

things about babies' eyes that are new to science. The protective device nature provides for shielding the eye from painful intensities of light—a reflex contraction of the iris—is totally absent in many newborns. Some do not show it at all until they are a week old. All the babies improve in this response during their first two weeks. It is the weakness of this reflex that makes it advisable to keep the new baby away from dazzlingly bright lights.

The ability to fixate both eyes on the same object is another which improves markedly during these first important days of life. If you are trying Dr. Beasley's tests on a young infant of your own acquaintance, move your pen or fingers patiently back and forth from a distance about six inches from baby's nose to fully 12 inches. Somewhere within this range he may be able to fix both eyes on it as early as his very first day. Do not be worried if he can't, though. Some infants can't do it until the second or third day—some not until toward the end of the second week.

Some fixate a single object with both eyes, but others do not. It is this lack of ability to fix both eyes on a given object that gives the young baby that occasional "cross-eyed" or "cock-eyed" look.

Another ability concerning which Dr. Beasley has accumulated new information is the power of the lens in each eye to adjust itself to the changing distances of an object from the eyes of the infant. Unless these lenses, one in each eye, are in focus for the object viewed, the impression which the person gets is one of a blurred object. Since the distance from the center of the lens to the retina of the eye is shorter in newborn infants, and since their lenses do not adjust readily to different distances, the newborn are "nearsighted."

Can a newborn baby notice the difference between a pink blanket and a blue one? Does he realize that the hue of either varies from that of his white pillow slip?

Dr. Beasley's experiments have paved the way for color-vision tests of the newborn and he hopes to give these tests to many infants during the coming year.

This is the test:

On a screen at the foot of the baby's experimental crib will be focused a round spot of colored light. The brightness of both the spot and the background can be varied at the will of the experimenter. Both will be reflected in a mirror placed at an angle

above the infant's head, and this mirror can be adjusted until the spot appears at just the right distance from the baby's eyes.

Now if the baby follows the movement of a cherry-colored spot as it dances about over a leaf-green background of similar brightness, this will demonstrate conclusively that that child is not colorblind to red and green. Since the colors can be varied at will, the child can be similarly tested for any type of colorblindness.

Following the spot is an absorbing game for the young baby, it has already been found in tests designed to measure his keenness of vision. In these tests the lights were not colored; the background of the screen was black and the spot was varied from quite a bright light to a spot so dark that it could not be distinguished from the background. A line of light has also been used for the same purpose:

The baby only a few hours old will follow the movements of a line only an eighth of an inch wide and only very slightly different in brightness from the background. Spots are followed even more readily than the lines.

Individual differences between different infants were very noticeable in all the various visual abilities, and soon it was suspected that those who were most advanced in this regard were the ones who for one reason or another were more fully developed at birth. Perhaps they had received better nourishment or some other advantage from their mothers. Individual infants differ tremendously in their physical development at birth.

Negro babies were found to be superior to the white infants in the vision tests, and they were also more fully developed physically at birth. One little dusky piccaninny even tried to crawl or squirm off the crib while the tests were in progress.

Science News Letter, January 13, 1934

In storing fruits and vegetables commercially, government scientists find that temperatures should be fairly constant, even variations of two or three degrees above or below the desired temperature being too large in most cases.

Singing in the bathroom is popular, explains one physicist, because the singer listens not merely to his own voice but to the musical notes characteristic of the room, and in small rooms lined with tile or hard plaster this resonance is particularly evident.

ELECTRICITY

Electric Piano Has Keyboard But Lacks Strings

PRODUCTION has started in Kalamazoo, Mich., on a piano with no strings. Instead of having lengths of wire to produce the tones, short slivers of steel only a few inches long are vibrated by electricity.

The new instrument, called a clavier, uses a piano keyboard to actuate tone production, in which the note produced is 90 per cent. fundamental and only 10 per cent. overtones, just the opposite of an ordinary piano. Tones are produced by plucking a steel bar which has been properly grooved. The almost inaudible tone is picked up by magnetic induction and passed through an audio-frequency amplifier.

The amplifier unit is specially designed, having a capacity of 30 watts, as contrasted to the two or three watts of the average radio amplifier. Thus the player has at command a tone ranging from a mere whisper to one balancing an orchestra, with little distortion or dilution. In the instrument the impact noise, sometimes audible in a piano, is filtered out, producing what is said to be pure tones, capable of blending with other tones.

The piano was developed by Prof. Lloyd Loar after eight years' experimentation. He was an early experimenter in amplification of tones through electrical means.

It is said that through use of ear phones the piano student may practice his lessons without disturbing anyone, tones being heard only by him. A turn of a dial enlarges the tone capacity, if desired. The piano of the future, employing the tuned sliver-of-steel method, will consist of little more than the keyboard, as the piano movement occupies only a few inches of space.

