

the structure contours drawn on the top of the Basement for this area trend at right angles to the generally accepted trend^{1,4}. (4) Hadhramut: the plotted lengths of folds shown on ITMA 1968 differ from lengths shown on the USGS-ARAMCO map of the Arabian Peninsula and from Beydoun⁵. (5) Ethiopia: almost 95 per cent of the faults plotted on ITMA 1968 differ in some way from the faults shown on the International Committee of Scientific Unions (ICSU), Upper Mantle Committee (UMC)-UNESCO *Structural Sketch Map of part of the Rift Zone of Eastern Africa*, scale 1 : 5,000,000, published in Nairobi, 1965. (6) North-west Uganda and adjacent areas: in the Nimule (Sudan) and Lake Albert areas (Uganda) the fault pattern portrayed on ITMA 1968 differs from that plotted on 1 : 1,250,000 map 1961 published by the Uganda Geological Survey. The Aswa Mylonite Zone is plotted as a fault, even though a symbol for mylonite is listed in the legend. (7) Kenya and Uganda: the interpretation shown on ITMA 1968 differs widely from that published on the 1965 UMC-UNESCO East Africa 1 : 5,000,000 map. New data appear to have been added for Uganda but data of a similar type have been omitted from an area in Kenya west of Lake Rudolf. (8) Tanzania: the fault pattern for the whole of Tanzania has a novel look on ITMA 1968. New data have been added to the 1965 UMC-UNESCO 1 : 5,000,000 map and to the inter-territorial geological map of East Africa, 1961. Data plotted on both these maps have been omitted however from the ITMA 1968. (9) Faults and other structures plotted on the previous structural map of Africa, *Esquisse Structurale Provisoire de l'Afrique*, 1958 edition, scale 1 : 10,000,000, published by the International Geological Congress and the Association of African Geological Surveys, have been omitted from ITMA 1968 for the rift system. Similarly some of the rift structures shown on the *Geological Map of Africa 1963 Edition*, scale 1 : 5,000,000 (GMA), published by the Association of African Geological Surveys and UNESCO, are omitted or are plotted differently on ITMA 1968. (10) Distribution of the Mozambiquian Belt: much has been written in recent years about the nature and distribution of the Mozambique Belt, and other ancient fold systems in Africa. Attention has been drawn to both positive and negative correlations of rift trends and basement structures, therefore it is important that structural data and age determinations should be plotted as accurately as possible.

Cahen and Snelling⁶ provided a convenient summary of knowledge of ancient fold systems and metamorphic belts in Central Africa but, despite the fact that reference is made to Cahen as a contributor to ITMA 1968, important conclusions made by them bearing on rift geology have been omitted.

ITMA 1968 shows a radically different interpretation. Mozambiquian (730-600-450 m.y.) is not shown at all in the area of the Albert-Edward rift depression, whereas the Uganda Basement (2,500-2,600 m.y. or older), between the Aswa Mylonite Zone and the Tertiary Volcanics of Turkana, and in the southern Sudan, is labelled Mozambiquian.

Also Mozambiquian pattern has been applied to approximately 300,000 square miles in the Sudan Republic. Only two radiometric ages have been reported for Sudanese Basement Complex rocks. Both are in the northern Sudan⁷⁻⁹ and were submitted to the coordinators of ITMA 1968.

Because the Mozambiquian can only be defined radiometrically, it is misleading to attempt to delimit it in the Sudan Republic without radiometric data over an area of approximately 300,000 square miles.

The treatment of the African Rift on ITMA 1968 raises a number of fundamental points.

It is clear that the proofs of the map were not checked by contributors, and persons who contributed base documents, and whose names are listed on the ITMA

1968, are now placed in the position of condoning versions with which they do not agree.

A second point is why were UNESCO-UMC documents produced at an international meeting of geologists and geophysicists convened in Nairobi, 1965, specifically to coordinate African Rift studies, apparently ignored, and another version of the geology of the East African Rift System plotted on the AAGS-UNESCO sponsored ITMA 1968?

