MEDICINE

# Why Sulfa Drugs Fail

**Increased production in germs of an anti-sulfa chemical is blamed for the fact that in some cases the sulfa chemicals fail to cure.**

➤ THE REASON for failure of the sulfa drugs in some cases, development of a condition which doctors call sulfonamide resistance or sulfonamide fastness, has been traced to increased production by the disease germs of an anti-sulfa drug chemical.

Experiments showing this in the case of Staphylococcus aureus, the kind of germ that causes boils, carbuncles and abscesses, are reported by Dr. Maurice Landy, Dr. Newton W. Larkum, Dr. Elizabeth J. Oswald and Dr. Frank Streightoff, of the Army Medical School (*Science,* March 19.)

The anti-sulfa drug chemical is p-aminobenzoic acid, which has recently been included as a member of the vitamin B family. Scientists found several years ago that the sulfa drugs achieve their germ-stopping and thus disease-curing action, at least in the case of certain germ infections, by interfering with the action of this vitamin the germs must have.

Increased production of the vitamin chemical by the germs was then suggested as the reason for the development of sulfonamide fastness by the germs, a condition which meant that even large doses of the drugs failed to help the patient. The experiments by the Army Medical School bacteriologists, however, give apparently the first direct evidence that this is the case.

Strains of Staphylococcus aureus germs were exposed to increasing concentrations of sulfathiazole. In the course of this exposure they produced germ offspring which were resistant to the drug and which produced 70 times as much p-aminobenzoic acid as the parent, drug-sensitive strains.

These germs, moreover, continued to produce the vitamin chemical in amounts far in excess of normal for many generations after exposure to the sulfa drug. This furnishes additional evidence, the scientists state, for the permanence of sulfonamide fastness.

Other microorganisms, such as the germs of cholera, dysentery and pneumonia, may acquire resistance to sulfa drugs without producing more of the vitamin chemical, the scientists found. Their resistance to sulfa drugs may, it is suggested, be due to production of other, as yet unidentified anti-sulfa drug chemicals which play a role in the vital chemical processes of the germs.

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MEDICINE

# Vitamin Cures Predicted

➤ VITAMIN or other dietary means of preventing and curing now uncontrollable diseases, as we now control scurvy, pellagra and rickets, is predicted for the future by Prof. C. A. Elvehjem, of the University of Wisconsin, in a Sigma Xi lecture to be given throughout the country.

Recent studies in his own and other research laboratories of the 12 or more B vitamins furnish the basis for Prof. Elvehjem's forecast for the future.

Lack of one of the newest B vitamins, folic acid, may be the cause of a blood disorder, a sort of white blood cell anemia, that develops occasionally in patients getting sulfa drug treatment and also sometimes without such treatment. The same condition develops in rats following treatment with certain sulfa drugs, and it also develops in monkeys deprived of the vitamin. The reason the rats get the condition seems to be that the sulfa drugs stop the growth of microorganisms in the rat intestinal tract which normally manufacture some of the B vitamins.

In both monkeys and rats the white blood cell anemia, though induced by diet in the one case and by sulfa drugs in the other, can be prevented by folic acid.

In humans, Prof. Elvehjem suggests, the condition may develop following 20 days of sulfa drug treatment because the patients had been on short rations of folic acid and could not stand further depletion by the drug of their reserve supply of this vitamin.

***FIRE WATCHERS — Quantities of these small thermostats, formerly used in electric irons, are being installed in military equipment. A worker is shown spot welding the base of one of the fire detectors to the body.***

"We can only speculate as to the importance of the other factors in human nutrition," Prof. Elvehjem concluded, "but I am willing to wager that equally important relationships will develop.

"As research continues we may learn from it nutritional means of handling diseases which are uncontrollable today as readily as we now control scurvy, rickets and pellagra."

Biotin, inositol and p-aminobenzoic acid are other new B vitamins which latest studies show may have significance in human nutrition, besides those with which biochemists, nutritionists and even lay persons are now familiar: thiamin, riboflavin, niacin, pantothenic acid, pyridoxine and choline. Two chemically unknown factors needed by the chick for growth and feather production and one or more factors of significance in guinea pig nutrition complete the tally of now known B vitamins.

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*Sodium fluosilicate* may be used to control the grasshopper pest.

*Cotton rope* treated with a new preservative is being used as a substitute for manila rope on ships; the preservative gives the cotton rope firmness and resistance to wear, and protection against marine organisms.