Nature provides an automatic compensating mechanism, such that if material progress is too rapid, suffering results which accelerates spiritual progress.

And in another place:

Civilization contains innate self-stabilizing influences. Society has certain problems to solve and definite lessons to learn. The function of science is to speed up this learning process. If modern wars seem more terrible, it is because we are learning our lessons faster and overcoming more rapidly those obstacles to human progress which must be met in any case.

Certainly no one will doubt that scientific research provides means which may be used for human progress, but that there is any automatic mechanism to insure that these means will be so used is a debatable thesis, doubted by many thoughtful and well-informed people. It was a good while ago but already within the age of modern technology that John Stuart Mill wrote: "Hitherto it is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being." Most of us would doubtless count this an exaggeration. But I think we should find it harder to dismiss the opinion of Henry George, that "the new forces [of material progress], elevating in their nature though they be, do not act upon the social fabric from underneath, as was for a long time hoped and believed, but strike it at a point intermediate between top and bottom. It is as though an immense wedge were being forced, not underneath society, but through society. Those who are above the point of separation are elevated, but those who are below are crushed down." And indeed one can not help wondering whether what the world has now would pass for civilization with Socrates, let us say, or Pascal or, for that matter, with any barefoot and illiterate South Sea Islander caught between the bombs and shellfire of the technically advanced nations.

But, in any case, it is to be hoped that "Atoms in Action" will have many new readers. They will find that nature is not niggardly of either her secrets or her riches, and the world can be made incomparably better by knowledge, employed with good-will. And if, like this reviewer, they can not share Professor Harrison's optimistic belief that this will happen automatically, they may be moved themselves to try to make it come true.

R. T. Cox

THE JOHNS HOPKINS UNIVERSITY

ORGANIC SYNTHESES

Organic Syntheses. Vol. 24. An annual publication of satisfactory methods for the preparation of organic chemicals. NATHAN L. DRAKE, editor-in-chief, with an editorial board and an advisory board. Pp. 119. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1944. $2.00.

THE syntheses described in this new volume of this important series are the following: Acenaphthenequinone, Aminoacetal, 4-Amino-2,6-dimethylpyrimidine, *dl-alpha*-Amino-*alpha*-phenylpropionic acid, 4-Amino-1,2,4-triazole, Benzoyl cyanide, Benzoylformic acid, *tert.*-Butyl acetate, *o*-Chlorobromobenzene, ω-Chloroisonitrosoacetophenone, 2-Chlorolepidine, 1-Chloromethylnaphthalene, Coumarilic acid, Cyclopropanecarboxylic acid, *nor*-Desoxycholic acid, 3,12-Diacetoxy-*bisnor*-cholanyldiphenylethylene, γ-Di-*n*-butylaminopropylamine, 2,6-Dichloroaniline and 2,6-dibromoaniline, Diphenyldiazomethane, Ethyl diazoacetate, Ethyl hydrazinecarboxylate and diaminobiuret, Ethyl-N-tricarboxylate, Glyoxal bisulfite, 4(5)-Hydroxymethylimidazole hydrochloride, 4-Methylcarbostyril, 4-Methylcoumarin, Methyl pyruvate, *o*-Nitrobenzaldehyde, *p*-Nitrobenzyl acetate, *p*-Nitrobenzyl alcohol, Phenylmethylglycidic ester, 1-Phenylnaphthalene, *alpha*-Phenylpropionaldehyde, Selenophenol, Sorbic acid, Undecyl isocyanate, Vinylacetic acid.

The concluding subject index covers volumes 20–24.

In other respects the volume is exactly like its predecessors, Vol. 23 having been reviewed somewhat more fully in SCIENCE of August 27, 1943, page 200.

MARSTON TAYLOR BOGERT

COLUMBIA UNIVERSITY

REPORTS

THE NEW YORK ZOOLOGICAL SOCIETY

IT is extraordinarily encouraging how the affairs of the Zoological Society progress even during the stress of this war. Public interest, together with the moral and financial support coming in from many quarters, is evidence of the importance and permanence of the things that this institution stands for and of its potentialities in the future.

[1] Address of Fairfield Osborn before the New York Zoological Society, January 9, 1945.

Usually at these meetings it is the president's duty to report to the members as to the past year's happenings. With your permission I shall only do this most briefly and then go on to consider some plans and ideas for the future.

