

or three years at the most but here is the tragedy of the life of Innes. For sixteen years he was fretting and chafing at the delay, for his telescope was not erected complete with the object glass fitted until April 1925, only two years and nine months before his retirement at the age of sixty-six years.

Innes's first communication made to the *Monthly Notices of the Royal Astronomical Society* was to correct a computational slip in Laplace. From Sydney there followed two others on the secular perturbations of the orbit of the earth by Mars and by Venus, and by a third on the methods of Gauss. It was from New South Wales too that he published his first discovery of 26 new double stars using a 6-inch equatorial without circles. This result of thirty hours observation, "will prove what a mine of wealth awaits the diligent double-star observer in the southern hemisphere". Prophetic words, for ultimately his own doubles numbered 1,200. Next at the Cape he observed  $\eta$  Argus and in a few years discovered 285 new doubles and published his catalogue of southern double stars. Besides this work he contributed two papers to the *Monthly Notices* on multiple systems, and a very notable communication on Jacobi's 'Nome' as a means of computing elliptic integrals.

At Johannesburg Innes established his well-known Circulars which contain the records of much of his work—but the *Proceedings of the Royal Society of Edinburgh*, *Astronomische Nachrichten*, and *Astronomical Journal* contain papers of value. His interest in celestial mechanics continued unabated but of necessity other subjects demanded and received due attention—to mention a few: Jupiter's Galilean satellites, galactic co-ordinates, variable rotation of the earth, occultations and their reduction by improved methods, continuation and completion of the work of Franklin-Adams, use of blink microscope, the invariable plane of the solar system, a new catalogue of southern

double stars, and comet orbits. It was a proud day for Innes when the University of Leyden gave him the D.Sc. (*honoris causa*) and of all his work perhaps his discovery of Proxima Centauri pleased him most.

Innes was a good friend and the wide extent of his generosity is barely suspected. In spite of his advancement, he remained to the end absolutely simple, approachable and unaffected and apparently unaware of the high regard in which he was held. Deeply interested in the work of others, he himself worked until the day of his sudden and quite unexpected death on Monday, March 13. FRANK ROBBINS.

WE regret to announce the following deaths:

Lieut.-Col. A. W. Alcock, C.I.E., F.R.S., professor of anthropology in the London School of Hygiene and Tropical Medicine and professor of medical zoology in the University of London, from 1919 until 1924, formerly superintendent of the Indian Museum and professor of zoology in the Calcutta Medical College, known for his work on Crustacea and deep-water fishes, on March 24, aged seventy-three years.

Mr. James Groves, an authority on the *Charophyta*, on March 20, aged seventy-five years.

Prof. Friedrich Rinne, formerly professor of mineralogy and petrography in the University of Leipzig, author of many works on crystallography, on March 12, aged seventy years.

Prof. Edwin C. Starks, associate professor of zoology in Stanford University, California, who was a corresponding member of the Zoological Society of London, aged sixty-six years.

Prof. J. Millar Thomson, F.R.S., emeritus professor of chemistry at King's College, London, president of the Institute of Chemistry of Great Britain and Ireland in 1900-3, who was known for his work on the chemistry of ancient glasses, chemistry of pigments, etc., on March 22, aged eighty-four years.

## News and Views

### Early Man in East Africa

WHILE it is no longer possible on the latest interpretation of the evidence to accept the very high antiquity of Oldoway man, there appears elsewhere in this issue of NATURE (p. 477) a series of reports on the further evidence collected by Dr. Leakey in the spring of last year (not "autumn" as stated inadvertently in our note last week) which points to the early appearance of *Homo sapiens* in East Africa. We publish in full the reports of four committees, each dealing with one aspect of the evidence, presented to, and adopted by, the Royal Anthropological Institute's conference at Cambridge. The material which the committees had before them was derived from deposits at Kanjera and Kanam, two sites, about three miles apart, near Kendu, at the north-east of Victoria Nyanza, an area of old lake-beds,

well-known for its fossiliferous deposits. It comprised a part of a femur and fragments of human skulls of three individuals from Kanjera, of which one group formed a skull-cap, and a second permitted a reconstruction of the skull, and of a small fragment of human mandible from Kanam, fossil animal remains, including a considerable proportion (which has been put so high as fifty per cent) of specimens belonging to extinct forms, and two stone industries, one a pebble industry and the other Chellean. It is to be noted that at Kanjera, while the human bones comprising two groups had been washed out by the rains, two fragments of the third group were found *in situ* in association with fossil animal remains and Chellean tools. Further, the Kanam fragment of mandible was found not far from a pre-Chellean stone implement.

