

AGE OF THE EARTH

Scientists Set It At 3,000 Million Years

DEFINITE EVIDENCE

Fascinating Article By Sir Edgeworth David

Sir Edgeworth David, the famous geologist, who left Adelaide yesterday after a visit to study fossils, believed to be six or seven million years old, at Teatree Gully and Beaumont, tells in this article of the definite results rewarding the studies of modern physicists and astronomers of the age of the earth, which is now considered to be 3,000 million years old.

By Professor Sir T. W. Edgeworth David

Much light has been thrown lately on the subject of the age of the earth, from two independent sources—the researches of Baron de Geer and Dr. Caldenius, of Stockholm, and radioactive researches.

While geological dates cannot be fixed with extreme precision, Baron de Geer is confident that he can fix the date of the end of the last great Ice Age through which the world has passed as having taken place in Sweden 8,500 years ago. He considers this date correct to within about 100 years.

This calculation was made chiefly at Lake Ragunda, near the border of Sweden and Norway. This lake was formed by the very last of the former great ice sheets, which filled the Baltic Sea and covered much of Denmark and Northern Germany. It left a moraine dam across the valley, where is now Lake Ragunda, and as the ice retreated its thaw waters formed the lake on the upper side of the moraine dam. Later the ice finally melted away.

Systematic Arrangement

Next, in quite modern times, a Swedish farmer cut an irrigation channel through the moraine. A heavy flood followed, with the result that a torrent poured through the irrigation channel, and before it could be checked, cut a deep gap in the moraine and drained the lake.

It also channelled out a very deep trench, more than 40 feet deep, in the lake muds, which had accumulated since the close of the great Ice Age. De Geer found that these muds were systematically arranged in very thin paired sheets formed in this way:—The region is covered by snow in winter, when consequently, very little mud comes into the lake, and what does come is of a pale tint and devoid of the any leaves from trees, &c. On the other hand, as the snow melts away in the early summer, there is much greater drainage into the lake; consequently a thicker layer of mud forms, somewhat darkened by leaves of trees blown in from the now snow-free land surface. Remains of insects, too, are frequently present in the summer layer.

De Geer now made the thrilling discovery that each of these paired layers represented exactly one year, just as each of the concentric rings of growth of a tree, such as an oak, indicate the annual amount of growth.

Each Pair Represents Year

By counting the rings we may safely conclude that the tree is, say, 800 years old; moreover, we can tell from the width of any annual ring whether it was formed in a good season, or in a drought.

Thus, concentric rings of growths in trees are not only time-records, but meteorological records also; and it is just the same with the paired laminae or "varves" as de Geer called them, of Lake Ragunda. Each pair represents one year, and in wet years the varves are thicker than in the drier years.

De Geer was able to count, partly at this lake, partly in a neighboring valley, no less than 8,500 of these paired varves. This gave him, in 1926, the important date for the end of the last Ice Age—namely, 8,500 years ago. There is a stupendous partial meteorological record for Sweden extending over 8,500 years.

De Geer lately extended his observations to the varves in both North and South America, and has obtained dates, for the end of the Great Ice Age

in those continents, similar to those for Sweden.

De Geer has just written to inform me that at the end of this year his colleague, Dr. Caldenius, will visit New Zealand to count its varves, and Tasmania also, for both countries were heavily glaciated during the last Great Ice Age, and have "varves" extensively developed.

Australian Records

Australia passed through the same Ice Age, but, with the exception of Mount Kosciusko, was not sufficiently glaciated to produce varves of any consequence as far as we know. Australia, however, possesses some extremely old varves of quite extraordinary interest.

The first of these is situated in some old fine sandstone-like to clayey rocks on the Finnis River, near Mount Magnificent. The varves observed there by Sir Douglas Mawson date back to a little before the time of our productive coal-measures of Newcastle and Maitland in New South Wales, of the order of 200 millions of years ago, a time when quite half of Australia was under such a vast ice sheet as to have resembled Antarctica.

A still older series, to be specially studied by Dr. Caldenius, occurs at Seaham, to the north of Newcastle, New South Wales. These annual pairs of varves are exquisitely preserved, belonging to a still older ice age, perhaps about 230 millions of years ago.

