

tised in the arts, has had a surprisingly small share of the attention which has been paid to metals by numerous observers in recent times. Experiments made at the Mint² with coins and coinage alloys gave such remarkable results that the experiments were extended to pure metals, and have enabled a fairly complete account of the



FIG. 1.—Structure of pure gold after being rolled, $\times 11$.

course of events in annealing to be clearly stated for the first time. It appears, from a large number of observations, that at comparatively low temperatures metals and alloys, hardened by rolling or hammering, are in an unstable condition, and undergo a gradual change to the soft state. The old standard silver and gold trial plates, for

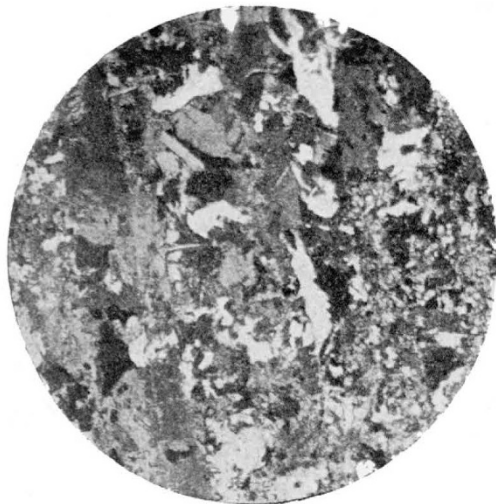


FIG. 2.—The same rapidly heated to 200° and quenched at once. $\times 15$.

example, have in the course of centuries, at the ordinary temperature, become almost completely softened, while lead appears to soften below the ordinary temperature. As the temperature rises the change is hastened, and a *critical range* is

² "The Annealing of Coinage Alloys," Journal of the Institute of Metals, September, 1912.

passed through, varying in extent for different metals, below which annealing is too slow for practical purposes, while above it metals and alloys revert from the hard to the soft state almost instantaneously. During the critical range, the time required for annealing undergoes a significant reduction with each slight increment in the temperature, while above and below the critical range, the change in the time is small even with great differences of temperature.

Pari passu with softening, recrystallisation takes place, not by diffusion, but by a change in the orientation of molecules *in situ*, as predicted by Dr. Beilby. When the softening is instantaneous, recrystallisation is almost, if not equally, instantaneous. Thus, for example, pure gold, which can be annealed in a few days in boiling water, softens at once at 200° , and the large primary distorted crystals (Fig. 1) break up simultaneously into smaller irregular ones (Fig. 2). The gradual growth of crystals, which has been studied by Ewing and Rosenhain and by others, takes place subsequently without much further softening.

T. K. ROSE.

INTERNATIONAL CONGRESS FOR GENERAL AND MEDICAL RADIOLOGY.

THE sixth meeting of the above congress was held this year at Prague, and was attended by a large number of scientific workers. This society has now a membership of 600, and embraces workers of many nationalities. The opening meeting took place in the Landes-Museum on October 3, and was attended by more than 2000 people. At this meeting addresses were given by Prof. Stoklasa, of Prague, who is president this year, and by Prof. Becquerel, of Paris. At the subsequent meetings of the congress, no fewer than 130 papers were read on physical, biological, and medical subjects. Among the excursions made by the members was one to the uranium mines of St. Joachimstal, from which most of the radium in use has been obtained.

The president chose for the subject of his address the action of the rays from radioactive bodies, and of ultraviolet light, on animal and plant organisms. In the first part of his speech he gave a short account of the development of our knowledge of the connection between electricity and life processes during the last two hundred years. He gave next a summary of the results of the last few years of the action of radium rays, and of ultraviolet light, on living organisms. The germination of seeds, and the development of fungi, flowers, and leaves, may be accelerated under certain conditions by these radiations, whilst, under other conditions, these processes may be entirely arrested. An intense source of α -rays from radium, for instance, has a destructive action on plant and animal organisms, while a weak source has a stimulating effect. The action of the more penetrating β -rays is similar to that of the ultraviolet rays of short wave length. These latter rays have a chemical action on the

mycoplasmas of bacteria and the protoplasts of plant and animal cells.

The president then gave an account of experiments of his own, in which he has shown that, under the action of the rays from radium emanation dissolved in water, seeds may germinate from two to three times as rapidly as they do in ordinary water. In other experiments he has shown also that, by acting on carbon dioxide and nascent hydrogen in the presence of ultraviolet light, a photosynthesis is effected resulting in the formation of formaldehyde, and this body itself, in the presence of potash, condenses to form a sugar. Further results indicate that photosynthesis in chlorophyll cells, and in nature generally, is due entirely to the action of ultraviolet light, or of the radiations from radioactive bodies. Chlorophyll, indeed, owes its properties to the fact that it is the medium through which these radiations act on the cells. Carbohydrates are produced in nature by the action of ultraviolet light on carbon dioxide and water, and, without this synthesis, all life in any form would be impossible.

