orbit has acceleration and radiates energy so that its motion dies away. The dying away of the motion of a circular row or ring of electrons in this way is excessively slow if the number of electrons in the ring is great and if the velocity is small as compared with the velocity of light (see J. J. Thomson, *Phil. Mag.*, December, 1903). In fact, the time required for the angular velocity to fall from a value slightly above the critical value required for stability to the critical value might easily be a matter of millions of years under certain conditions.

It is interesting to note, although perhaps useless, considering the widespread confusion of the fundamental ideas of thermodynamics, that this electron theory, pointing as it does to finite systems which apparently never can settle to thermal equilibrium, suggests a class of phenomena, sensible and *steady* phenomena too, which are on the wrong side of thermodynamics, that is, on the side opposite to mechanics; phenomena which are to be treated by developing a systematic theory of atoms as isolated systems and the subsequent merging of this systematic theory of single atoms into a statistical treatment of aggregates of atoms; but this is another story. W. S. F.

A HEAVY JAPANESE BRAIN.

THROUGH the kindness of my friend, Mrs. Helen H. Gardener, now in Tokio, I am able to publish the following extract from the post-mortem examination of Professor K. Taguchi, the celebrated anatomist, of the College of Medicine in the Tokio Imperial University. His death took place in Yumi-cho, Hongo, on February 4 of this year, and, in accordance with the terms of his will, his body was dissected by his colleagues at the college. Professor Taguchi is perhaps the first of his race to bequeath his body in this manner. His work on the brain-weight of the Japanese has been referred to by the writer in SCIENCE (September 18, 1903). His own brain is the heaviest on record among the Japanese, and in the list of eminent men throughout the world, whose brains have been weighed (107 in number) it occupies second place. Taguchi's brain-weight (1,920 grams or 67.7 oz. avoir.) exceeds the highest recorded Japanese brain-weight by 130 grams (or 4.5 oz.).

"Extract from report of the post-mortem examination of Professor K. Taguchi on February 5, 1904, in the Pathological Institute, Tokio, by Professor Dr. K. Yamagiwa:

"Age, 66 years.

"Body-weight, 49,000 grams.

"Brain-weight, 1,920 grams.

"Clinical diagnosis: Cirrhosis of the kidney.

"Anatomical diagnosis: Hypertrophy with dilatation of the left ventricle of the heart; endocarditis valvularis chronica fibrosa adhæsiva aortica; endocarditis valvularis chronica fibrosa mitralis; œdema pulmonum; hypostatic pneumonia of lower lobe of left lung; nephritis chronica interstitialis; cystic degeneration of the kidney; atheroma in the aorta." EDW. ANTHONY SPITZKA.

PROFESSOR RUTHERFORD ON RADIUM.

PROFESSOR E. RUTHERFORD, of McGill University, lectured before the Royal Institution on May 20, on 'Radiation and Emanation of Radium.' According to the London *Times*, the lecturer first showed the power of radium to excite phosphorescence and to discharge a charged electroscope, and then described the properties of the three kinds of rays which it had been found to give off. In addition it gave off an emanation which behaved like a gas and could be condensed by cold; it could also be secluded in the radium itself, and was liberated when the salt was dissolved in water. This emanation, though exceedingly minute in quantity, possessed three-quarters of the characteristic powers of radium and all its properties. If we could collect a cubic inch of the emanation, the tube that contained it would probably melt, while a few pounds would supply enough energy to drive a ship across the Atlantic, though each of those pounds would require 70 tons of radium to supply it. In regard to the process going on in the emission of the emanation, he advanced the theory that radium was continuously producing it, but that when produced, instead of remaining constant, it was continuously being changed into something else. He supposed that some atoms of the radium in some conditions be-

came unstable; then there was an explosion, and particles of matter were shot off at great velocities. There was a series of such explosions, due to atomic, not molecular, changes, and resulting in the formation of a series of transition elements. A mass of radium left to itself must therefore throw itself away; probably in about 2,000 years its radio-activity would fall to half value, and after 50,000 years it would cease to exist. It was therefore to be supposed, since radium was produced from minerals more than 50,000 years old, that it was being itself produced from something else, and was itself a transition element. A year ago to find evidence for this point of view did not seem a very promising task, but since then a great deal had been done. In the self-destruction of radium two things must be produced that were not radio-active—the α-ray and the final product. Now helium was always found associated with radium-minerals, and the suggestion that that gas was one of the products had been confirmed by Sir William Ramsay, who had shown that the emanation was able to produce helium from itself. Here there was apparently a definite case of transmutation, though not precisely of the kind sought after by the alchemists, but there was no evidence as yet that matter in general, apart from the radio-active bodies, was undergoing changes of this nature. Radium was distributed very widely over the earth; in fact, was present everywhere, though in exceedingly minute quantities. The question was thus suggested —How much heat were these minute quantities of radium able to provide, and could they account for the gradual increase of temperature found as we went deeper into the earth? The lecturer himself believed that the amount of radium present, uniformly distributed, would be sufficient to account for all the heat lost from the earth and would explain the temperature-gradient as measured to-day. In that case the date, as calculated by Lord Kelvin, when this globe would have so far cooled as to be uninhabitable might possibly be postponed for a few million years, and an end put to the troubles of the biologists and geologist about a little extra time in the past.

SCIENTIFIC NOTES AND NEWS.

The International Association of Academies met at London at the end of May as the guest of the Royal Society and the British Academy. The National Academy was represented only by its British foreign members. No information concerning the scientific work of the association appears to have been made public.

At a recent meeting of the Board of Managers of the New York Botanical Garden, Dr. D. T. MacDougal was advanced from the post of director of the laboratories to that of assistant director of the institution. Dr. W. A. Murrill was appointed assistant curator in charge of the fungi to take the place of Professor F. S. Earle, who recently resigned to take the position of director of the Estacion Agronomica of Cuba.

Dr. E. L. Greene, head of the Department of Botany of the Catholic University of America, has resigned to accept a position in the Smithsonian Institution.

Sir William Ramsay was elected an honorary member of the Bunsen Gesellschaft, at the recent meeting in Bonn.

Sir William Huggins has been elected an honorary member of the Royal Philosophical Society of Glasgow.

M. Bigourdan has been elected a member of the Paris Academy of Sciences in the section for astronomy.

Dr. E. Strasburger, professor of botany at Bonn, has been elected a foreign member of the Academy of Sciences at Christiania.

The New York *Evening Post* states that Professor Henry R. Mussey, of the University of Pennsylvania, has been engaged by the Carnegie Institution to make a special study of the iron industry in the United States.

Dr. H. Austin Aikins, professor of philosophy in Western Reserve University, has sailed for Europe on leave of absence for the coming year.

Mr. and Mrs. T. D. A. Cockerell will spend the summer in England; upon their return to