IN considering the findings of the committees, it must be borne in mind that the geological evidence, more especially in its stratigraphical aspect, is crucial. Several members of the geological committee have visited the sites personally and concur with Dr. Leakey in his view that after the Kanjera and Kanam deposits had been laid down there was great local tilting and volcanic activity. The committee "does not believe that the [skeletal] fragments can have been introduced into the calcareous deposit at a later date . . . the two fragments said to be found *in situ* belong in fact to the original deposit". The palaeontological committee finds that the fragment of human jaw from Kanam was associated with a fossil fauna which justifies its reference to the lower Pleistocene, while the Kanjera fauna "cannot be later than the middle Pleistocene". Thus from these two findings it appears that the human remains are referable on both geological and palaeontological grounds to lower and middle Pleistocene dates. As to the character of the human remains, the report of the anatomical committee is not unfavourable to their high antiquity, so far as can be determined by their condition, points out the absence of Neanderthaloid characters, and, while adverting to the abnormal thickness of one of the skulls, sees no feature inconsistent with their inclusion in the type of *Homo sapiens*. On the archaeological evidence, the human skeletal remains, thus regarded as within the category of 'modern man', are associated with what for this purpose may be termed a pre-Chellean, and a Chellean industry, which are equated with the cultures of Europe of like character through the Oldoway series. The latter are said to be of equal or somewhat greater antiquity than those with which they are comparable in Western Europe. It is to be noted that, archaeologically, the association of the Kanam jaw fragment with a pebble industry assigns it to Oldoway I, a stage earlier than that with which Oldoway man was originally associated—the later phase of Oldoway II.

#### Control of the Tsetse Fly

ONE of the most terrible scourges of Africa is the disease known as sleeping sickness, which is caused by a trypanosome, a blood-parasite, carried and spread by two species of tsetse fly. Hence there was a large gathering of the fellows at the meeting of the Zoological Society on March 21 to see the film exhibited by Mr. R. W. Harris, who showed what is being done by the Government entomologists to mitigate, if not terminate, the ravages of this insect. Since this war of extermination has to be carried on over millions of square miles, any such campaign might seem hopeless. But it was made manifest that, in so far as Rhodesia is concerned, a considerable measure of success has been attained. This has been done by the use of an ingenious trap devised by Mr. Harris's father, Mr. R. H. T. P. Harris. The trap is made of canvas; box-like in form, and much wider at the top, it is mounted on four legs, keeping it well off the ground. In bulk it is roughly of the size of, say, a small antelope. The flies are not very

discriminating, and on sighting this canvas 'stalking-horse' alight on it, and crawl down according to their habit, to reach the shaded under-side, there to suck the blood of their prospective victim. Their exploration is thorough, but fruitless. But presently, they find a long slit through which daylight appears, entering from a special cage at the top. They at once pass through, and upwards, into what they take to be the daylight and freedom beyond. Passing into this light-filled cage they are unable to escape. Enormous heaps of flies were shown which had been taken from this trap. Yet another trap was shown designed to induce the flies to deposit their larvae therein. Millions of pupæ are taken in this way.

DR. BEVAN joined with Major Austen, who forcefully reviewed the main results of this work at the end of the paper, by deploring the efforts which have been made to control the tsetse fly by killing off big game animals. More than 15,000 head of game in one year were slaughtered to this end. This takes no account of the numbers which died from wounds, owing to the lack of skill of the natives armed for this purpose. This state of affairs has fortunately been stopped, for a period at least, owing to the need for financial economy. It is the more deplorable because, as Major Austen and others have shown, if the very last of the big game animals of Africa was wiped out, sleeping sickness would still remain, since there are numerous small animals which also act as hosts for the trypanosome concerned. Even now, considerable misapprehension exists as to tsetse flies. Commonly one hears of *the* tsetse fly. As a matter of fact there are twenty species, all of which feed on blood. Only some of these depend for their food on game animals. *Glossina palpalis*, carrying *Trypanosoma gambiense* and *G. morsitans*, carrying *Trypanosoma rhodesiense*, are the most formidable of sleeping sickness disseminators. But, as Duke and Swinnerton have shown, in certain circumstances, *G. swynnertoni*, closely allied to *G. morsitans*, may also cause human trypanosomiasis, or sleeping sickness. Dr. Bevan gave a most helpful and interesting summary of what is being done in the suppression of this scourge, and the methods adopted towards that end. It is devoutly to be hoped that his protest against the wholesale slaughter of game, as a means to that end, will now cease, since all the highest authorities agree that even if successful, it would be a futile measure. More than that, as evidence has already shown, it might lead to an aggravation of the evil.

#### The Kea Parrot

WHETHER or not we may be able to boast 'home-bred' keas depends on an experiment about to be made at the Gardens of the Zoological Society of London. An artificial cave is to be made in the parrot-house to induce, if possible, a pair of these birds to breed, and it may well be successful. The kea parrot of New Zealand was years ago to be found in large numbers. Then, unfortunately, it took to attacking sheep, tearing holes in the back to get at the flesh, with fatal results to the sheep. It