Lastly, in the Adelaide region and the Flinders Ranges there are, perhaps, the oldest known varves in the world—those of Tapley's Hill, Boolcamata in the Olary district, in the Poolamacca region north of Broken Hill, and so on. These varves belong to that stupendous ice age, the evidence of which has been so admirably worked out by Professor Howchin.

Sir Douglas Mawson was the first to call attention to the varve-like character of the Tapley's Hill slaty shales in 1907, the first record of varves in Australia. These varves are perhaps about 550 million years old.

Primitive Fossils

The very primitive fossils at Goldsack's quarries, Beaumont, are still older, and those at Teatree Gully older still, the latter perhaps 600 to 700 million years old.

Already animal life on the earth was considerably differentiated, large sand-worms and lobster-like animals dominating the marine animal life of that time.

On the theory of evolution, such highly organised animals would already be at least two-thirds of the way up the column of life upon the earth. If, therefore, the age of the Teatree Gully fossils be about 700 million years, the beginning of life on the earth would be roughly about 2,000 million years ago.

Evidence From Meteorites

How far does this agree with the conclusions of physicists and astronomers? It has been pointed out to me by Professor Kerr Grant, of the physics department, and Mr. A. R. Alderman, of the geology department of the Adelaide University, that the radio active evidence, derived from the ratio of the proportion of the gas helium in a meteorite to the radium, shows that some meteorites, like the Thunda meteorite of New South Wales, are about 2,800 million years old.

It will be of great interest to see what conclusions Professor Paneth, of Konigsberg, Germany, will form as to the age of the Henbury meteorites from the remarkable craters in Central Australia. He has been supplied with a number of specimens by the South Australian Museum.

It is reasonably assumed that such old meteorites are parts of the original swarms of meteorites from which the earth, in common with other members of the solar system, was evolved.

It is now assumed, on other grounds as well, that the earth is, roughly, about 3,000 millions of years old.

It is surely uplifting and inspiring to contemplate the amazing triumphs which are crowning the intensive studies of modern physicists and astronomers.

Adv. 22-10-32

RHODES SCHOLARSHIP

Mr. F. W. Eardley, Registrar of the Adelaide University, has received several nominations for the 1932 Rhodes scholarship. The successful candidate will not be known until about the end of November.

The Advertiser

ADELAIDE: FRIDAY,
OCTOBER 21, 1932.

STANDARD OF DENTISTRY

Parliament is being invited to stultify itself once more by amending the Dental Act, which has been tampered with repeatedly already in the interest of dental operative assistants. In 1930, and again last year, Parliament went to great lengths to smooth the way for the entry of these assistants into the dental profession. The would-be dentists then complained that the examination set for them by the Dental Board was so severe as to exclude the possibility of their passing. If there was any reason for the earlier complaints that operative assistants were being ungenerously treated, there can be none now. There is no conceivable excuse for a proposed enactment to relieve them of the obligation to pass the modified examination required by the 1931 amendment. The public has the first right to consideration in this matter. Dentistry is now a highly specialised science, and anything which tends to detract from the standard of knowledge and skill of the registered dental surgeon, will endanger the health of the community.

The present Bill implies that injustice is being done to operative assistants in the interests of those who fit themselves for the dental profession by taking the prescribed course. This is far from being the fact. When, in 1917, the Legislature set a standard for the practice of dentistry in South Australia, it had the public in mind, and not the dentists. The maintenance of this standard has since been insisted upon in the case of those who enter the profession along the hard road of the full course of study; but one concession after another has been made to others who travel by an easier route. Twenty-one candidates sat for the modified examination in May last, and two passed. The others have the right to try twice again; and, if still unsuccessful, they may, at any time within ten years, take the shortened Dental Board course, with notable concessions not available to other students. This is not enough for the sponsors of the Bill now before the Legislative Council, who would admit the unsuccessful examinees to registration without further ado. Small wonder that the dental students, who are devoting years of their lives to the duty of preparing themselves for the practice of their chosen profession, should ironically enquire whether, if they fall in the coming examinations, Parliament will override the University examiners.

