home, on his field, in the midst of his family, his oxen and his sheep, his temple, his priests, his feasts and fasts and festivals as a man with virtues to praise and weaknesses to pity, the man as apart from the "guinea stamp" and who is "the gow'd for a' that". The group is very comprehensive; there are Afridis, Pathans and Baluchis, adepts with the gun as with the plough; there are other warrior cultivators, Panjabis, Jats, Scindhis, Moslems from the U.P.; there are the men from Assam, Bengal, Bihar, Orissa; cotton cultivators from the typical cotton tracts of the Berars and Maharashtra; Madrasis and Burmans; there are men wedded to the land and there are aboriginal tribes with their shifting cultivation; there are the prosperous looking men in very consequential attire and there are men exhibiting their manly frames as God made them; bright open faces of the boy cultivators alongside the furrowed crows'-footed faces of these old "horny-handed sons of toil", showing what this ancient craft can do to the "human face divine". What kind of house does he live in, what does he eat, how much or how often, what are his clothes, his furniture, his utensils, what is his daily routine, what are his amusements, his pleasures, his domestic cares, the codes of his caste or his religion, the customs at marriages, feasts or funerals—to these and similar questions the reader will find an interesting variety of answers. Not the least entertaining part of the answers is the lore of proverbs, which so pithily sum up the hoary wisdom of the cultivator, so helpful, so amusing and so illuminating. The womenfolk come in for a goodly share of the descriptions; they are worthy helpmates as much in the field as in the home, who are often shrewder and better able to drive a bargain than the brawny male. The book is illustrated with a fine set of photographs of the different types which lend very great charm to the book. As an entertaining little book on the ways of the Indian ryot and, we may add, of his wife, the volume is a little gem.

A. K. Y.

CENTENARIES

Paracelsus (1490-1541)

PARACELSUS, a German physician, was born in Einsiedaln about 1490. His surname was Hohenheim; but he gave it up for the one of his own making. At a comparatively early age he questioned what was taught to him in Medicine by his father and struck out new ways himself. He did similarly when he entered the university of Basel. He left school chemistry and started for the mines in Tirol and preferred to learn by going to nature herself. He then went wandering over a great part of Europe. The book of nature, he affirmed, is that which the physician must read. Though others called him an ignorant vagabond, he himself valued his knowledge differently and wrote "Whence have I all my secrets, out of what writers and authors? Ask rather how the beasts have learned their arts. If nature can instruct irrational animals, can it not much more men?" He had thus acquired great stores of facts which gave him an unquestionable superiority to his contemporaries. So in 1526, on his return to Basel, he was appointed town physician and a lecturer in the University.

He broke away from tradition. His lectures were in German and not in Latin. They were expositions of his own experience and of his own methods of curing and were not commentaries on the text of Galen. For a couple of years this new venture brought him reputation and practice. But in due course jealousy and enmity gathered sufficient momentum to drive him away and he ended his life in a miserable way.

For centuries he was evaluated in every possible way. But now it is acknowledged that his vigorous attacks on the degenerate Galenism of his day helped the foundation of modern scientific medicine. His *Chirurgia magna* went through ninteen editions and translations into several languages. He is credited with the discovery of the inherited characters of syphilis. He protested against the excessive blood-letting in vogue at that time. It is claimed that he was one of the first to bid modern Europe think for a moment upon the idea that diseases are inflicted neither by saints nor demons. Thus and in several other ways Paracelsus helped the downfall of the scholastic medical science of his time.

Paracelsus died at Selzburg 24 September 1541.

De Candolle, Augustin Pyramus (1778-1841)

AUGUSTIN PYRAMUS DE CANDOLLE, a French botanist, was born at Geneva 4 February 1778. Having had his education at the college of Geneva, he went to Paris in 1796 and became a favourite pupil of the botanist, Desfortaines. In 1808 he became pro-

fessor of botany and director of Botanic Garden at Montpellier. In 1816 he resigned his offices and came to Geneva whose citizens founded a chair for him in 1817.