Finally, the state of portrayal of the African Rift System on the ITMA 1968 indicates grave defects in the method by which the basic data were collected, processed, plotted, checked and edited. Internationally acceptable procedures must be established and such maps must reflect the opinions of the contributors and not those of regional coordinators (North-East Africa and Arabia, L. Dubertret; eastern Africa and Madagascar, J. W. Pallister; and Central Africa, J. L. Mestraud).

Clearly if maps such as the ITMA 1968 and the GMA 1963 are to be revised, or new geological maps of Africa are to be produced, then this should be done through the national committees of the International Union of Geological Sciences which consist of representatives of the national surveys, universities, the mining and petroleum industries. A more representative view of African geology will then be obtained.

Yours faithfully,

A. J. WHITEMAN

Department of Geology,
University of Ibadan,
Ibadan,
Nigeria.

¹ Said, R., *The Geology of Egypt* (Elsevier, 1962).

² Picard, L., *Intern. World Rift System*, Geol. Surv. Canada Pap. 66-14 (1965).

³ Whiteman, A. J., *Geol. Mag.*, **105**, 231 (1968).

⁴ Kostandi, A. B., *First Arab Petrol. Cong.*, **2** (1959).

⁵ Beydoun, Z. R., *The Stratigraphy and Structure of East Aden Protectorate* (HMSO, London, 1964).

⁶ Cahen, L., and Snelling, N. J., *The Geochronology of Equatorial Africa* (North-Holland, 1966).

⁷ Whiteman, A. J., *Geology of Sudan Republic* (Khartoum, 1965).

⁸ Whiteman, A. J., *UNESCO Seminar East African Rift System*, Nairobi, 34 (1965).

⁹ Almond, D. C., *Geol. Mag.*, **104**, 1 (1967).

Worcester Foundation Marks Time

SIR,—The article in the April 19 issue of *Nature* (222, 216; 1969) gives a somewhat misleading picture of the Worcester Foundation for Experimental Biology. We are especially unhappy about the headline, "Worcester Foundation Marks Time". Since no mention was made of the present administration and direction of the foundation, I would like to comment on it.

Gregory Pincus and I were co-founders in 1944 and co-directors with equal seniority at the Worcester Foundation. We both directed research programmes and were responsible for the overall administration. I had planned to retire in 1968 at the age of 68, and Dr Pincus, three years my junior, planned to continue until 1970. We had agreed, with our trustees, on a new executive director, Mr Mason Fernald, and had engaged him to come to us on January 1, 1968. For the previous seven years he had been administrative director of research and development for the pharmaceutical firm of Smith, Kline and French, and was thus experienced in administering large research programmes. His department at Smith, Kline and French was over three times the size of the Worcester Foundation.

Mr Fernald came to us in September of 1967, immediately following the untimely and unexpected death of Dr Pincus in August of that year. I was asked to remain as president of the foundation for an additional year, retiring January 1, 1969. Mr Fernald has proved to be an excellent administrator and he appointed an advisory council of

some of our distinguished senior scientists to function as a scientific directorate. This directorate includes M. C. Chang, PhD and ScD (Cantab.), and James Tait, FRS.

Recently Fernald and his advisers have felt that it would be desirable to bring a research director here and accordingly a search is under way for such a man. While we have several on our staff who are well qualified for this post, it was agreed to seek someone from outside.

Dr Pincus's death and my retirement have occurred at a period when government research funds in this country have been reduced compared with the previous two decades. This has resulted in some reduction in support of biomedical research both here and at other institutions. But we do not feel we are "marking time" in that there has been no serious curtailment of any of our programmes and we have increased our teaching from two postdoctoral training programmes to three during the past two years. Moreover, from legacies, our endowment, while small, has tripled in the past two years.

It might be said that all life science research in America is marking time compared with the booming period of the fifties and early sixties when the Congress greatly increased its annual research appropriations to our National Institutes of Health, but this would be a gross exaggeration, for curtailment of government funding is reflected not so much in reductions of appropriations by Congress as in the fact that appropriations have not increased annually at the rate they did in the past. Inflation, government economies and increasing numbers of scientists entering the field have reduced the formerly rapid growth of biomedical research.

The Worcester Foundation has fared as well as most of our major universities in terms of grant support. Our research programmes are going well and we are optimistic about the future.

