



MATHEMATICS

New Kind of Space Year's Discovery in Mathematics

THE world around us is a four-dimensional universe of space-time: up and down, in front and behind us, to right and left, and the ticking of the clock. That is the physical universe as we experience it in everyday life.

But scientists, particularly the mathematicians, work and play with many other kinds of space, space of many dimensions, space that can not be visualized but must be expressed in terms of symbols and formulae.

The latest news in mathematical circles is that the French mathematician, André Weil, this year has introduced a new kind of space which he calls "uniform space." This is one of the great mathematical advances of the year.

Without making your mind tread among strange concepts and abstruse ideas for many hours, it will be difficult to know just what this means. Some idea of the importance of such mathematical spaces can be obtained from the fact that the geometry of space used by Einstein in his revolutionary theory of relativity was devised by Bernhard Riemann in 1854. Riemann's space of many dimensions, not just four, is the great-granddaddy of the spaces now intriguing mathematicians.

These include spaces of n-dimensions (many dimensions because n represents any number), spaces with infinitely many dimensions, vector spaces, metric spaces, many varieties of topological spaces, projective spaces, and scores of others.

The new space type, uniform space, is one in which "uniform continuity has a sense."

Uniform continuity may be explained as follows: A curve in the plane corresponds to an equation of the form $y=f(x)$, where $f(x)$ represents an expression in x ; a surface in space corresponds to an equation of the form $u=f(x,y)$ where $f(x,y)$ represents an expression in x and y . If for a certain value of x , a small variation in x involves a small variation in y , we say

PUBLIC HEALTH

Health Service Officer Contracts Spotted Fever

Seventeenth on Roll of Martyrs Will Be Saved Because He Had Previously Been Vaccinated

SEVENTEENTH on the federal health service's roll of martyrs who have suffered deadly Rocky Mountain spotted fever in the line of duty is Dr. N. H. Topping, 30, now apparently recovering from the disease at Walter Reed Hospital, Washington, D. C.

Only the fact that he had previously been vaccinated against the infection is expected to save this young Public Health Service officer from death which claimed four of the other 17.

Dr. Topping contracted the disease from spotted fever infected ticks which he was studying at the National Institute of Health. When he was first taken sick, it was thought for a few days that he was suffering from the mysterious virus infection which public health service scientists have only recently discovered and which had already caused the illness of one of the officers. Dr. Topping had also been working with ticks infected with this new, unnamed virus. Appearance of the characteristic Rocky Mountain spotted fever rash, however, clinched the diagnosis.

Although Dr. Topping has been with the service only a few years, he has already shown great promise and aptitude for research, according to one of his sen-

ior officers, and is said to be "a hound for work."

Rocky Mountain spotted fever is a serious disease no matter how contracted, but the infections acquired in the laboratory are particularly severe. This, it was explained, is why the vaccine failed to protect Dr. Topping from developing the disease, although it is expected to save his life.

The four men of the federal health service who died of laboratory-acquired infections were Dr. Thomas B. McClintic, bacteriologist L. A. Kerlee, and laboratory assistants W. Gettinger and George H. Cowan.

Survivors, besides Dr. Topping, are: field assistants Martin L. Nolan, A. N. Chaffin, Frank O. Merritt and Dan Wil-ler; laboratory assistants Lawrence Mc-Neal and W. T. Smith; laboratory attendants Nick Kramis, C. Buford Kaa, Harley Nicol and George Gordon; Philip Gillis, janitor; and H. Wixon, associate construction engineer.

Science News Letter, January 21, 1939

Flint was one of the first important materials in commerce, since prehistoric men traded for it and carried it considerable distances to make good stone weapons.

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that $f(x)$ is continuous for that value of x . If by choosing the variation in x sufficiently small we can make the variation in y *uniformly* small throughout a range of values of x , we say that $f(x)$ and the corresponding graph $y=f(x)$ is uniformly continuous. An analogous statement covers the case of $u=f(x,y)$ and the corresponding surface.

