

ing of the Anthropological Congress would take place when the next meeting of the Americanists is held in Europe, that is, in 1934. The Council of the Royal Anthropological Institute accordingly invites the anthropologists of all countries to co-operate in forming such a congress.

#### Isolation of Vitamin B<sub>1</sub>.

In the second issue of the *Zeitschrift für Physiologische Chemie* for 1932, Prof. Windaus and his co-workers announce the isolation of the anti-neuritic vitamin B<sub>1</sub> in what appears to be the pure state. In 1926, Jansen and Donath reported the preparation from rice bran of a crystalline substance having the formula C<sub>6</sub>H<sub>10</sub>ON<sub>2</sub>, which was believed to be the vitamin, but subsequent work, notably that of Jansen, Kinnersley, Peters, and Reader, in 1930, showed that the substance was not pure. In 1929, Windaus took up the preparation of vitamin B<sub>1</sub> from yeast, and in the initial stages of purification he followed well-known lines. From the neutralised raw extract he has recently prepared the gold salt, decomposed this with hydrogen sulphide, and from the filtrate isolated the picolonate, which is dimorphous. Analysis of the picolonate gave the surprising result that the vitamin contains sulphur as well as nitrogen: its formula is probably C<sub>12</sub>H<sub>17</sub>N<sub>3</sub>OS. The hydrochloride was prepared; its absorption spectrum gave a maximum at 250-260 μμ, and its potency, determined on pigeons, was 1.4-3.3 γ, as against 9 γ found by Jansen and others for the substance isolated by the original method of Jansen and Donath. Prof. Windaus states his belief that he has now isolated the pure vitamin.

#### Structure of the Cell Nucleus.

In his presidential address to the Royal Microscopical Society delivered on Jan. 20, Prof. R. Ruggles Gates reviewed present knowledge regarding nuclear structure, especially in relation to genetics. On the basis partly of investigations in his own laboratory, Prof. Gates believes that the nucleolus contains two substances, one of which enters the chromosomes in prophase and leaves them in the telophase of mitosis, and that the chromosome is a double structure throughout the mitotic cycle, a split of the chromonema occurring in metaphase for separation in the following metaphase. The chromonema is derived by the union of chromosomes in prophase, and during interkinesis the chromosome is represented by a double chain of chromomeres. From the evidence of karyomeres in animal cells, the nucleus is regarded as a compound structure, and it was further suggested that the spindle is also compound, the real unit in mitosis being a chromosome with its surrounding karyolymph, which becomes transformed into spindle fibres.

PROF. GATES discussed the relation of chromomeres to genes, pointing out that we have no real knowledge of why the chromosome behaves as a unit. He suggested that the chromosomes of Protista are undifferentiated along their length, and that genic mutations have led to their gradual differentiation, with

the probable result that genes are of different sizes. The gene is, however, not a representative particle but a physiological unit, the conception being necessitated both by the phenomena of crossing-over and of mutation. Each genic difference affects many or all parts of the body. Estimates indicate that the gene is of the same order of size as virus particles, and some at least cannot be composed of more than a few hundred molecules. The specific attractions which arise between chromomeres in meiosis belong to the level of organic rather than physical phenomena, and are at present wholly unexplained. Such conditions as high and low temperatures may inhibit this attraction, and genic mutations have arisen in which asynapsis occurs in one or in both sexes, leading to pollen or seed sterility. Prof. Gates stated that it is not at present clear exactly where the limitations of the gene theory lie.

#### The Expanding Universe.

In his Friday evening discourse at the Royal Institution on Jan. 22, Sir Arthur Eddington discussed the expansion of the universe. Outside our own galaxy of stars there exists a vast number of external galaxies, each containing many millions of stars, which appear as nebulae. These are to be found running away from us almost unanimously; and the farther away they are, the faster they recede. This effect has been observed up to a distance of more than a hundred million light-years; the speed there reaches 20,000 km. a sec.—as fast as an alpha particle. It looks at first as though the nebulae must have a particular aversion to us, but it is not difficult to see that the recession is the effect of a general expansion of the universe, and is not especially aimed at us. An effect of this kind has been anticipated theoretically. Einstein's law of gravitation contains a term representing repulsive force, which is ordinarily minute and negligible; but at very great distances the repulsion becomes large and overmasters the ordinary gravitational attraction, so that very remote objects tend to scatter apart. The theory, however, does not predict the magnitude of this 'cosmical repulsion', and hitherto it has only been possible to evaluate it from direct astronomical observations of the nebulae. Sir Arthur is convinced, however, that precisely the same cosmical term is concerned in the theory of the atom and supplies the standard which determines, for example, the radius of an atom. So that out of the theory of the atom (without any astronomical observations) we can predict the rate of recession of the nebulae; or alternatively, astronomical observation of the distances and velocities of the nebulae is a method of determining the masses of the electron and proton. Sir Arthur stated that, in his opinion, this astronomical phenomenon of the expanding universe is the main clue by which we can ultimately unravel the mechanism of the atom.

#### The Teleprinter.

SPEAKING at the annual dinner of the Insurance Institute at Birmingham on Jan 22, Sir Kingsley Wood, Postmaster-General, said that the Post Office hopes to introduce in a few months' time a tele