

intercellular spaces existing in the leaves, especially in their lower strata, than through the epidermis.

The probability that the respiratory and the assimilative interchange of gases took place by different routes was also made probable by experiments, which seemed to show that leaves exhaled carbonic acid even in bright sunshine, when they were known to be at the same time actively absorbing it. Mr. Blackman, however, is able to show by a series of very careful experiments that the stomata are practically the sole path both for the exhalation of respiratory carbonic acid and also for the absorption of the carbonic acid required by the plant in its periods of active assimilation. Not only does he do this, but by other experiments he is able to explain away the apparently opposite results obtained by earlier investigators.—*The Hospital, London.*

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ACETYLENE, THE NEW ILLUMINANT; ITS COMMERCIAL POSSIBILITIES.—It is only comparatively recently that the general public have begun to awaken to the importance of the commercial production of acetylene gas. The combustion of this gas has been described as producing something akin to real sunlight. Even the brilliancy of the arc electric light, not to mention, of course, the milder incandescent electric light, pales its fires before the burning rays of light given by this new illuminant. Now, however, if one may judge from published opinions and statements by those who are regarded as experts, the value of acetylene gas as an illuminant is to prove trivial compared with its real commercial significance. If all that is claimed for it be true, it means the cheaper manufacture of a great many substances used in the arts, which heretofore have had to be produced laboriously and expensive

ly in commercial and chemical laboratories. Says an exchange :

It would seem as though almost all the needs of man were able to be satisfied by this protean substance. The further investigation is pushed into its possibilities, the more astounding and bewildering they become. By the action of nascent hydrogen acetylene becomes ethylene, and this, on treatment with sulphuric acid and water, becomes alcohol, which, apart from its other uses, is absolutely necessary to the production of an enormous number of economic substances. In similar ways we can get such deadly poison as oxalic acid and prussic acid, while acetylene is a cheap source of the aldehyde so much used in the production of artificial essences and the manufacture of mirrors. When, therefore, it is considered that from acetylene can be derived whole systems of dyes, medicines, essences, perfumes, poisons, explosives—not to mention cheap whiskey—it will be seen that the latest product of the electric furnace has a utility out of all proportion greater than that which can be derived from its peculiar light-giving powers.—*Bradstreet's New York.*

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Fine buildings and equipment are excellent things when they can be afforded, but always out of place when they bring about the necessity of a reduction of salaries which must sooner or later lower the standard of work done. First class teachers, first class buildings and first class equipment are all important factors in a first class school, but the greatest of these is a first class teacher.—*Exchange*

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Abstract calculations are to arithmetic what picks and shovels are to railroad engineering, what hammer and nails are to architecture. Arithmetic consists of five essential operations : Addition, subtraction, multiplication, division, and *thought*, of which the last is chief. Very little time needs to be spent on the first four, as in the mathematical operation of the fifth they are all employed.