Mathematicians, self-conscious of the difficulties of explaining these concepts, hardly expect the non-mathematician, or

even the ordinary mathematician, to keep up with the progress on the frontiers of these theoretical spaces.

What is important is that it be realized that it is important for these studies to continue. Out of them may come a decade or a century in the future some concept that will illumine the universe as glimpsed by the 200-inch telescope or the atom as created or smashed by the powerful cyclotron.

Science News Letter, January 21, 1939

AERONAUTICS

Controllable Pitch Propellers To Be of Wood and Plastic

Weight Saving of as Much as One-Third is Claimed; Are Built of Laminated Spruce with Plastic Cover

AERONAUTICAL engineering has a new prescription for the tough problem of what to do about propellers getting larger and heavier as engines and planes grow up. A new controllable pitch propeller made of wood and synthetic plastic.

Developed abroad, Schwarz-type propellers will be making their appearance on American airplanes shortly, the Society of Automotive Engineers learned from Fred E. Weick, of the Engineering and Research Corporation of Riverdale, Md.

Weight saving of as much as one-third in the larger propellers is possible, Mr. Weick, who is the inventor of the tri-cycle landing gear, told the society. About 40 of them, ranging in size from six to 16 feet in diameter, have already been built in this country. One of them, an 8-foot propeller, rated at 300 horsepower and weighing 41.5 pounds complete, has an approved type certificate issued by the Civil Aeronautics Authority.

The propeller blades are built of lami-

nated spruce and are protected by a plastic covering. The blades merge into a root of impregnated hard wood, which Mr. Weick calls compreg. The compreg root is screwed into a steel ferrule supporting the blade in the hub. The controllable pitch mechanism turns the steel ferrules.

Wood propellers ordinarily are not of the far more efficient controllable pitch type because of the impossibility of making movable wooden roots attached directly to the controlling mechanism. Because ordinary wood's shear strength is not high enough, screwing wooden roots into metal ferrules is not practical. But the impregnated wood overcomes this difficulty. A phenol-formaldehyde resin is used to impregnate sugar maple, beech, or birch to form the compreg.

Propeller development during the last few years has been characterized, among other things, by repeated predictions that increasing weights would set a limit to propeller size, as more and more of the engine's power would be required in

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accelerating the propeller, let alone developing a thrust to pull the plane through the air. But aeronautical engineers have developed several methods, of which this is the newest in the United States, of saving weight and pushing the theoretical limit further back.

Science News Letter, January 21, 1939

LANGUAGE

Name Jehovah Derived From "To Be Kindly"

THE NAME Jehovah, or Yahveh, in the Old Testament, much debated by scholars, is declared to be derived from a Semitic language root meaning "to be kindly."

Speaking before the annual meeting of the Society of Biblical Literature and Exegesis, Dr. R. Marcus of Columbia University expressed doubt that the Hebrew divine name—written without vowels Yhwh—came from verbal root hwy, conveying the idea of a deity creating and controlling the elements.

The original form, he argued, was Yawiy, which later by confusion with the root hwy was pronounced Yahweh.

Reporting a study of Jewish writers' books on Jesus Christ, Dr. E. S. Tanner of the University of Tulsa said that "the estimation of Jesus by post-war Jewish writers is generally more favorable than for centuries."

Jewish writers' interpretations of Jesus range all the way from "negative evaluations," Dr. Tanner finds, to views equal to those of liberal Christians.

The contemporary writings on Old Testament events unearthed at ruins of Lachish in Palestine were discussed by Dr. A. Sperber of the Jewish Theological Seminary, who finds in them good evidence for his theory that two dialects of Hebrew were spoken in Bible days. The southern and northern dialects, used respectively in Judah and in Israel, can be detected, he said, by study of inscriptions and also parallel passages in Old Testament books.

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