THE YEAR 1944

The year 1944 again gave us confidence to believe that our services provided real contributions to public

morale, recreation and education in this time of war. More than 2,100,000 people visited the Zoological Park despite the curtailment in automobile driving. Every service, exhibit and park area was fully maintained. This was due to the energetic and intelligent work of our staff together with all members of the organization. Services to public schools show a higher number of school classes serviced with films and slides than in any previous year. Research work of definite value to the war effort, as well as to pure science, was accomplished. Specific designs for the future development of the Zoological Park and for a new aquarium have been brought to the final blueprint stage, awaiting execution in those days of peace which we must continue to pray may not be long deferred. In these matters we have received the finest kind of cooperation from the commissioner of parks and from his staff.

Lastly, we ended the year in good financial order, with our expenses within our income and with reserves established which will help to meet the many demands that will fall upon us in the future.

Books and Films

Outside the immediate physical areas of our institution we have been able, together with the men of eight other scientific and educational institutions, to contribute towards the preparation of a series of books on the natural history of the Pacific. Preliminary announcement of this project was made at last year's meeting. "The Pacific World," the first of this series, was published during last summer in two editions—one for the Armed Services, the other for the general public. This first general book has already gone to several printings. It is being followed by a series of detailed books on various branches of zoology and natural history, written by men eminent in their special fields. Those of us who have had the opportunity of taking part in this enterprise are very grateful for it and believe that this Pacific World Series will prove an important contribution to zoological and natural history literature.

In passing, those of you here to-night who attended the 1942 meeting will probably recall seeing a film we had just made on bird migration. This film was made before war started, and due to the war we have not been able to work on any others. However, you will be deeply pleased, I am sure, to learn that this film has had a tremendous success—has been shown throughout the country, in Canada and Australia, as well as in South and Central America. Further, arrangements have recently been concluded for its distribution in Europe as well as in China, both through the theaters and through Government agencies. It provides a promise for what we shall look forward to accomplishing in the field of educational films when conditions again permit.

Tropical Research Department

To the long list of his many remarkable accomplishments, Dr. William Beebe is now about to add another. Because of the great interest aroused in Venezuela by the work of Dr. Beebe and his staff two years ago, that Government has turned over to the Tropical Research Department a building which will be used for laboratory purposes, situated west of Caracas in Venezuela. The establishment of this station is being substantially aided by the Standard Oil Company of New Jersey and by the Creole Petroleum Corporation (of Venezuela).

This property, known as Rancho Grande, is on a mountain-top, 3,000 feet up in the midst of the undisturbed jungle of a preserved national park. Dr. Beebe and his staff will spend six months in 1945 at this wonderful locality. Studies will include the conservation of wild life in the tropics and the habits of living creatures in the jungle. This will be the forty-fifth expedition of the department. A series of lectures will be delivered in the principal cities of Venezuela by Dr. Beebe and his staff. This project is the kind of work that will contribute, in the best possible sense, to better understanding between this country and the other republics of this hemisphere.

Zoological Park—New Projects

Now as to immediate as well as long-range future plans. On Members' Day, next June, we shall open a new information and educational service unit in the Zoo. This will be a place where serious-minded visitors, who really want to add to their knowledge of animal life, can be intelligently served. We are more and more impressed with the fact that the public comes to learn as well as to have a good time. I should add here that the plans for the new aquarium include similar elements for serving the public as richly as possible. In addition, we shall have ready for next spring's members' meeting two new exhibit units—one for otters, the other for raccoons. These are to be made free of bars or wire and in naturalistic settings.

Establishment of Department of Insects

Of much greater importance—we are going to establish this year a new department, namely, that of insect life. It is a curious fact that we as a zoological society, having dealt with mammals, birds, reptiles and aquatic life, have not heretofore had a department for the exhibition and study of insects and allied forms of life. We do not need to remind ourselves that insects are far the most numerous of all living things

on the face of this earth. In many respects they affect man's life, for example, in health and agriculture, far more directly than any other forms. This program contemplates the eventual establishment of a major building in the Zoo. Here there will be shown living insects of many varieties, native types as well as those from other parts of the world. Further, it will be our aim to build up this project to a point where it will become a center of study as well as public information regarding these fascinating, sometimes beautiful yet frequently troublesome and even harmful forms of life.

SCIENTIFIC RESEARCH

Another aspect of our thinking for the future involves the widening and extension of our present work in the fields of research; more specifically, in comparative physiology, pathology, anatomy and bacteriology, together with studies in the field of animal behaviorism. To this end there has been established since our last meeting a scientific advisory council, of which we are honored to report the following have become members:

Dr. Alfred E. Emerson, Department of Zoology, Chicago University.

Dr. Alan Gregg, director of the medical sciences, Rockefeller Foundation.

