

which has remained the same in amount all through these changes. By the process of expansion the mountains have been forced up, and the mass thus raised above the level has produced a corresponding *attenuation* of matter below. This attenuation is most likely very trifling, as it probably exists through a great depth. Whether this cause will produce a sufficient amount of compensation can be determined only by submitting it to calculation, which I proceed to do. . . .

ON THE CONSTITUTION OF THE SOLID CRUST OF THE EARTH. By Archdeacon Pratt. In *Philosophical Transactions of the Royal Society of London*. Vol. 161. London: MDCCCLXXI (1871).

A FEW years ago I proposed the following hypothesis regarding the Constitution of the Earth's Solid Crust, viz.:—that the variety we see in the elevation and depression of the earth's surface, in mountains and plains and ocean-beds, has arisen from the mass having contracted unequally in becoming solid from a fluid or semifluid condition: and that below the sea-level under mountains and plains there is a deficiency of matter, approximately equal in amount to the mass above the sea-level; and that below ocean-beds there is an excess of matter, approxi-

mately equal to the deficiency in the ocean when compared with rock; so that the amount of matter in any vertical column drawn from the surface to a level surface below the crust is now, and ever has been, approximately the same in every part of the earth.

The process by which I arrived at this hypothesis I will explain. In the *Philosophical Transactions* for 1855 and 1858 I showed that the Himalayas and the Ocean must have a considerable influence in producing deflection of the plumb-line in India. But by a calculation of the mean figure of the earth, taking into account the effect of local attraction, it appeared that nowhere on the Indian Arc of meridian through Cape Comorin is the resultant local attraction, arising from all causes, of great importance. This result at once indicated that in the crust below there must be such variations of density as nearly to compensate for the large effects which would have resulted from the attraction of the mountains on the north of India and the vast ocean on the south, if they were the sole causes of disturbance,—and that, as this near compensation takes place all down the arc, nearly 1500 miles in length, the simplest hypothesis is, that beneath the mountains and plains there is a deficiency of matter nearly equal to the deficiency in the ocean itself. . . .

Science News Letter, May 21, 1932

MEDICINE

Yellow Fever Susceptibility Determined by New Test

A TEST for determining the success of the new vaccine against yellow fever, dread plague which claimed five victims out of every hundred persons in New Orleans fifty-eight years ago, was discussed at the meeting of the American Medical Association there.

Drs. T. P. Hughes and W. A. Sawyer of the Rockefeller Foundation, New York City, who just announced that they were able to give lasting protection against yellow fever by a newly-developed method that makes use of mouse serum, described the test.

In this test the germ or virus of yellow fever is mixed with the blood serum of the person being tested and injected into mice. If the person has in his blood

protective substances that guard against yellow fever, they will neutralize the yellow fever virus and the mice stay well. If the mice get the disease it proves that the person's blood lacks the protective substances and hence that he is susceptible to the disease.

The specific nature of this test was proved by trying it on Canadians, who have never been exposed to yellow fever. As was expected, it showed that they did not have the protective substances.

Science News Letter, May 21, 1932

Platinum melts at a temperature of 3200 degrees Fahrenheit, a heat some 500 degrees higher than is needed to melt steel.

PHYSIOLOGY

Reactions of Normal Eyes Timed with Movie Camera

MEASUREMENTS with the motion picture camera of the time it takes the pupils of normal eyes to contract and to dilate were reported by Dr. Harry S. Gradle of Chicago, at the meeting of the American Medical Association. He found that when light is flashed on a normal eye accommodated for the dark, there is a latent period of about one-tenth of a second before the pupil starts to contract. Then, in a little over four-tenths of a second, the pupil jumps to its maximum contraction. When the light is removed, the pupil starts to dilate at a uniform rate. In making his studies, Dr. Gradle was obliged to use young, blue-eyed, blond persons, because the dark irises of brunets did not photograph clearly enough.

Science News Letter, May 21, 1932

ENGINEERING

Iodine From Oil Brines Breaks Former Monopoly

LARGE scale production of iodine from salty brines in California and Louisiana has freed America from a South American monopoly of this essential chemical element.

This was revealed at a review of recent chemical progress arranged by the American Institute.

For years this comparatively rare chemical element has been controlled by interests in Chile that restricted the amount sold and charged a high toll. Several years ago Los Angeles petroleum engineers analyzing brackish waters from oil wells near Long Beach, Calif., discovered iodides in paying quantities. Difficulty was experienced in freeing the iodine from the large amount of worthless salts with which it was associated, but processes were perfected that resulted in commercial production of the element from both Californian oil well brines and a salt-water well in Louisiana. This assures the continuance of the supply of iodine necessary for drug, disinfectant, photographic and other uses even during a possible wartime blockade. It may reduce the price of iodine so materially as to allow new uses.

The successful production of milk of magnesia from sea water in California was also reported by S. D. Kirkpatrick, editor of *Chemical and Metallurgical*

Engineering, who coordinated the summaries of new chemical achievements.

