years ago, under the editorship of Dr. J. McK. CATTELL, adopted as a general policy a specialization upon evolutionary topics. The American Society of Naturalists chose for itself the same field, and the *American Naturalist* is in a certain sense the organ of that society.

The last arrival in the field is the new magazine issued by the American Breeders' Association, and known as the *American Breeders' Magazine*, published in Washington under the editorship of the secretary of the Association, W. M. HAYS, assisted by the secretaries of the Plant and Animal Sections, N. E. HANSEN and H. W. MUMFORD. The first issue of this magazine has just appeared, and gives every evidence of its intention to take a dignified place among economic journals, and a modest and unassuming place among scientific magazines, thus correctly representing the unique position of the Association whose organ it is. The *American Breeders' Magazine* is being issued as a quarterly, but it is hoped by those who have it in charge that it may soon be changed to a monthly magazine. The opening number presents as a frontispiece a portrait of CHARLES DARWIN, and also gives portraits of GREGOR MENDEL and AMOS CRUIKSHANK, the latter the originator of the shorthorn cattle, and said to be the first to utilize fully the discovery of a mutation in the establishing of an important economic breed. Besides brief biographical sketches of these three men, this first issue presents papers on "Increasing protein or fat in corn," by L. H. SMITH; "New methods of plant-breeding," by GEORGE W. OLIVER; "The army horse," by CARLOS GUERRERO; "Imperfection of dominance," by C. B. DAVENPORT; "Poultry-breeding in South Australia," by D. F. LOWREY; and several articles on the breeding of deer and other wild animals by D. E. LANCE and other members of the committee on breeding wild animals. As it is the plan of the American Breeders' Association to continue the publication of its *Year Book*, the issue of this magazine will make it even more important that all those who are engaged in investigation or who are interested in matters involving genetics should become members of the Association and thus secure its publications.—GEO. H. SHULL.

**Respiration.**—PALLADIN[5] has tested the effect of several poisons on the $CO_2$ output from living plant organs and from similar tissues that have been killed by freezing for several hours. He finds that 0.09 per cent quinine hydrogen chlorid more than triples the $CO_2$ output from living stem tips of *Vicia Faba*, while it does not affect the killed ones; 0.05 per cent was far less effective on the living tissue and indifferent in the dead; and 1.0 per cent tripled the product from the living and reduced it markedly in the dead tissue. In the living bulbs of *Gladiolus Lemonia*, 8 cc. of ether per 7.5 liters of air

[5] PALLADIN, W., Ueber die Wirkung von Giften auf die Atmung lebender und abgetöteter Pflanzen, sowie auf Atmungenzyme. Jahrb. Wiss. Bot. 47:431–461. 1910.

doubled the $CO_2$ production, while 16 cc. in the same volume was less effective. Neither increased the output from killed bulbs. Ether gave little stimulation in the living bulbs of *Gladiolus Colvillii* and *Allium Cepa*, while it cut greatly the output from dead tissues. Arbutin (1 and 2 per cent) reduced considerably the $CO_2$ yield from live wheat seedlings, and very markedly that from killed ones. PALLADIN finds that the stimulative or inhibitory effect of poisons on the living tissues was not accompanied by an increase or decrease in peroxidase, but the decreased output from dead tissues was accompanied by a decrease in peroxidase. The stimulatory effect of poisons gradually disappears and toxic results soon set in if the surrounding atmosphere is displaced by hydrogen. Extreme temperatures also reverse the effect of the poisons. The author believes that the increased $CO_2$ output in the living tissues is a result of their battling against the poison, and that the ability to do battle is lost with death or with unfavorable life conditions. He concludes that the action of poisons on the respiration of dead tissues is a direct result of injury to the respiratory enzymes, while their action on living plants is indirect through the living protoplasm.

PALLADIN believes that the increased respiration is due to an increased transformation of the zymogens to active enzymes, which is also accompanied by an increased destruction of the active enzymes. For this reason the stimulated plant shows no increase in active enzymes over the control. One feels that this conclusion is not sufficiently backed by evidence.

