have any close resemblance to reality, it was not put forward as such, but as a theory of the origin of mountains.

It is only in recent years that the Airy hypothesis has received attention. One reason for the long life of the impossible Pratt–Hayford–Bowie hypothesis seems to be that the actual effects on the surface are not as greatly different with the different hypotheses as might be expected, since the centres of gravity of the supposed compensating masses must lie at a very great depth beneath the surface. But a more important reason is probably the failure of geologists to take an active interest in the development of the idea of isostasy, leaving it to mathematicians, who seem not to have been encouraged to find out whether their postulates were geologically possible.

Although geodetic computations (designed to ascertain how nearly the earth's crust is in isostatic equilibrium) appeared to show that gravity anomalies could largely be accounted for by the postulated compensating masses beneath the mountains, some relatively small and a few fairly large anomalies remained after applying the correction for isostatic compensation. It was, however, widely assumed that these could be accounted for by variations in the surface rocks, as, for example, the contrast between light alluvial sediments and dense lava flows. None of the geodetic calculations had made any allowance for this factor, in spite of the protests of the American geologists G. K. Gilbert and David White. Later, R. T. Chamberlin, E. A. Glennie and others were not satisfied that allowance for local geology would get rid of the gravity anomalies, and the matter was clinched by the extensive gravity surveys of Vening Meinesz and others which revealed very big anomalies clearly defying any such simple explanation.

Until recently, no attempt had been made to evaluate the gravitational effects of surface rocks in a large area where a great thickness of sediments is present, but this has been done in an extensive gravity survey (carried out by the Burmah Oil Co., Ltd., and associated companies) of parts of India and Burma, the results of which have been published by the Geological Society of London[1]. After an investigation into the probable effective densities of the relatively light Tertiary sediments of this region, appropriate corrections were computed by a method suggested by E. A. Glennie, and for the first time a gravity map of a large area was produced in which allowance had been made for local geological effects. Very large anomalies remained, and even when further corrections were made to allow for the hypothetical isostatic compensation, there were still large unexplained residual effects. This work strongly supported the contention of Glennie and others that, contrary to general belief, the gravity evidence from India taken as a whole does *not* support any hypothesis that the region is in isostatic equilibrium. It also demonstrated the possible magnitude of the effects arising from surface geology.

After the removal of these effects due to the known geological structures, the gravity irregularities attributable solely to deep-seated causes were found to have a distribution closely related to the principal lines of earth movement. The hills between Assam and Burma coincide closely with a belt of intensely folded strata, and this is marked by pronounced minimum values of gravity. To the east of this, a gravity maximum corresponds closely with a line along which volcanic activity has taken place in the not very distant past. The work in India and Burma links up closely with the large gravity anomalies found by Vening Meinesz in the Netherlands East Indies.

The Ganges–Brahmaputra, Irrawaddy, Mekong and Red River deltas all show gravity maxima if allowance is made for the effects of the light sediments composing these deltas. The Indus delta has been found also to be an area of relatively high gravity, and so have the Nile and Mississippi deltas.

Although there is no unique solution of a gravity picture, the magnitude of the broad regional gravity anomalies makes it possible to set limits to the nature of the masses responsible for the anomalous gravity values in south-east Asia. Seismic records have shown that an approximate representation of the earth's crust can be obtained by assuming three layers of increasing density, and it is clear that the excess of light material in the areas of relatively low gravity is due to the thickening of the upper layers at the expense of the lower ones.

These various recent investigations of gravity anomalies have shown: first, that the basic assumptions of the Pratt–Hayford–Bowie hypothesis are quite untenable; secondly, that allowance must be made for the effects of surface geology; and thirdly, that there are large areas of the earth's crust, particularly those where there has been recent mountain building, which are not in isostatic equilibrium.

It follows, then, that a device employed as a routine procedure by scientific workers concerned especially with measurements of the earth's crust is founded on a hypothesis which other scientific workers concerned especially with the structure of the earth's crust know to be wrong, and it is desirable to inquire why there should be this contradiction. It seems fair to say that the geologists have been at fault in allowing the mathematicians to develop the idea of isostasy in a manner which has been largely unprofitable—a result of lack of co-operation between groups of scientific workers of admittedly different temperaments. It is to be emphasized that, where a wide field of inquiry includes several separate compartments of science, progress will not be possible unless there is a partnership between men of quite different disciplines, and no fear of incompatibility of temperament between partners should be allowed to stand in the way of co-operation.

[1] Evans, P., and Crompton, W., "Geological Factors in Gravity Interpretation", *Quart. J. Geol. Soc.*, **102**, 211 (1946), which includes references to the authors mentioned above.

OBITUARIES

Mr. R. E. Enthoven, C.I.E.

REGINALD EDWARD ENTHOVEN, who died on May 21, had had a distinguished career in India both as a Civil servant and as an anthropologist. Educated at Wellington College and New College, Oxford, he entered the Indian Civil Service in 1887 when he was barely eighteen. He was posted to the Bombay Presidency, where most of his service was spent, though he acted during 1912–15 as Secretary to the Government of India in the Department of Commerce and Industry.