How wood can be protected and given metal coats by impregnating it with alloys of light-weight metals, such as lead, zinc, tin and antimony, has been perfected in Germany, the meeting was told.

Synthetic rubber, felt-coated steel, pyrex glass bricks and so-called plastic metals made of metal powders bound together with a cellulose compound were also exhibited.

Science News Letter, May 21, 1932

ARCHAEOLOGY

Modern Indians Surpassed By Monte Alban Jewelers

THE PREHISTORIC Indians who fashioned the now famous Monte Alban jewels were finer craftsmen than can be found today among all the Indian jewelers of Mexico.

This is the tribute paid by Indian jewelers from the State of Guerrero who have examined the beautiful ornaments found last January in the treasure tomb of Monte Alban, Mexico.

The gold articles which the jewelers examined were pronounced over eighteen carat pure. What appears to be delicate filigree in some of the golden ornaments, experts recognized as not filigree at all. The articles were actually poured in molds very finely and skillfully carved. Other pieces were wrought in a hammered process, they said.

Science News Letter, May 21, 1932

BIOCHEMISTRY

Synthetic Hormones May Be Too Pure to Be Effective

BIOCHEMISTS are producing hormones that are too pure, Dr. Joseph C. Aub of Boston suggested before the meeting of the Association for the Study of Internal Secretions. These highly purified extracts do not produce the practical results on patients that earlier, impure extracts did, he pointed out. He suggested that in the process of getting pure crystals of a hormone, the chemist may have broken down the natural compound and gotten a "degradation product" lacking some essential of the original one produced by the gland in the body. He also warned the physicians against laying too much stress on glandular treatment alone and said there was no excuse for treatment with several glandular products at once.

Science News Letter, May 21, 1932

GENETICS

Genes, Once Hypothetical, Now Seen and Photographed

GENES, the ultimate units in heredity, have been seen and photographed. So declares Dr. John Belling, biologist on the staff of the Carnegie Institution of Washington.

Genes have hitherto been dealt with as hypothetical entities by biologists, because no one has ever actually seen them. They were like the atoms and electrons that make up matter: physicists treat them as actually existing things, though it is impossible to give them visual demonstration. But now Dr. Belling believes that he has brought the genes out of their invisibility.

All living cells contain structures that presumably contain genes—the chromosomes within the nucleus. But to get clear-cut pictures of chromosomes not all cells will do equally well. In the cells of some organisms chromosomes are too numerous or too small to work with conveniently; in others their outlines are not clear-cut.

Dr. Belling found lilies suitable for his purpose. By exceedingly fine and skillful microscopic technique, he got the contents of the pollen "mother-cells," each only one four-hundredth of an inch in diameter, emptied out on glass slides. By suitable chemical treatment he made the small divisions of the chromosomes, known as chromomeres, sharply visible. By further manipulation he was able to detect, within each chromomere, an exceedingly minute object which he takes to be the gene itself. A typical cell of the type Dr. Belling has been working with contains about 4400 genes, arranged in 2200 pairs.

The picture on the cover of this week's SCIENCE NEWS LETTER shows chromomere strings in a single cell of a lily.

In commenting upon the function of cell structures, Dr. Belling says:

"A minute cell sphere with its 2200 gene pairs suggests the celestial sphere visible to the unaided eye and containing fewer than 3000 stars which can be seen at one time. These stars were supposed by some to exert a mystic influence on human beings. In the spherical cells of the organism, however, the genes actually do exert specific influences on the life of the organism in question,

whether of the lily or of man. In fact these influences are so great that if the effects of all the thousands of genes in a given organism were added together nearly the whole of its inheritance would be accounted for.

"These strings of chromomeres are of more consequence, therefore, than the threads of life which, according to the old fable, the Fates were supposed to spin. Indeed, in many of the old sayings relating to the influences of the stars, if the term gene or chromomere be substituted for star the saying would hold today. Could we but identify every one of the chromomeres in a man, (probably there are many more than in a lily), a reliable horoscope for him could be drawn up."

Science News Letter, May 21, 1932

PLANT PHYSIOLOGY

Secret of Photosynthesis Baffling to Scientists

SCIENCE has not yet solved the green leaf's secret of storing up the energy of sunlight by converting carbon dioxide into carbohydrates, it appears from research by Prof. G. Mackinney of the University of California's division of plant nutrition.

Vegetation has the ability of turning carbon dioxide, the gas exhaled by organisms and given off by fire, into carbohydrates, useful as starches, sugars and cellulose. Some six years ago Prof. E. C. C. Baly, professor of chemistry, University of Liverpool, reported the reduction of carbon dioxide to formaldehyde and carbohydrates in vitro, that is, in the test tube. Others worked on the same important problem with varying success. Prof. Mackinney has attempted to repeat the experiments but has been forced to conclude in his report to the American Chemical Society that "no procedure has yet been published whereby conditions for obtaining formaldehyde and carbohydrates in vitro can be duplicated."

Photosynthesis, as this process is called, is fundamental to the existence of life on earth through the utilization of sun energy.

Science News Letter, May 21, 1932