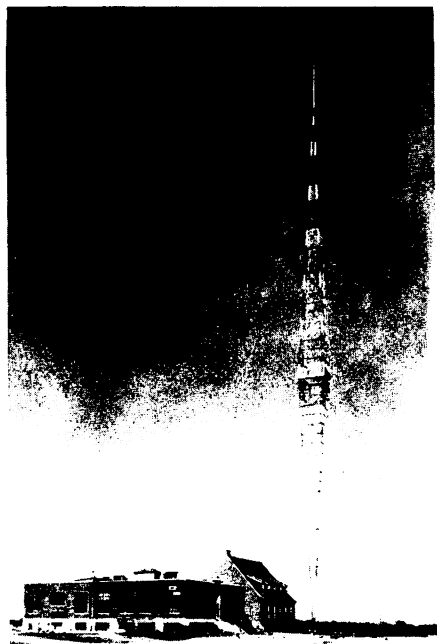
Science News Letter, January 13, 1934

CHEMISTRY

Pure Vitamin Obtained In Quantity Now

A METHOD for obtaining pure vitamin B₁ in large quantities has been developed by Drs. R. R. Williams and Walter H. Eddy, Teachers College, Columbia University. Chemical details of the method are given in a report to the Carnegie Institution of Washington just made public.

By this new method, which is still in



500,000 WATTS

This power, ten times that of the largest American broadcasting stations today, will be radiated from experimental transmitter W8XO nearing completion by the Crosley Radio Corp. at Mason, Ohio. A new 831-foot vertical radiator type antenna is shown towering above the plant. The new transmitter, a bold step toward "super-power" broadcasting, will first operate on test from 1 a. m. to 6 a. m. and is later expected to transmit broadcasts regularly.

process of improvement, yields of from 250 to 300 milligrams of vitamin in crystalline form have been obtained from 50 kilograms of rice polish. While this amount seems very small when considered in terms of large scale production of ordinary substance, since 100 milligrams is only one and one-half grains, roughly, and 50 kilograms is over 100 pounds, it represents from five to fifteen times the yield obtained heretofore by other investigators.

Lack of this vitamin causes nervous disorders, among them beri-beri. While the amounts necessary for health can be added to the diet by ordinary foods as whole grain cereals, chemists need to have rather large supplies of it in crystalline form for further investigations as to its chemical composition and effects on the body. Drs. Williams and Eddy hope that by their method, several steps of which have been carried out on a large scale according to a factory type of operation, they will be able to make the vitamin available in quantities of several grams.

Science News Letter, January 13, 1934

BIOCHEMISTRY

Men Are Walking Drugshops, Dr. Abel Declares in Address

From Human Organs, Pharmacist Can Prepare Arrow Poisons That Would Have Delighted Primitive Warriors

"**W**E OURSELVES are walking drug shops. An experienced chemist or pharmacist would have no difficulty in preparing arrow poisons from some of our own organs that would have delighted the heart of primitive man."

These perhaps surprising statements were among the many facts about poisons that Dr. John Jacob Abel, emeritus professor of pharmacology at the Johns Hopkins Medical School, told members of the American Association for the Advancement of Science in his address as retiring president.

Dr. Abel emphasized the chemical nature of disease, saying that most bacteriologists now believe all infectious diseases are really poisonings. For some diseases such as diphtheria and lockjaw, this has been proved. It is known that these diseases are caused by a poison produced by the "germs" or bacteria. In other diseases, medical scientists suspect that the disease is really a poisoning from some substance produced by the "germs," even though they have as yet no proof for this belief.

The first physiological or pharmacological experiment made by man was probably the smearing of arrows and spear heads with poisons, he said.

"Stinging insects and venomous serpents were no doubt the first among animal forms to invent hypodermic injections, a procedure which was introduced into medical practice only in the years 1845 to 1856," he continued.

The poisons which these insects and snakes produce were not developed solely for self-protection, however. The snake's venom is indispensable to its health, besides containing ferments necessary for its digestive processes. Similarly, the poisons of bees and wasps appear to aid in the development of their eggs after they have been fixed on them.

"Nature has not affixed a poison label to any particular substance or class of substances," Dr. Abel said. "The pharmacist does that."

Among the substances in man's own body which may be poisonous in certain doses are insulin, which controls sugar utilization and is necessary for life and health; adrenaline or epinephrine produced by the adrenal glands and a valuable medicine in certain conditions of diseases; and the hormone produced by the parathyroid glands, excessive amounts of which cause calcium to be removed from the bones at such a rate that they soon cannot support the weight of the body, besides causing other conditions leading to death.

Vitamins, which Dr. Abel characterized as plant hormones, are also poisonous in large doses, although necessary to life in certain amounts.

"From the wider biological view, we should not think of poisons as being inherently more malevolent than any of the other agents or influences of our environment to which we are constantly exposed," Dr. Abel stated. "I incline to the belief that no living cell exists whose contents or metabolites are not toxic to some other living cell."

Science News Letter, January 13, 1934

ARCHAEOLOGY

Saul's Fortress-Palace Found At Gibeah

ARCHAEOLOGISTS have at last identified the fortress of King Saul, the walled capital from which the Bible hero went out time and again with his soldiers to wage war against the enemies of Israel. Success in identifying the ruins of Saul's palace-fortress is reported by Prof. W. F. Albright, director of the American School of Oriental Research in Jerusalem.

The site is known today as Tell el-Ful. Prof. Albright began excavating there twelve years ago. But his work was interrupted before the history of the fortress could be traced. That the site was really Gibeah, the capital of King Saul, has long been accepted as presumably true. But like most Bible sites, this one had a number of stages