Quite early in his career, Enthoven published a monograph on the cotton fabrics of Bombay, and his interest in the sociological aspects of Indian life was shown very clearly in his "Report on the Census of Bombay, 1901". His work as census superintendent for that Presidency had been much impeded by

© 1952 Nature Publishing Group

famine and plague; but it was no doubt Enthoven's work on that census that led to his appointment as honorary superintendent of ethnography in Bombay, in which capacity he had charge of the ethnographical survey of the Presidency. This culminated in 1920 in the publication of his three volumes on "The Tribes and Castes of Bombay", a survey for which a small annual financial provision was made when the work started. This provision, however, was withdrawn in 1909 before the work was half done, and the task was carried to completion by the voluntary labours of Enthoven himself with such assistance as he could obtain without expenditure of funds. Crooke's "Tribes and Castes of the N.W. Provinces and Oudh", Risley's, Russell's, and Rose's similar volumes on Bengal, the Central Provinces, and the Punjab and North-West Frontier Province, and Thurston's "Castes and Tribes of Southern India", together with Enthoven's volumes on Bombay, all alike instigated in the first instance by Nesfield, Ibbetson and Risley, form the main corpus of information on Indian castes. But Enthoven, like Crooke and Thurston, went further and published in 1924 his volume on "The Folklore of Bombay", a very valuable continuation of the earlier work in the same field of Sir James Campbell, and a most important companion to the works of Crooke and Thurston. His interest in this aspect of Indian life had perhaps been kindled, or at any rate fed in him by an incident early in his career in which, as a junior magistrate, he was called upon to investigate the unnatural death of a girl as the result of an attempt to drive an evil spirit out of her by jumping on her and thrashing her.

In 1916 Enthoven got leave from India to take up a war-time appointment in the Board of Trade, where he became eventually controller of the department of import restrictions. He returned to India after the First World War, but retired in 1920 and became an underwriter at Lloyds. He was awarded the C.I.E. in 1920, and was also a Commander of the Order of Leopold II; but it is for his work on Indian ethnography and folk-lore that he will be best remembered.

J. H. HUTTON

Dr. A. Lasnitzki

DR. ARTHUR LASNITZKI, who died suddenly at Birmingham on April 18 at the age of fifty-six, was born in Lauenburg, Germany. After completing his early education he studied medicine with special training in chemistry, physics and mathematics at the Universities of Berlin and Bonn. His predominant interests were in the scientific aspects of physiology and biochemistry.

During 1921–25 Lasnitzki worked at the Universities of Rostock and Berlin, where he carried out investigations on the biological action of hydrogen acceptors and the nature of heterogenic precipitins. His wide knowledge of chemistry and physics proved of great value in his studies on the surface tension of tissue fluids and the absorptive capacity of hydrophyllic colloids. He also elaborated a manometric method for the determination of lipase in body fluids and tissues.

During the past twenty-five years he devoted his great abilities to the problem of cancer and the intricate nature of the cancer cell. From 1926 until 1933 he worked as head of the Biochemical Laboratory of the Cancer Research Institute, University of Berlin, where he carried out and directed studies on the metabolism and the influence of electrolytes on adult, embryonic and tumour tissues. In 1933, due to the Nazi oppression, Lasnitzki was dismissed from his post but found refuge at the University of Manchester, where he spent the next five years, working untiringly and in difficult circumstances. In collaboration with A. K. Brewer, of Washington, he was among the earliest to investigate the occurrence of isotopic and radioactive elements in tumour and normal tissues, in particular the significance of the shift of the isotopic potassium in neoplastic growth.

For the past fourteen years Dr. Lasnitzki had worked at the Medical School, Birmingham, continuing his biochemical studies and examining some aspects of carcinogenesis, particularly the histological changes in the lymph nodes of animals induced by carcinogenic hydrocarbons and extracts of cancer tissues. Much of this work is still unpublished, and some he had been unable to complete.

Dr. Lasnitzki always extended a warm-hearted generosity towards colleagues and friends who sought his help or advice. He was keenly interested in meetings of scientific societies and found great satisfaction in exchanging ideas with others on these occasions. He had a sensitive disposition, and occupied his mind with science almost to the exclusion of other sides of life. It was his high intellectual integrity which made him suffer intensely when he witnessed the decline of principles and standards he held dear. Though in failing health for several months, he had been drawing together results of his researches only a few hours before his death, with the meticulous care which characterized all his work.

He is survived by his widow, who has collaborated with him in a number of his researches.

Sir Algernon Aspinall, K.C.M.G., C.B.E.

SIR ALGERNON ASPINALL, secretary of the West India Committee for forty years, until his retirement in 1938, and of the Imperial College of Tropical Agriculture, British West Indies, from its foundation until 1940, recently died at the age of eighty. Himself not a man of science—he was called to the Bar in 1897—Sir Algernon was one of those who did much to promote the cause of science in its application to the problems of tropical agriculture. His work in connexion with West Indian agriculture, in particular with sugar and cocoa, and in relation to the founding and management of the affairs of the Imperial College of Tropical Agriculture—the recognized centre for postgraduate training for the Colonial Agricultural Service—will long be remembered with gratitude and respect by those who undertook the actual work on the spot. His keen personal interest in, and appreciation of, their efforts and the warmth of his welcome on their return to London were palpable factors in building up the tradition of sound scientific endeavour in the tropics. Sir Algernon is well known as the author of several guide and other books on the West Indies. These reflect the man . they are learned, friendly, witty and urbane.

WE regret to announce the following deaths:

Prof. H. A. D. Neville, C.B.E., emeritus professor of agricultural chemistry in the University of Reading, on June 17, aged seventy-one.

Sir Lindsay Scott, K.B.E., president during 1946–50 of the Prehistoric Society, on June 17, aged fifty-nine.

© 1952 Nature Publishing Group