CALLOSITIES ON HORSES' LEGS.

To the Editor of Science: Your inquirer concerning the callosities on horses' legs might gain an indirect suggestion from Ernest Seton Thompson's 'Wild Animals I Have Known' or—still more probably—from the same author's recent articles in the *Century Magazine* on the National Zoological Park. The suggestion that these callosities are vestigial organs for the secretion of specific perfumes gains some indirect but interesting support from the use made of their material by Rarey and other professional 'horse-tamers.'

W J McGee.

NOTES ON INORGANIC CHEMISTRY.

In a study of the radiation of uranium, Becquerel finds that these rays are deviated in a magnetic field. When the uranium compounds are treated with barium salts and the barium then precipitated as a sulfate, the radio-activity of the uranium is decreased, but Becquerel has not been able in this way to obtain a uranium salt which does not show some activity.

A somewhat similar series of experiments is described by Béla von Lengyel in the *Berichte*. The barium sulfate obtained from the uranium mixture was found to be strongly radio-active, as well as the barium carbonate and chlorid derived from this sulfate. The author considers this synthesis of radio-active barium renders the existence of radium and polonium as elements exceedingly doubtful. This reminds one of the views of Le Bon that radium and polonium are merely allotropic states of barium and bismuth, corresponding somewhat to the inactive and the phosphorescent calcium sulfids.

Accounts have been published from time to time in the *Comptes Rendus* by Paul Sabatier and J. B. Senderens on the addition of hydrogen to acetylene under the influence of reduced metals in a finely divided condition. The action of copper, iron and cobalt have been most recently described, the union taking place below 200°. With copper, ethane, ethylene, and other hydrocarbons are formed, and if hydrogen is in excess no acetylene is unacted upon. With iron in addition to ethane and ethylene, benzene and higher unsaturated hydrocarbons are produced. Cobalt is found to give a much larger yield of ethane than nickel.

The direct preparation of a number of binary compounds of aluminum is described by Henri Fonzes-Diacon in the *Comptes Rendus*. The sulfid, selenid, phosphid, arsenid, and stibid are all formed by the ignition of a mixture of fine aluminum powder with the element in question. In the case of sulfur and selenium, a little burning magnesium is necessary to ignite the mixture; with antimony, sodium peroxid serves the same purpose. When these compounds are treated with water, the hydrogen compound is evolved in a very pure state. In the case of phosphid the yield of the non-inflammable gas PH_3 is practically theoretical, and the same is true of arsin. The yield of stibin is less good.

A recent *Bulletin* of the College of Agriculture of Tokyo, contains a paper by Dr. U. Suzuki on the possible replacement of calcium in plants by strontium and barium. From an abstract in *Nature* it appears that both strontium and barium salts are poisonous to plants, though the addition of lime salts lessens the poisonous action to some extent. This is apparently very different from the action on higher animals, where, though barium is strongly toxic, strontium has little if any toxic action.

From *Nature* we note also a short article by C. E. Stromeyer from the *Memoirs* of the Manchester Literary and Philosophical Society, on the Formation of Minerals in Granite. He concludes that the temperature of granite formation need not be limited, nor need the interior of the earth be assumed as solid. The mineral composition of granites depends not only upon temperature and rate of cooling but also upon pressure. "Where the solid rock resting on the molten material is of low specific gravity and a bad conductor of heat the depth at which granite rock would commence to solidify would not be great, and most probably the quartz would crystallize first, forming, say, quartz-porphyry." In somewhat opposite conditions, at greater depths and pressure the quartz would remain fluid longer, forming feldspar-porphyry. Every intermediate condition is also conceivable.

THE curious observation is made by P. Villard in the last *Comptes Rendus*, that at the temperature of 1000° fused silica, SiO_2, is permeable to hydrogen.

THE abstract of a paper read before the Chemical Society (London) by John Wade on the constitution of hydrogen cyanid, is given in the last number of the *Proceedings*. From reactions with alkyl iodids and sulfates, it has appeared as if potassium cyanid had the constitution KCN while that of silver cyanid is AgNC. Wade now shows that when potassium cyanid is heated with alkyl potassium sulfate at a lower temperature, the isomeric isocyanid is often the principal product. He further finds that practically all the isocyanids can be converted into cyanids (nitrils) by heat. Since the formation of nitrils in the above interaction is thus accounted for, one of the chief arguments for the nitrilic constitution, HCN, of hydrogen cyanid disappears, and it seems possible that HNC represents the constitution of the acid, and that all the cyanids have an analogous constitution.

J. L. H.

MEDICAL EXHIBITS AT PARIS.

THE Paris correspondent of the *British Medical Journal* gives the following account of some of the medical exhibits at the Paris Exposition:

In the Pavillon des Armées de Terre et de Mer, at the end nearest the Pont de l'Alma, we first enter the Salon Pasteur. On either side of the entrance are cabinets filled with cultures of different microbes. In the center of the room is the bust of Pasteur on a pedestal, round the base of which is an octagonal case containing a retrospective exhibition of the work of Pasteur. Here we see the manuscript of the thesis presented before the Faculty of Science in 1847 on molecular dissymmetry; the microscope used by Pasteur to measure the angles of crystals, and models of various crystals; his work on fermentation, with the original apparatus used for the study of butyric acid fermentation, and the apparatus for the study of living anaërobic microbes. Pasteur's researches on spontaneous generation are illustrated by the apparatus to prove that calcined air contained no germs, and the flasks used in the experiments on the organized dusts in the atmosphere, and opened by him on October 3, 1860, at the summit of Mount Poupet. In connection with his investigation into the diseases of wines and beer, flasks for the pure culture of yeast and experiments on the aging of wines are shown. The microscope used by Pasteur in his investigation of the diseases of silkworms is shown, together with baskets for rearing silkworms, chains of cocoons, and pigeon-holes for rearing isolated worms. Methods of sterilization are illustrated by the first model of the Chamberland autoclave used in Pasteur's laboratory, and by Chamberland filters. Virulent diseases are illustrated by the flask of putrified blood from which Pasteur obtained the anaërobic microbe which he called the 'vibrion septique.' U-shaped tubes from Pasteur's laboratory containing anthrax blood, with samples of the first and second vaccines against anthrax as supplied to veterinary surgeons are exhibited. Down to January 1, 1900, in France alone, 4,971,494 sheep and 708,980 cattle have been inoculated. Some manuscript notes by Pasteur on the experiments in his laboratory in 1881 on hydrophobia are shown, as are also his platinum spatula instruments for trephining rabbits and to remove the spinal cord, dried cords, etc.

On the right-hand of the Salon Pasteur is a model of the Pasteur Institute, with the recently completed Annexe of Biological Chemistry and hospital for hydrophobia and diphtheria patients. An adjacent glass case contains a bouillon culture of the bacillus of diphtheria in a large flat-bottomed flask, the trocar of Roux and Nocard with rubber tube to collect the blood from the immune horse, the jar in which the clot and serum separate; a small filter by L. Martin for experiments on the toxin, the large filter used to filter the cultures of diphtheria to prepare the toxin, the filtered culture, and bottles of the serum in liquid and dried form.

On the left-hand side is the exhibit of the Pasteur Institute at Lille, showing cultures of the plague bacillus of Yersin-Kitasato and the antiplague serum; venomous snakes, with Calmette's serum against snake bite; the sterilization of water by ozone, with numerous maps, plans and photographs of the Lille Institute.