

BOTANY

Speeds Plant Growth

Spring wheat harvested 35 days after sowing; red clover in flower 38 days after seeding, a large head of lettuce grown in three weeks. These are the remarkable results obtained through the use of artificial light, heat and atmosphere, at the Boyce Thompson Institute for Plant Research at Yonkers, N. Y.

Three things are responsible for this speeded up plant growth, Dr. John M. Arthur explains in a report to the Engineering Foundation. One is bright illumination, in some cases for 24 hours a day. Another is high temperature. The third is increased amounts of carbon dioxide in the atmosphere.

The researches were made in an effort to find out how plant processes may be made more efficient. Photosynthesis, the scientist's name for the method by which light causes substances to combine, makes plant growth possible. In nature it is a very inefficient operation. Only about one per cent. of the energy that falls on the plant is utilized.

"An unusual opportunity for the efficiency expert!" Dr. Arthur says. "If only a few tenths of one per cent. could be added to the efficiency of photosynthesis, an enormous increase would be available in total energy fixed when applied to nature's vast quantity production. Over one hundred years ago, de Saussure showed that green plants not only use the small amount of carbon dioxide normally in air but can use more when available. These facts indicate a means of increasing the efficiency, yet no application was made until the recent World War. Then, under pressure of food shortage in Germany, processes were perfected by Riedel and others for scrubbing gases from combustion of coal, coke and charcoal to produce carbon dioxide. The gas was piped into greenhouses among growing plants. With high temperature and high light intensity a concentration of less than half of one per cent of carbon dioxide will about double the dry weight of plant tissue produced."

Many plants can use more light than they get from nature. If such plants are kept continually under an arlight, or if artificial light is used to supplement daylight, their growth is hastened. Wheat and clover will stand full 24 hours of light a day. The tomato, however, needs a rest, and it grows fastest with 12 hours of daylight and 6 more of artificial light.

Commercial application of these

facts is not yet in sight, Dr. Arthur points out. Every day 1500 kilowatt hours of electricity were used during the plant tests. The ordinary home seldom uses more than one kilowatt hour a day. But, says Dr. Arthur:

"From researches like these may come in time new means for producing some foods and fuels and other supplies for human needs. Economic achievement, however, yet appears remote except in small scale operations."

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GENERAL SCIENCE

Last Century Science

What about the very first number of the English weekly journal of science, *Nature*? What did the editor choose to lead off with November 4, 1869?

New things in science are popping tremendously fast now. In our effort to keep up with all the popular science writers and the untolding future of science we forget to avail ourselves of the pleasure of peeping into the past. The very musty smell of an old book in a cool library on a hot day has its scientific aspects. Let us pause to research a little into the past.

The first number of *Nature* let T. H. Huxley set the key—Huxley, grandpa of those boys, Julian and Aldous, that man who warned Darwin, "I will stop at no point as long as clear reasoning will carry me further." He translated for *Nature* Goethe's rhapsody on "Nature," apologized for its pantheism and quoted Goethe himself writing about his composition:

"If we consider the high achievements by which all the phenomena of Nature have been gradually linked together in the human mind; and then thoughtfully peruse the above essay we shall not without a smile compare that comparative with the superlative which we have now reached, and rejoice in the progress of fifty years."

Then said Huxley:

Forty years have passed since these words were written and we look again, "not without a smile," on Goethe's superlative. . . . the notions which represented Goethe's superlative are now the common-places of science—and we have a super-superlative of our own. When another half-century has passed, curious reader of the back numbers of *Nature* will probably look on our best, "not without a smile."

Now the next half-century has more than passed. In 1927 we do—we must smile as we read the index Physician Question" and "Anatom-

ical Lectures to Female Students" taking up space devoted to science.

However, we need not smile at the leading article of the second number, signed F. R. S., probably also written by Huxley. It is for us today. He says the men of science are much to blame for the dullness of science.

It is their sense of beauty that leads them to Truth, whom they discover by means of the glorious garments which she wears. But she is immediately stripped of these, and dressed in an antiquated mediaeval garb, worse than any charity-school girl. . . . no wonder that in such guise her beauty is unperceived by those who cannot pierce the veil, and that as a consequence she is slightly esteemed.

It is the duty of the "priests of science" to use the vernacular to impress the hearts of humanity. When they have learned to do this "they need not fear their deacons who will call their teaching sensational."

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ENGINEERING

Current from Wind

Use of the windmill for the generation of electricity in rural districts unconnected to a main line supply is urged by the Oxford University Institute of Agricultural Engineering.

Windmill plants can generate electricity cheaply and continuously it was proved in experiments made by the Institute. Place the windmill where nothing interferes with prevailing winds, supply it with storage batteries to act as a substitute for the wind on calm days and, presto change, there is an up-to-date electricity-generating plant. As an auxiliary to charge the batteries, engines may be used which are no longer fit for regular running, thus enabling a smaller plant to be chosen than would otherwise be necessary. Such engine sets are common throughout the country and would make good any occasional deficiency in the windmill plant.

The cost of windmill-generated electricity was shown to compare favorably with the cost of electricity from supply companies but the windmill plant does not, of course, equal the supply company in reliability and flexibility of service. The small power scheme is urged only for districts remote from a main supply line.

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Every wild animal species has its bright, average, and dull individuals, just as they are found among races of men.