin gauze can be used only between the ages of four and 12 days, the period during which the mold on the gauze is actively producing penicillin. The penicillin is in the crude state and is present in such small quantity that it cannot be refined and used intravenously for septicemia (blood poisoning) or pneumonia or for any infection that is not in or near the surface of the skin.

Syphilis, gonorrhea, pneumonia, staphylococcus infections such as acute and chronic osteomyelitis, cellulitis, carbuncles of the lip and face, empyema, infected wounds and burns, pneumonia and hemolytic streptococcus infections are all vulnerable to attack by the potent mold chemical which 19 drug, chemical and other manufacturing firms are now producing as speedily and in as large quantities as possible.

Penicillin is still a new word; the pronunciation which seems to be most prevalent places the accent on the penult (next to the last syllable). This would be the natural thing to do, in deriving the word from the generic name of the mold which is its source, *Penicillium*. A good rule-of-thumb, memory aid is to say it as a lisping child might try to say "penny-shilling"—"penny-sillin'."

Science News Letter, December 4, 1943

Do You Know?

Mahogany, formerly used in fine furniture, is now used to build light, speedy submarine chasers.

Most *animals* living in the wild are vegetarians, the bulk of their food being plants, seeds, fruits and berries.

Sweet potato meal may be used as a substitute for corn in cattle feeding; it is made from dehydrated *sweet potatoes*.

The *jerboa*, which looks and leaps like an eight-inch kangaroo, has excited the interest of American soldiers in North Africa.

The basking shark and the whale shark are the two biggest *fishes*; they are dull, sluggish monsters sometimes 50 feet in length.

Fighting *frigates* being built by the Maritime Commission are 306-foot boats for convoy escort duty; over 100 are under construction or already completed and in service.

Clothing after the war may be treated with a chemical now used by the Army to make it resist water, stains and spots; the chemical impregnates each fiber and is not lost in washing.

The American *soybean* crop this year will yield approximately 209,000,000 bushels, most of which, because of its high nutrient value, will go into human and stock food.

Boron was once thought by agricultural chemists to be a plant poison; now it is known that it must be present in soil in small quantities if plants are to grow properly.

The 1943-44 *wheat* crop in Australia, which will be harvested around New Year, is estimated at 89,000,000 bushels; this is 57% of last year's yield, and about 55% of the average yield for the past ten years.

Nearly \$100,000,000 worth of *gold* has been produced annually in recent years in Latin America, the greatest quantities coming from Mexico, Colombia, Chile, Peru, Brazil, Venezuela, Ecuador and Bolivia.

MEDICINE

\$5 Penicillin Factory

Physician who reported a new method for producing the valuable germ-fighter tells the story of how and why he started his own private mold culture.

► WITH AN INITIAL outlay of less than \$5 and at a production cost of less than five cents per petrie dishful, any doctor can manufacture penicillin, the germ-fighter from mold which money cannot buy.

These production cost figures come from Dr. Julius A. Vogel, of Aliquippa, Pa., who adapted for a kitchen production line (See *SNL*, Nov. 27) the method of producing crude penicillin on gauze dressings devised by Dr. George H. Robinson and Dr. James E. Wallace, of the Allegheny General Hospital, Pittsburgh. (See *SNL*, Oct. 23)

As soon as he read their report in a scientific publication, Dr. Vogel related at the Industrial Hygiene Foundation conference, the idea of growing his own penicillin intrigued him greatly. His evenings were free and producing penicillin at home promised both diversion and, if successful, the reward of having the precious medicine for his practice.

Remembering that he had saved from medical school days his platinum loop holder, an instrument used by bacteriologists for handling microorganisms of all kinds, Dr. Vogel first sought for and found it.

Next he telephoned Dr. Robinson who "very graciously consented" to pre-

sent him with a pure culture of his strain of the mold, *Penicillium notatum*.

"Without pausing to catch my breath, I immediately arranged to be relieved of my duties the next day," Dr. Vogel related. "Accordingly at 10:45 on the morning of the 12th (of October, four days after publication of the Robinson-Wallace report) I had safely tucked away in my vest pocket my culture of *Penicillium* which Dr. Robinson himself implanted upon the medium.

"With my precious cargo carefully protected, I secured from a surgical supply house five 75-millimeter petrie dishes, a length of platinum wire and a glass marking pencil. From my drug-gist I secured the ingredients for preparing the nutrient medium.

