presence of II and I in the same culture liquid poses the question of the mechanism of their synthesis by the organism and suggests as one possibility the existence of an enzyme that catalyzes their interconversion, namely, an amide dehydrase.

MARJORIE ANCHEL

New York Botanical Garden, Bronx Park, New York

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5 January 1955.

Association of Susceptibility to Poliomyelitis with Eye and Hair Color

Minto (*1*) recently stated that, in an investigation of 1183 cases of poliomyelitis in members of the Caucasian race, only 18 had blond hair and, of these, only one had blue eyes. The sex and age groups of the population concerned were not given, but presumably the data referred to children of both sexes. As a result of the present investigation (*2*), no significant color differences were found in a series of men born in the British Isles who have had poliomyelitis, either as children or as young adults, when compared with a similar series of men who have not had this disease.

Records of 914 cases of poliomyelitis in the service personnel of World War II were collected from the Ministry of Pensions and National Insurance; this was the total number of such cases in which the eye and hair color were recorded. A control series of 5127 cases of injury had previously been made for investigations into a possible association between pigmentation and disease (*3, 4*). (The classification of color types used is that of MacConaill (*5*), namely, blond—blue or gray eyes and fair hair; dark—brown eyes and dark hair; glaucope—blue or gray eyes and dark hair; and cyanope—dark eyes and fair hair. *Blue eyes* in this paper means blue, gray or blue-gray.) Because the proportions of the different color types vary with age, the data have been divided into 5-year age groups. (Eye color does not vary significantly within the age limits of the present series.) It is also known that the proportions vary in different parts of the British Isles, but London was the only area in which there were sufficient cases for this further breakdown of the data.

The differences between the two series are small. They amount to an excess of fair hair and the blond type in the poliomyelitis cases as compared with those of injury. The differences are not significant, the values of P for the complete series being 0.01–0.02 for hair color and 0.02–0.05 for the MacConaill types, and 0.2–0.3 and 0.3–0.5 for the same characters in the London area.

The records of eye and hair color in these cases were made by recruiting boards. To attempt a discussion of fine degrees of color variation on such evidence would be absurd, but there are good reasons for stating that the records are accurate insofar as main color divisions are concerned, for example, fair and dark hair, blue and nonblue eyes. Following are examples of such reasons. (i) The darkening of fair hair with advancing age is known (*6*). The fall in the proportion of fair hair and the blond type in the older age groups is well shown in the series of injuries. (ii) The association of melanoma with the blond type is known (*7*). The 36 cases of this tumor in the Ministry's records in which eye and hair color were recorded showed percentages of 77.8, 41.7, and 33.3 for blue eyes, fair hair, and the blond type, respectively, as compared with 59.3, 24.0, and 19.1 in the control series of injuries. (iii) The percentage of hair classified as "red" in the series of injuries is 3.3, showing no significant difference from the recorded proportions of this color in European stocks (*8*).

A. J. LEA

134 Bispham Road, Bispham, Lancashire, England

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17 February 1955.

Preliminary Description of Coffinite—a New Uranium Mineral

A new extremely radioactive black mineral from the La Sal No. 2 mine, Mesa County, Colorado, was collected by L. B. Riley, L. R. Stieff, and T. W. Stern, of the U.S. Geological Survey, in August 1951. This new mineral, a uranous silicate ($USiO_4$) with some $(OH)_4^{-4}$ substituting for $(SiO_4)^{-4}$, has been named coffinite in honor of Reuben Clare Coffin. Coffin has made extensive geologic investigations in southwestern Colorado. His report on the uranium-vanadium deposits of the Colorado Plateau (*1*) has been a major contribution to the understanding of the geology of this area.

Since the collection of the first sample of coffinite, we (*2*) and others have identified this mineral from more than 15 uranium mines in the Triassic and Jurassic sediments of the Colorado Plateau. The new mineral has also been collected from mines in the Tertiary sediments of the Gas Hills area, Fremont County, Wyoming, from mines in the pre-Cambrian metasediments near Globe, Arizona, and from the Copper King mine, a vein deposit in Larimer County, Colorado, as well as from several foreign localities.