Histoire des plantes grasses (1799–1803) was his first book. His doctorate thesis was an *Essay on the medicinal properties of plants* (1804). He revised Lamarck's *Flora of France* (1805). His *Theorie elementaire de la botanique,* which is remarkable for its profoundness and which is regarded as his masterpiece came out in 1813. His *Regni vegetabilis systema naturale* (1818–21) had to be discontinued after the second volume as its plan was too vast for one man to execute. In 1824 began a more modest version under the title *Prodromus.* But even this had to be completed only after his death, by his son and other botanists. His *Organographic vegetale* (1827) dealt with the anatomy of plants and developed the doctrine of metamorphosis. This was followed in 1832 by a book on the physiology of plants.

While every botanist had yielded to the influence of the artificial system of Linnaeus, De Candolle was the first to estimate its merits correctly. In the principles of classification expounded by him in his introduction to Lamarck, he said "The natural method endeavours to place each individual object in the midst of those with which it possesses the greatest number of points of resemblance; the artificial has no other end than that of enabling us to recognise each individual plant. ... The former being truly a science, will serve as an immutable foundation for anatomy and physiology, to build upon; whilst the second ... does nothing towards enlarging the boundaries of science."

After a visit to a meeting of naturalists at Turin, De Candolle died 9 September 1841.

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SCIENCE NOTES AND NEWS

Contact Angles.—An interesting method for measuring contact angles has been described by Bikerman (*Ind. Eng. Chem.*, Anal. Edn., 1941, 13, 443) making use of the equation

$$\frac{\Delta_0^3}{v} = \frac{24 \sin^3\theta}{\pi (2 - 3\cos\theta + \cos^3\theta)}, \text{ where}$$

Δ_0 = the diameter of a minute droplet of the liquid,

v = the volume of the drop, and θ = the contact angle between air, liquid and solid.

A microsyringe is used to produce very small drops while their volume is determined by a micrometer syringe. The diameter of the contact circle is determined by measuring the diameter of the mark produced after evaporation of the liquid drops using a suitable travelling microscope. The method described, is used to measure the contact angle for water drops on built-up multilayers of soaps, on lacquered tin plate and on glass plates. The method seems to be simple as it involves the measurement of length and volume and not of the angle and the results obtained represent a more accurate average value for the contact angle. M. R. A.

Particle Size Determination by Sedimentation.—Sedimentation methods offer a means of obtaining the size distribution curves of soils. Wiegner, Kelly and others developed a simple method which consists in measuring the change in hydrostatic pressure exerted by the suspension as the suspended material separates. It was observed that the liquid from the manometer capillary entered the settling tube thereby causing a disturbance in the suspension. Kammermeyer and Binder (*Ind. Eng. Chem.*, Anal Edn., 1941, 13, 335) have improved it by using an all-glass manometer. A spoon gauge made by elongating a thin-walled bulb and then flattened on one side has been used to measure the pressure differences. The pointer movement is amplified by optical arrangements. Calibration curve is got by converting the increases in height of the liquid to increases in pressure and plotting against pointer displacements. The advantages of this method are: (1) that the final position of the pointer can be easily calculated which corresponds to complete settling, (2) disturbances caused by the flow of the liquid from the side arm are avoided and (3) a closer differentiation of particle sizes is possible owing to the high sensitiveness of the all-glass manometer. G. S.

Passivated Tinplate.—When sulphur-containing food-stuffs are packed in tin-plated cans, the insides of the cans generally become stained during the hot sterilising process. In addition, the artificial colouring matter added to certain food-stuffs get bleached by reduction by the tin. A special sulphur-resisting lacquer is often applied to the tinplate to avoid these difficulties. An alternative and simpler method of protection is described by R. Kerr in *The Tin Research Institute Publication* No. 104. This consists in passivating the tinplate with an invisible oxide film produced by treatment with a solution which is both alkaline and oxidising and contains, essentially, trisodium phosphate and sodium dichromate. Full details are given in the publication. M. A. G.

Chinese Amphibians and Reptiles.—South-eastern China has been very little explored from a herpetological point of view and for this reason the collection of Amphibians and reptiles made and described by J. L. Gressitt (*Philippine Journal of Science,* May 1941, 75, No. 1) is interesting. The collection has