"On the evening of the 13th, with the mold grown sufficiently to be discernible on the surface of the medium in my test tube, I inoculated the petrie dishes and sat down to wait results. By the morning of the 18th the cultures were sufficiently mature to take them along with me and look for trouble—and in a plant employing 10,000 men it does not take long for trouble to appear. Thus was I embarked upon the course in which 'deep (Turn to next page.)

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leads to depth and depth to further depth.'

"Here I was, using penicillin which I myself had prepared without the facilities of a modern fully equipped laboratory at my disposal. The only

apparatus I had used was the usual equipment found in the average family kitchen of today."

Within the first three weeks he used it on 29 patients. In a few the results were disappointing, he reports, but many improved with "incredible" rapidity.

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EVOLUTION—SOCIOLOGY

Civilization Mutations

Leading biologist, in new book, sees revolutionary changes in progress, but warns against trying to hasten the process too violently.

► RECOGNITION that the world is undergoing great and rapid changes, with a warning against attempting to hasten the process violently, is one of the conclusions presented by Dr. Edwin Grant Conklin, well-known biologist, in a new book, *Man: Real and Ideal*, just published by Scribner's. Dr. Conklin, who has been president of Science Service since 1937, is professor emeritus of zoology at Princeton University and president of the American Philosophical Society.

"Society is in the throes of revolutionary changes which are inspired by the desire to shatter things to bits and then remould them nearer to the heart's desire. But if such desires are not wise and just they produce ruin rather than progress. This shattering of things to bits in order to remould them nearer to the heart's desire is the method of revolution rather than that of evolution, of tyranny and compulsion rather than of freedom and education, of autocracy rather than of democracy.

"All development builds on what has gone before, and not merely on its ruins. All biological, intellectual, social advance has been made in this way. Utter ruin ends in extinction, and not progress."

Dr. Conklin points to a biological analogy in support of his contention. Sudden large changes are sometimes seen to occur in new generations, in the course of evolutionary development. Changes of this type are known as mutations. Scientists who have observed the occurrence of thousands of mutations know that very few of them can pass the test of natural selection. Early death is the fate of almost all mutating organisms.

"Nowhere in the living world is progress brought about by shattering things to bits," Dr. Conklin observes, "but

rather by relatively minor changes in organization. Only when changes are viable and beneficial can there be 'evolution through revolution.'"

Specifically for the United States, Dr. Conklin foresees a post-war set-up in which the traditional rugged individualism of the space-free pioneers will of necessity become adjusted to the requirements for mutual accommodation inherent in a more closely packed society.

"He would be blind indeed who could not see that at present all social tendencies throughout the world are in the direction of greater consideration for the group and less for the single individual," he points out. "This protection of the many from exploitation by a few is bound to go further in the future. It will surely increase opportunities for the 'common man' and lead to a more just and vital democracy."

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ENGINEERING

Puffs of Powder Make Whistle Signals Visible

► ONE of the best known of American inventors, John Hays Hammond, Jr., is back for another patent, this time on a system for supplementing the sound signals of an air whistle with corresponding visual signals.

Ships' captains used to working with steam, he points out, often depend on watching the white puffs from a whistle rather than on hearing the blasts, especially when the confused noises of many craft in a harbor make the sound of any one whistle difficult to distinguish. To such men the "invisible" blasts from the air whistle customary on diesel-propelled vessels are most unsatisfactory.

Mr. Hammond simply adds a tight cylinder containing a light, fluffy pow-

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der, and provides a supplementary blast of air to puff a cloud of this through a nozzle above the air whistle whenever the latter is sounded. Patent No. 2,334,552 has been issued on this invention.

Science News Letter, December 4, 1943

INVENTION

New Spray Gun Can Handle Two Fluids At Same Time

► A DOUBLE-BARRELED spray gun that can handle two stains, dyes or other fluids at the same time is presented by M. E. Hansen of Silver Lake, Ohio, for patent No. 2,335,116, assigned to American Anode, Inc. It was devised primarily to shorten the process of applying the colors to two-toned shoes, but can be adapted for other uses.

Science News Letter, December 4, 1943

The Michigan *crayfish*, a pre-war bait or bathing beach pest, now is used as food.

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