PALLADIN[6] has also attempted to ascertain the effect of contained lipoids upon the respiration of plant tissues. This he did by extracting dried wheat seedlings for two hours with various lipoid solvents (toluol acetone, benzen, chloroform, benzin, alcohol, etc.). In general he finds that the more lipoid and therefore phosphorus-containing material the solvent extracts, the more it reduces respiration. He believes this is related to the important rôle of phosphates in zymase action. He finds, however, that the amount of reduction in respiration is not exactly proportional to the amount of lipoid extracted. He explains this in part by the fact that different solvents will extract not only different amounts, but different sorts of lipoids. In substance he also says: "When we separate the lipoids we destroy the normal protoplasmic structure. We separate from the protoplasm the cement which binds its heterogeneous parts into a whole. I have shown that even the mechanical breaking up of the plasma structure reduces very markedly the respiration of the plant tissue." He points out various other means through which these solvents may affect the respiration, such as the coagulation by alcohol. With other authors, he believes the lipoids are to be considered intermediary bodies in respiration, that is, oxygen-carriers. He would list them with his respiratory chromogens. One gets the impression that PALLADIN feels himself much more secure than he should when treading on such uncertain ground.

---

[6] PALLADIN, W., Zur Physiologie der Lipoide. Ber. Deutsch. Bot. Gesell. 28:120–125. 1910.

GALITZKY and WASSILJEFF[7] have studied the effect of boiled extract of wheat and bean seeds upon the respiration of living and killed (by treatment with acetone) wheat seedlings. In agreement with various other workers, they find that the extracts greatly increase the $CO_2$ output in both living and killed seedlings: 60 per cent in normally acid cultures, 117 per cent in neutral cultures, and 86 per cent in slightly alkaline cultures. The authors raise the question, "Is the stimulative action due to food materials supplied by the extract, or to bodies of the nature of co-enzymes?" L. and N. IWANOFF have assumed that the stimulation is due to the action of organic or inorganic phosphates on anaerobic respiration, analogous to the action of these bodies as co-enzymes for zymase. The authors find that peptone, glycerin, mannit, sodium lactate, quinic acid, sodium chlorid, and ferric chlorid have very little or no effect upon the respiration of the seedlings. Dextrose, saccharose, maltose, and sodium carbonate give a slightly increased $CO_2$ output, about 20 per cent. Arabinose and ferrous sulfate give a somewhat greater stimulation of the extracts. The authors consider it especially interesting that probable intermediate products of alcoholic fermentation, lactic acid and sodium lactate, have no stimulative effect. This is quite in contrast with conceptions of KOSTYTSCHEW. The authors are to extend the tests to various other substances, especially to phosphates, to see whether they will give the amount of stimulation shown by the extracts. One naturally wonders to what extent bacterial action may increase the $CO_2$ output. So far as methods are described, one certainly cannot be assured that such has not happened.—WILLIAM CROCKER.

**Heliotropism and geotropism.**—GUTTENBERG[8] has already shown, contrary to the earlier conception of most writers, that the effect of the geotropic stimulus is not annulled by the light stimulus, but that light of such intensity can be chosen that, when it strikes a horizontally placed orthotropic epicotyl from below, its joint action with gravity will, after various nutations, lead to the epicotyl permanently growing in the horizontal position. Compensation (placement at 45 above the horizontal) likewise results when the light of proper intensity strikes the vertical epicotyl horizontally. The intensity of light demanded to compensate gravity varies greatly with different epicotyls; while occasionally greater than one candle power, it is generally only a fraction of a candle power. RICHTER[9] called the results of GUTTENBERG into question,

---

[7] GALITZKY, KATHERINE, und WASSILJEFF, VERA, Zur Atmung der Weizenkeime. Ber. Deutsch. Bot. Gesell. 28:182–187. 1910.

[8] GUTTENBERG, H. R. v. Ueber das Zusammenwirken von Heliotropismus und Geotropismus in parallelotropen Pflanzenteilen. Jahrb. Wiss. Bot. 45:193–231. 1907.

[9] RICHTER, O., Ueber das Zusammenwirken von Heliotropismus und Geotropismus. Jahrb. Wiss. Bot. 46:481–502. 1909.