

much more readily, and the discrepancy in the case of magnetite is discussed below.

Attempts to apply corrections on the basis of average helium retentivities have made little improvement in the accuracy of dating, although such correction does tend to place the helium ages calculated for different types of specimens on a more common basis. At the present time it seems that such corrections do not provide 'ages' of sufficient accuracy for use in geological correlation. A consideration of the local effects of metamorphism, and a more general plot of retentivity against expected geological age, show the discrepancies to be due in part to the variation in retentivity of minerals with geological history. It is fairly definite that low values of I/A are caused by metamorphic changes, deuteric action, some mineralization processes, and by weathering. In a series of Algomian hornblendes from one area, a relationship between the degree of alteration and helium index was found. It is also apparent that loss of helium may be caused by crystal imperfections, localization of the radioactive elements, and by interruptions in structure.

Two possible alternatives remain: first, the use of perfect minerals, if such can be found, and secondly, the correction of helium indexes by means of characteristic equations or curves for each mineral, such as retentivity-alteration curves. I have had some success with the second method, but it is doubtful whether a generally useful method can be developed. It is also uncertain whether any crystal can be said to be perfect so far as retaining its radiogenic helium is concerned; and the chance of its containing excess helium renders the result subject to error in any case.

Although it has been suggested that magnetite generally retains most of, if not all, its helium, and so gives reliable helium ages², results obtained in this laboratory indicate magnetite to be no better than some other iron minerals. Although some samples have appeared to give ages consistent with the lead time-scale and geological data, others have shown pronounced loss of helium, and a few have shown evidence of large amounts of extraneous helium. Furthermore, age determinations on other minerals separated from magnetite-rich samples have shown discordant results in all cases, the helium indexes frequently being higher than those for magnetite. The few examples given in Table 2 show the unreliability of using helium indexes of magnetite as criteria of age.

TABLE 2. SOME RESULTS ON MAGNETITES

Locality	Helium index, I	Expected age, A	"Retentivity", I/A
Magnet Cove, Ark. ...	42	150	0.28
Bushveld Complex, Africa	39,200	575	6.53
Port Henry, N.Y. ...	230	600	0.37
Franklin, N.J. ...	181	600	0.29
Yellowknife, N.W.T. ...	2,640	575	4.6
Yellowknife, N.W.T. ...	16,500	575	28.7

At the present time, insufficient is known of the causes of the discrepancies to permit correction of helium indexes, and while some mineral specimens give a value of I/A of unity, one cannot be confident from preliminary examination of the mineral that the 'correct' age will be obtained. It must therefore be concluded that the helium method in its present stage of development is not generally reliable as a means of geological correlation.

¹ Keevil, N. B., *Amer. J. Sci.*, **36**, 406-16 (1938); see *NATURE*, **143**, 32 (1939).

² Hurlley, P. M., and Goodman, C., *Bull. Geol. Soc. Amer.*, **52**, 545-60 (1941).

FORTHCOMING EVENTS

MONDAY, OCTOBER 13

THE FARMERS' CLUB (at the Royal Empire Society, Craven Street, London, W.C.2), at 3 p.m.—Mr. James Mackintosh: "Feeding Livestock under War Time Conditions".

TUESDAY, OCTOBER 14

ILLUMINATING ENGINEERING SOCIETY (at the E.L.M.A. Lighting Service Bureau, 2 Savoy Hill, London, W.C.2), at 2.45 p.m.—Mr. W. J. Jones: "Light and Lighting—A Forward Outlook" (Presidential Address).

WEDNESDAY, OCTOBER 15

INSTITUTE OF FUEL (in the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2), at 2.30 p.m.—Mr. W. M. Selvey: "The Hundred Thousand, an Engineer's Philosophy" (Presidential Address). Dr. Clarence A. Seyler: "Recent Progress in Coal Petrology" (Melchett Lecture).

THURSDAY, OCTOBER 16

CHEMICAL SOCIETY (at Burlington House, Piccadilly, London, W.1), at 2.30 p.m.—Prof. I. M. Heilbron, F.R.S.: "Some Aspects of Algal Chemistry" (Eighth Hugo Müller Lecture).

FRIDAY, OCTOBER 17

NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (at the Literary and Philosophical Society, Newcastle-upon-Tyne), at 6 p.m.—Annual General Meeting. Mr. W. A. Woodeson: Presidential Address.

SATURDAY, OCTOBER 18

NUTRITION SOCIETY (at Cambridge).—Conference on "The Evaluation of Nutritional Status". (See page 433 of this issue.)

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

PRINCIPAL of Melton Mowbray and District County Technical College—W. A. Brockington, Esq., Grey Friars, Leicester (October 14).

PSYCHOLOGIST—The Hon. Secretary, Cheltenham and County Child Guidance Clinic, Education Department, Municipal Offices, Cheltenham (October 15).

LECTURER IN THE DEPARTMENT OF PHARMACY—The Principal, Central Technical College, Suffolk Street, Birmingham 1.

ASSISTANT CONTROLLER OF TELECOMMUNICATIONS (ENGINEERING) for the Malayan Postal Service—The Crown Agents for the Colonies, 4 Millbank, London, S.W.1 (quoting M/9795).

LECTURER IN PRINCIPLES OF EDUCATION at Victoria College, Belfast—The National Froebel Foundation, 2 Manchester Square, London, W.1.

INDUSTRIAL CHEMISTS (preferably with works experience)—The Director, British Launderers' Research Association, The Laboratories, Hill View Gardens, Hendon, London, N.W.4.

ASSISTANT MISTRESS TO TEACH ELEMENTARY SCIENCE AND MATHEMATICS—The Headmistress, Day Technical School for Girls, Fort Pitt, Chatham.

FIRST CLASS HONOURS GRADUATE IN CHEMISTRY, WITH SUBSIDIARY PHYSICS—The Principal, University Correspondence College, Burlington House, Cambridge.

REPORTS AND OTHER PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

British Electrical and Allied Industries Research Association. Technical Report, Reference A/T83: "Mechanical Behaviour of Bitumen. By W. Lethersich. Pp. 28. (London: British Electrical and Allied Industries Research Association.) 15s. [179]

Other Countries

Proceedings of the United States National Museum. Vol. 90, No. 3108: Synopsis of the Tachinid Flies of the Genus *Tachinomyia*, with Descriptions of New Species. By Ray T. Webber. Pp. 287-304. Vol. 90, No. 3113: Pamlico Fossil Echinoids. By Willard Berry. Pp. 443-446+plates 63-65. (Washington, D.C.: Government Printing Office.) [179]

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