Throughout his address Prof. Stoklasa emphasised the need of biologists and of physiologists for a better understanding of the newer developments in experimental physics. A. S. R.

SLEEPING SICKNESS IN THE KATANGA.¹

THE brochure referred to below contains the results of an investigation undertaken by the author into the distribution and other problems of sleeping sickness in the Katanga. His object is to consider the question from a general point of view and to collate the results of two years of work in the northern part of the province. He wishes to prove that "methodical work on the spot is the sole means of combating the evil in each district." If the differences presented by the districts "are lost sight of in attempting to put in practice measures prescribed in ignorance of the actual conditions, only negative, though costly, results can be obtained." With these objects in view, the author sets forth his observations upon the Katanga, its geography, commerce, and people, and upon the special problems of sleeping sickness in that country, such as the origin and progress of the disease, its diagnosis, treatment, and natural course, the distribution and occurrence of the transmitting fly, *Glossina palpalis*, and the results of administrative efforts to cope with the evil. His descriptions are supplemented by nine maps and a number of excellent photographs.

The author's attitude is mainly that of an independent observer offering gratuitous advice to the Belgian administration of the Congo; hence, doubtless, his choice of the French language for publishing his results. His foremost conclusion is that "the first thing to do is to publish the truth in Belgium"; the next, that as a necessary preliminary to efficacious measures, the zones of

¹ "La Maladie du Sommeil au Katanga." By F. O. Stohr (Oxon.) Pp. 83, with maps and illustrations. (London: Constable and Co., Ltd., 1912.) Price 4s. net

Glossina palpalis and sleeping sickness should be delimited accurately; and his third, that when the country has been carefully surveyed from this point of view the problem becomes administrative rather than medical. "For medical men the most simple and radical system of conquering the disease is to remove the people from the proximity of *G. palpalis*; it is for the administration to decide how far this is practicable." He is strongly against the treatment of the infected natives in isolation-camps, which he considers to be of little use, while difficult and costly.

NOTES.

THE King has approved of the awards this year, by the president and council of the Royal Society, of a Royal medal to Prof. W. M. Hicks, F.R.S., for his researches in mathematical physics and investigations on the theory of spectroscopy, and a Royal medal to Prof. G. Elliot Smith, F.R.S., for his researches on the comparative anatomy of the brain. The following awards have also been made by the president and council:—The Copley medal to Prof. Felix Klein, For.Mem.R.S., of Göttingen, for his researches in mathematics; the Rumford medal to Prof. H. Kamerlingh Onnes, of Leyden, for his researches at low temperatures; the Davy medal to Prof. Otto Wallach, of Göttingen, for his researches on the chemistry of the essential oils and the cycloolefines; the Darwin medal to Dr. Francis Darwin, F.R.S., for his work in conjunction with Charles Darwin, and for his researches in vegetable physiology; the Buchanan medal to Colonel William C. Gorgas, of the United States Army, for his sanitary administration of the works of the Panama Canal; the Hughes medal to Mr. William Duddell, F.R.S., for his investigations into technical electricity.

At the annual general meeting of the London Mathematical Society, held on November 14, the following were elected officers and council for the ensuing session:—*President*, A. E. H. Love, F.R.S.; *Vice-Presidents*, H. F. Baker, F.R.S., and J. E. Campbell, F.R.S.; *Treasurer*, Sir Joseph Larmor, M.P., F.R.S.; *Secretaries*, J. H. Grace, F.R.S., and T. J. I'A. Bromwich, F.R.S.; *Other Members of the Council*, W. Burnside, F.R.S., A. L. Dixon, F.R.S., L. N. G. Filon, F.R.S., J. H. Jeans, F.R.S., E. W. Hobson, F.R.S., J. E. Littlewood, H. M. Macdonald, F.R.S., P. A. MacMahon, F.R.S., H. W. Richmond, F.R.S., and A. E. Western.

At the anniversary meeting of the Mineralogical Society, held on November 12, the following officers and members of council were elected:—*President*, Dr. A. E. H. Tutton, F.R.S.; *Vice-Presidents*, Prof. H. L. Bowman, Dr. A. Hutchinson; *Treasurer*, Sir William P. Beale, Bart., K.C., M.P.; *General Secretary*, Dr. G. T. Prior, F.R.S.; *Foreign Secretary*, Prof. W. W. Watts, F.R.S.; *Editor of the Journal*, Mr. L. J. Spencer; *Members of Council*, Mr. T. V. Barker, Mr. W. Barlow, F.R.S., Mr. F. H. Butler, Mr. T. Crook, Mr. J. P. De Castro, Rev. J. M. Gordon, Sir Thomas H. Holland, K.C.I.E., F.R.S., Mr.