Coffinite is a major uranium mineral in the unoxidized ores of the Colorado Plateau. It is commonly black with an adamantine luster. In transmitted light, coffinite is opaque except on thin edges, but in fragments of minus 325-mesh size (less than 44 μ), it is pale to dark brown. It is closely associated in the Colorado Plateau with carbonaceous material, uraninite, black vanadium minerals, pyrite, quartz, and clay. The mineral is very fine grained, and a clean separation of it from the organic and other fine-grained material has not been successful to date. Its fine-grained nature is also shown by broadened lines in its x-ray diffraction powder pattern. The highest specific gravity of coffinite concentrates relatively free of organic contamination is 5.1. A fuller description of coffinite is in preparation.

Coffinite is best identified by its x-ray powder pattern. It is tetragonal ($a_0 = 6.94$ A and $c_0 = 6.31$ A for material from the Arrowhead mine, Mesa County, Colorado) and has strong lines at 4.66, 3.48, 3.47, 2.65, 2.64, and 1.80 A. These measurements vary slightly from sample to sample. The x-ray powder pattern is similar to that of thorite ($ThSiO_4$), but the mineral contains no thorium.

Several samples of the purest coffinite concentrates have been analyzed by A .M. Sherwood. These analyses show as much as 61 percent uranium with varying amounts of silicon, arsenic, and vanadium. There is not sufficient SiO_2 present in these samples for the mineral to be a simple uranous silicate. Detailed leaching studies have shown that arsenic, vanadium, and aluminum are not essential constituents.

Infrared analyses on minus 400-mesh, vacuum-dried coffinite by R. G. Milkey (U.S. Geological Survey) show strong absorption in the regions between 2.8 and 3.1 μ. These two absorption bands are characteristic of bonded OH groups with some unbonded OH and isolated SiO_4 tetrahedra, respectively. The deficiency of silica and the presence of bonded OH groups suggest that $(OH)_4^{-4}$ has substituted for $(SiO_4)^{-4}$. Frondel (*3*) found that this substitution exists in thorogummite, $Th(SiO_4)_{1-x}(OH)_{4x}$, which is the hydroxyl-containing variant of thorite in which $(OH)_4^{-4}$ substitutes for $(SiO_4)^{-4}$. The proposed chemical formula for coffinite is $U(SiO_4)_{1-x}(OH)_{4x}$.

Attempts to synthesize $USiO_4$ by G. W. Morey (Geophysical Laboratory, Carnegie Institution of Washington), Clifford Frondel (U.S. Geological Survey and Harvard University), and S. M. Lang (National Bureau of Standards), as well as attempts in the U.S. Geological Survey laboratories, have not been successful to date.

A. D. Weeks, M. E. Thompson, and A. J. Gude, III, of the Survey, and Frondel have also worked on this problem. This work is part of a program being carried on by the Survey on behalf of the divisions of raw materials and research of the U.S. Atomic Energy Commission.

L. R. Stieff
T. W. Stern
A. M. Sherwood

U.S. Geological Survey, Washington 25, D.C.

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22 March 1955.

The Measurement of Rotational Speed with a Sonometer

A simple device for the measurement of centrifugal speeds from 50 to 220 cy/sec without contact between the instrument and the rotating object is described here. An application of this device in measuring the speed of the Servall centrifuge (Model SSI), as used in recent experiments on brain particulates in this laboratory (*1*), is also given (Fig. 1).

A permanent magnet *M*, made from a piece of razor blade, is affixed with adhesive tape to the upper surface of the screw that holds down the lid of the rotating centrifuge bowl. The blade does not disturb the balance of the centrifuge. On level with the magnet, a small electromagnetic coil *C* is mounted on the cage of the centrifuge in such a position that the poles of the permanent magnet, when rotated, pass close to the soft-iron core of the electromagnet. Thus, the elements of an alternating-current generator are formed, with the magnet as rotor and the coil as the stator. The alternating current produced is amplified by an audio-frequency amplifier *A* and passed through the wire of a sonometer which, in turn, passes between the poles *N* and *S* of a permanent magnet. The string (a

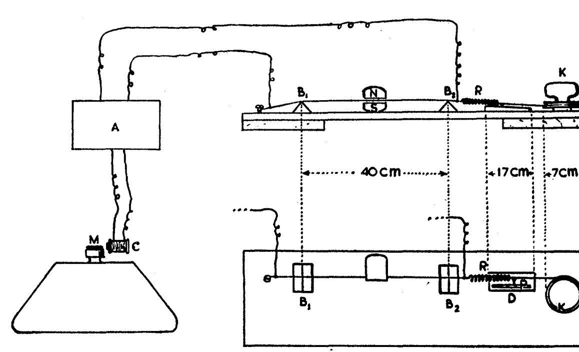

Fig. 1. Diagram of sonometer.