Adv. 24-10-32

EXHIBITIONS AND BURSARIES

Twenty-four intermediate exhibitions and 12 Government bursaries are offered annually for competition on the results of the intermediate and leaving honors examinations of the University respectively. The intermediate exhibitions are valued at £20 a year, and are tenable for three years at a Government high school or other secondary school approved by the Minister. If it is necessary for the exhibitor to board away from home to attend the selected school a board allowance of £20 a year will be paid. The Government bursaries exempt holders from all fees other than fees for supplementary examinations payable to the University of Adelaide in the various courses. In addition, a maintenance allowance of £20 a year will be paid to each bursar, and, in the case of a bursar who cannot receive the benefit of his bursary if he resides with his parents or guardian, the maintenance allowance will be increased to £40 a year. The Thomas Price scholarship, which is awarded once in four years, is open for competition this year. This scholarship, which is awarded on the result of the leaving examination of the University, is valued at £300, and is tenable for four years at the University of Adelaide. Applications from intending competitors must be received at the Education Department on or before October 31, and must be on the official form.

Adv 24-10-32
PROTEST AGAINST
DENTISTS BILL

"Source Of Danger To Public"

A statement protesting against the Dentists Act Amendment Bill was made by students at the Dental Hospital on Saturday morning. The Bill has passed the second reading stage in the Legislative Council, and the third reading is set down for tomorrow. The statement sets out that Mr. Tassie (L.C.P.), who introduced the Bill, apparently thought candidates had been suppressed in their first attempt at the modified examination under the Act of 1931, and that the candidates would suffer if the Bill were delayed. This was not so, as under the existing Act candidates had two more chances to satisfy the examiners. The first chance would come in a few weeks.

It was incorrect to say that Drs. Edwards, Moore, Draper, and Campbell, and Mr. Begg were examiners appointed by the board. Dr. Campbell and Mr. Begg had no association with the board; they were University examiners. There was no talk of suppression in 1931, when the five undergraduates doing the first year B.D.S. course all failed.

The statement ends with the question, "Why open such a source of danger to the public by allowing a body of men with a false status to enjoy the privileges earned by persons with the proper qualifications?"

Adv. 24-10-32

"POLITICAL DENTISTS"

DANGERS OF LOWERED STANDARD

To the Editor

Sir—The first Dental Act in South Australia was passed in 1902. It registered all those who were bona fide engaged in the practice of dentistry at that time, and the 1904 Act defined a course of study for those who were to enter the profession thereafter. A comparatively small percentage of the dentists now in practice fulfilled these requirements. About 30 have taken a degree in dentistry at the Adelaide University since 1919; and about 60 of the dentists registered since 1917 have been placed upon the register by Act of Parliament "through the back door." It is to be noted that all amendments of the Dental Act have been through the influence of so-called operative assistants, who would not, or could not, pass the approved standard prescribed by Act of Parliament.

It is generally recognised that the dental services received by patients have a most important bearing upon their general health, and that the standard of dental training has been raised considerably because of this. If increasingly large numbers of persons are to be permitted to practise dentistry on a standard absurdly lower than that required in 1904, and without any prescribed theoretical training and examination whatsoever, the general standard of dental services to the community is necessarily lowered.

The teeth of the Australian people are notoriously bad, and the percentage of young adults who have lost them (necessitating the use of artificial substitutes), is abnormally high. The relationship between bad dentistry and obscure and intractable bodily diseases is so well established that it is to be hoped that the astounding concessions being asked for by the 1931 batch of political dentists will not be granted.—I am, Sir, &c.

R. RAY NEWLING, D.D.S.

North terrace, Adelaide.

NO LOWERING OF STANDARD

Sir—As the extravagant and hysterical statements made by certain members of the dental profession with regard to the Bill introduced last week by Mr. Tassie, M.L.C., do not deal with reasons for this fresh legislation, and may create a wrong impression, the following facts will clarify the position:—

Clause 2 of the amending Dental Bill provides for the registration of those operative dentists who had been practising dentistry for at least six years at the time of the passing of the 1931 Act. The English Act of 1921, and the Victorian Act of 1928, are precedents for this clause. Clause 7 of the Bill provides for licensed operative assistants (those with less than six years' experience) being registered on passing the same examination before Dental Board examiners as that set out in the English Act of 1921. It is, therefore, obvious that the Bill now before Parliament is not lowering the standard of dentistry in this State. Indeed, the standard in England is higher than here, and the two clauses in the Dental Bill are taken from the English Act. The