individuals. There are others whose interest is only indirect; thus an amateur might make entomology his hobby, while his real interest is in the enjoyment of the excursions to the country. There is also a large group who have but little originality or interest in science for the sake of truth, but dabble into some subject expecting to take it up as an occupation later. All this is more or less creditable to these amateurs, but does not make them scientists.

The amateur scientists referred to in the article in NATURE, who not only pursue science for the interest in the subject itself and without compensation, and also put in their money to carry on their research, are different from the ordinary amateurs in having a deeper knowledge of their subject and in being experienced in the research and special study of the subject; they may be even more experienced in their special subject than many professional men of science, except the few who also make a special study of the same subject.

There is a tendency to discourage and ignore the theories and discoveries of unknown amateur scientists. A discovery should be judged only by its importance in fundamental truth. The proper understanding of Nature and the discovery of the laws of Nature is a gift that is exceedingly rare, and it should be recognised wherever found, whether in the ranks of the professional men of science or in the ranks of the amateur scientist.

Research and discoveries, however, should not necessarily be expected of all teachers of science and other professional men of science; they both render great service to science in their profession, one by the teaching of it, the other by its practical application to modern improvements and the benefit to mankind. In the meantime, a few professional men of science can render unusually great service by making discoveries in fundamental truth.

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The Planets Mercury and Venus.

THROUGH the kindness of Dr. Deslandres, I followed Mercury here last spring and summer with the 33-inch refractor, and all recent observations confirm my 1927 results with the same instrument as to the correctness of the 88-day rotation period and as to the presence of whitish atmospheric veils of low albedo, which occasionally distort and conceal the subjacent dusky areas. The axis of rotation of Mercury cannot of course coincide exactly with the perpendicular to the orbital plane, although it cannot form a considerable angle with it.

The experience gained by the use of the 33-inch refractor and the comparison of my data with those of many observers using all sizes of instruments, show that reduced diffraction in large telescopes not only broadens the dark interval between the components of double stars and Cassini's division in Saturn's ring, but that it also increases the size of all dusky planetary markings, such as the so-called seas and irregular streaks of Mars, or the belts and dark spots of Jupiter and Saturn. In the case of the minute disc of Mercury, the agency of diffraction, which causes luminous areas to encroach upon the small or narrow greyish spots, tends to bring about the extinction and invisibility of the latter. For this reason I cannot detect them with an aperture of 6 inches.

The discovery of the long rotation period of Mercury with a refractor of only 8½ inches by Schiaparelli must thus be considered as a wonderful feat of observation, and this the more so as the appearance of the dusky markings of the planet is frequently modified by the interposition of the above-mentioned whitish veils, the existence of which did not elude the acuteness of the distinguished Italian astronomer.

I have also studied the planet Venus systematically with the large instrument, but the markings seen were of such a nature as to render impossible any conclusion concerning the period of rotation of the planet.

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Laboratory Drainage.

TROUBLE with laboratory drainage is so frequent that information on any new departure may be of general interest. It is difficult to obtain a material for waste systems which will withstand dilute acids, alkalis, organic liquids, and mercury, all of which find their way down chemical drains. So far, glazed ware pipes remain the best things for general use, but can only be obtained in very short lengths, involving an undesirable number of joints. I have tried to interest one or two firms in the production of moulded drains and channels of graded silica (sand) and asbestos bound together by high silica sodium silicate, but the demand does not appear to inspire much enthusiasm for research in this direction. Thanks to a professor in one of our universities, some alloys of nickel are under test in his laboratory drainage system, with a view to the possible use of this material.

A more recent departure is the use of vulcanite, and an enterprising firm has had made a vulcanite four-inch channel ten feet long which has been in use in another institution for three months, during which short period no change is discernible; but whether such a channel would withstand the severe conditions of some organic laboratories may be open to question.

Should any reader of NATURE be prepared to follow up this subject in the interests of advancing laboratory construction, I shall be glad if he will communicate with me.

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Higher Hydrocarbons from Methane.

IN view of the publication by Fischer (*Brenn. Chem.*, **9**, 309; 1928) of the results of his experiments on the thermal decomposition of methane, to which reference is made by Messrs. Stanley and Nash in a letter published in NATURE of Nov. 10, it seems desirable to place on record the fact that the production of commercial yields of benzene by the pyrolysis of methane, without a catalyst, was proved in the Fuel Technology laboratories of the University of Sheffield about two years ago. The work forms the basis of certain claims in English Patent No. 26719 of Oct. 8, 1927.

For reasons which will appear in a forthcoming publication, I believe the production of benzene during the decomposition of methane to be through ethylene, which is an early product of decomposition, and butadiene, which ethylene yields on heating. The formation of ethylene from methane can be expressed as follows: $CH_2 \cdot H \rightarrow : CH_2 + H \cdot H$, two of the 'residues' $: CH_2$ postulated by Bone and Coward (*J. Chem. Soc.*, **93**, 1197; 1908) combining to form ethylene.

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Department of Fuel Technology,
University, Sheffield,
Nov. 12.