

PHYSICS

Link Relativity, Chance

Two ideas once thought incompatible, Einstein's special theory of relativity and the laws of chance, are tied together in a "general theory of probability."

► EINSTEIN'S SPECIAL theory of relativity is now linked to the laws of chance. The new concept ties together two ideas previously thought irreconcilable.

Formulated by Dr. Nicholas M. Smith Jr. of Johns Hopkins University's Operations Research Office, Chevy Chase, Md., it can be called a "general theory of probability."

It is not one with which the late Prof. Albert Einstein would have agreed. He did not believe that the laws of chance could be used to describe physical events, either in the atomic world or in the cosmos.

Under Einstein's relativity theory, the hands of a clock in a speeding jet plane move infinitesimally slower than those on a wall clock. Under Dr. Smith's general theory of probability, a clock in a very fast-moving system would be expected to slow down but not at a uniform rate. It would slow down with the "jitters," sometimes keeping time faster, sometimes slower, according to chance.

Dr. Smith, in outlining his theory at the meeting of the Operations Research Society of America in New York, reported that he derived it from a study of the rational processes involved in making military decisions.

He showed that there is a general form of the theory of probability which, when special restrictions are applied, can reproduce the same laws now used in physics, as

well as those of psychology, sociology and ethics.

Dr. Smith's generalizing principle is called "the principle of analogical conformity." He found that values or moral judgments have differing degrees of reality depending on their usefulness in rational processes.

Space-time are inextricably interwoven in Dr. Smith's four-dimensional theory as they are in Einstein's. An illustration of this, he said, might occur in a checker game when the probability of "the next move" being one space "to the right" would have a certain value. "The next move" is the time element and "to the right" is the space motion. Thus, space, time and probability are connected.

Instead of a checker game, Dr. Smith used random walks along a line from which a point can move either right or left. When all motion is in one direction, then the highest possible velocity is reached. At this maximum velocity, the system has no dimension in the direction of motion.

Since the direction of motion can be determined at the fastest possible speed, Dr. Smith concluded that probability consists of two parts, one that can be determined (the excess of motion in one direction over the other) and one that is random (whether the motion is to the left or the right).

Science News Letter, June 18, 1955

MEDICINE

Trace Baby Death Causes

► ONE-THIRD OF the deaths of babies before and up to one month of age could be prevented, a New York Academy of Medicine committee has found.

The finding was from a special investigation of babies who died in New York City in 1950.

A new word has been coined for deaths of babies of this very early age in life. The word is perinatal, meaning literally around birth. Deaths at this age, before birth and up to one month after, have not declined in proportion to the decline of infant deaths from one month through the first year of life. For that reason, the special investigation was made.

Over half the 955 baby deaths studied could not have been prevented, the committee found.

In the others the responsibility was divided between the doctors, the hospitals and the families. A breakdown of responsibility factors is given as follows: unavoidable

disaster, 55%; errors in medical judgment, 31%; unsatisfactory pediatric care, 27%; errors in medical technique, 24%; faulty care of the mother before the baby's birth, 22%. In some cases several factors were found together, which explains why the percentages do not add up to 100.

An example of the way several factors contributed is that of the baby who died of bronchopneumonia at the age of 18 days. This infant had a slight cold when the parents took him home from the hospital against medical advice when he was three days old. The mother called the family doctor several times after she had the baby home, but he refused to come to see the child after a visit the first day the baby was home. The responsibility factors were given as intercurrent infection (the cold), inadequate pediatric care (not seen by the doctor), and family at fault (because they took the child home too soon).

The committee findings were analyzed

and reported by Dr. Schuyler G. Kohl of the State University of New York College of Medicine, Brooklyn, N. Y., in a book, *Perinatal Mortality in New York City* (see SNL June 11, p. 380).

Science News Letter, June 18, 1955

MEDICINE

Cutting Nerves Helps Childless Have Babies

► A NERVE-CUTTING operation has enabled 13 out of 14 childless women to have the babies they wanted.

Details of the operation were shown by Dr. Joseph Barnard Doyle of Boston at the meeting of the American Medical Association in Atlantic City, N. J.

AMA members also saw in Dr. Doyle's color motion picture the actual passage of an egg, or ovum, from the ovary where it is produced to the fallopian tube, which carries it to the uterus.

The film showed a previously unproved factor in the travel of the egg. This is the actual movement of the fallopian tube in grasping the ovary in order to receive the egg.

Science News Letter, June 18, 1955

MEDICINE

Drug Seen Remedy for Juvenile Delinquency

► A DRUG may prove to be the solution to the much-discussed problem of juvenile delinquency.

The drug is chlorpromazine. It has already won praise for its ability to quiet greatly disturbed mental patients so that they can be given psychiatric treatment.

Its promise of helping solve the juvenile delinquency problem comes from that same quieting or tranquilizing action. When given to destructive, incorrigible children who seemed well on the way to becoming delinquents, the drug within one week transformed the youngsters into calm, cooperative, better behaved children who no longer resisted psychiatric efforts to help them.

These good results in 39 of 45 children were shown in an exhibit at the American Medical Association meeting in Atlantic City, N. J. The children were treated by Drs. James A. Flaherty and Robert L. Gatski at the Governor Bacon Health Center, Delaware City, Del.

The children had previously resisted all attempts to help them through psychiatric treatment, change in home environment and child guidance. Even when given barbiturate sleeping medicine they still kept their disturbed feelings and confused ideas hidden from the doctors. When given the new drug they calmed down enough to tell their troubles and get help in facing and overcoming them.

The drug is marketed in this country by Smith, Kline and French of Philadelphia under the trade name, Thorazine.

Science News Letter, June 18, 1955