Yours faithfully,
HUDSON HOAGLAND

Worcester Foundation for
Experimental Biology,
Massachusetts, USA.

Continental Drift

SIR,—I think that a time has come when some protest must be made against the biased propaganda in favour of continental drift. The Science Report in *The Times* for March 17 begins with the words: "Now that it is universally accepted that the continents have in the past drifted apart and that the movement is continuing in many places . . .". There have been several similar statements in the Press containing the words "universally" or "unanimously". They are false. Many noted geophysicists are unconvinced. Some criticisms of the evidence and of the alleged mechanical explanations are in two lectures of mine^{1,2}, the second of which gives references. The main point is that there is now overwhelming evidence for a law of imperfection of elasticity at small stresses that forbids convection and continental drift, and explains several well established facts that supporters of continental drift have totally neglected. No reply to the arguments has been offered, and the evidence is now stronger than when these lectures were delivered. The only law that permits either convection or continental drift, when applied to other phenomena, requires values of the viscosity differing by factors up to 10⁹.

Yours faithfully,
HAROLD JEFFREYS

St John's College,
Cambridge.

¹ Jeffreys, H., Presidential Address to the Association of Seismology and Physics of the Earth's Interior, Helsinki, 1960.

² Jeffreys, H., *Quart. J. Roy. Astro. Soc.*, 5, 10 (1964).

University News

Professor A. S. Breathnach has been appointed to the chair of anatomy at **St Mary's Hospital Medical School**, University of London.

Professor Hugh Ford has been appointed to the chair of mechanical engineering at **Imperial College of Science and Technology**, University of London.

Professor J. M. Alexander has been appointed to the chair of applied mechanics at **Imperial College of Science and Technology**, University of London.

The title of professor of insect physiology has been conferred on **Dr A. D. Lees** in respect of the post held by him at **Imperial College of Science and Technology**, University of London.

Professor A. Fröhlich has been appointed to a chair of mathematics at **King's College**, University of London.

Professor R. E. Steiner has been appointed to the chair of diagnostic radiology at the **Royal Postgraduate Medical School**, University of London.

Dr S. S. Schwartz, New York University School of Medicine, has been named professor of radiology and chief of the section of diagnostic radiology at the **Yale School of Medicine**.

Appointments

Dr R. L. Ringler has been appointed deputy director of the **National Heart Institute, Bethesda, Maryland**.

Dr J. L. Locke has been appointed assistant director of the Radio and Electrical Division of the **National Research Institute of Canada**.

Professor G. B. Kistiakowsky, Harvard University, has been elected to a second term as vice-president of the **National Academy of Sciences**.

Mr J. M. Cameron has been appointed chief of the newly formed Office of Measurement Services in the Institute for Basic Standards at the **National Bureau of Standards, US Department of Commerce**.

Announcements

Academician V. A. Ambartsumian, director of the Burakan Astro-Physical Observatory and president of the Armenian SSR Academy of Sciences, **Dr Inge Lehmann**, formerly chief of the seismological department of the Danish Geodetic Institute, **Professor A. S. Romer**, emeritus Alexander Agassiz professor of zoology, Harvard University, and **Professor K. V. Thimann**, professor of biology and provost of Crown College, University of California, have been elected **Foreign Members of the Royal Society**.

The **Paul Instrument Fund Committee**, composed of representatives of the Royal Society, the Institute of Physics and the Physical Society and the Institution of Electrical Engineers, has made grants to **Professor J. B. Chappell** and **Dr A. R. Crofts**, University of Bristol, for the construction of a recording spectrophotometer with double-beam and split-beam facilities, a rapid time resolution and attachments for fluorimetry and actinic illumination; to **Dr P. J. Kennedy**, University of Edinburgh, for the construction of a solid state source capable of providing highly polarized high current electron beams for experiments in spin dependent collision experiments; and to **Mr A. R. Luxmoore**, University College of Swansea, for the completion of the construction of a moiré-scope and for the extension of means of measuring in-plane strains by using holographic methods.

Former **Senator Lister Hill** of Alabama has been awarded the **Public Welfare Medal** of the National Academy of Sciences for his services in the application of sciences to public welfare.