Dr. K. S. Lashley, director of the Yerkes Laboratories of Primate Biology.

Dr. John S. Nicholas, Sterling professor of zoology, Yale University.

Dr. George M. Smith, Yale University School of Medicine.

Dr. A. Raymond Dochez, of our own board of trustees, of Columbia University and of the Committee on Medical Research of the Office of Scientific Research and Development.

As one of our council members expresses it, "the Zoological Park as well as The Aquarium have a unique opportunity for the study of a wide range of living animals quite beyond the scope of universities, museums or other types of research institutions." Of course, as you know, our institution has since its earliest years done a very large amount of valuable work in numerous fields of scientific research. But we can well plan to broaden our activities. We are aiming specifically at a future establishment which can be used as a headquarters, so to speak, for scientists and students from other institutions. This could well be called a "Research Center of Animal Life and Health." As another of our new council members expresses it:

As you can see, I am taking this whole situation very seriously as a possible means of enlarging the scope in our modern day Zoologist which I feel has become entirely too limited and which has produced specialists who do not have the broadness of view to see the interrelation of their own field with those others which are just as important in securing our knowledge of the animal, what it does and how it works.

CONSERVATION

We need to face the unpleasant fact that there are two world-wide wars going on—one, man's destruction of man; the other, his destruction of the "living resources" of nature, upon which his own existence depends. What are these faint voices of foreboding? What are these whispers in the air which seem to say—"We are losing our forests"—"We are losing our soils"—"We are losing our waterways." What of it?—we say—there's plenty left. But the facts speak differently, for forest and soil and water are all interrelated and the destruction of the one element leads to the disappearance of the others. It can be said without hesitation that the velocity of destruction of these "living resources" not only in this country but in many parts of the earth is infinitely greater than is generally realized. It would be well indeed if these matters were made the subject, to a far greater degree than at present, of international collaboration. The declining land productivity of a nation can push it into war as readily as some other cause.

You will recall that the charter of our society provides that one of our major activities shall be that of work looking towards the protection of wild animal life. The history of the society in this field is a very fine one. We are trustees of the Permanent Wild Life Protection Fund, established by Dr. William T. Hornaday with the help of Madison Grant and others. Those were fighting days and among the many accomplishments in which this society can claim a leading part, were the saving of the American bison or buffalo from extinction, the prohibition of the sale of native wild game in New York State, the enactment of tariff laws forbidding the importation of wild birds' plumages for millinery purposes, the establishment of the first game act in Alaska, assistance in legislation which eventually developed into the International Migratory Bird Treaty between Great Britain, Canada and the United States. Even during the last year Jean Delacour of our staff gave valuable assistance to the United States Government looking towards the saving from extinction of the trumpeter swan, the largest of the world's wild fowl.

Now the thoughts that have come to us recently regarding our future conservation activities arise from a realization that the continuing existence of all wild animal life depends upon the maintenance of the forests, soils and streams in this country and in other parts of the world. These living resources are the basis for the preservation not only of wild animal life but of man himself. We therefore have come

to see that the society should give its active aid towards a better public understanding of what is going on. The joint project between the State of New York and our society for the post-war establishment of a conservation exhibit in the Zoological Park can well serve as a springboard for the educational services which we hope to accomplish in this most important field. At the risk of reiteration, allow me to say, in somewhat different terms, that the preservation of wild animal life not only in America but in other parts of the world depends upon preserving the habitats and living places in which animal life can be expected to survive. We hear a lot of talk these days to the effect that if our soils run out the food chemists will step in and feed us on synthetic foods and vitamins. This is a questionable possibility, and even though it could be accomplished, life would indeed be tasteless and colorless. In any case, we can not go around feeding vitamins to wild animals. Consequently, from now on this institution intends to do everything in its power to contribute to the preservation of forests and soils both here and in other countries upon which man and wild animal life alike must depend for their future existence.

SPECIAL ARTICLES

THE DEAMINATION OF "MARFANIL" AND RELATED COMPOUNDS[1]

CONSIDERABLE interest has been manifested recently both abroad[2] and in this country[3] in the use of "Marfanil" homosulfanilamide as a topical adjuvant in the treatment of gas gangrene. The general consideration of the compound (p-amino-methylbenzenesulfonamide, first synthesized by Miller, Sprague, Kissinger and McBurney[4]) as a "sulfa" drug has tended to cloud a proper consideration of its action and inactivation.

Recently we included "Marfanil" in a study of the relationship of structure to deamination of a series of substituted benzyl and phenylethylamines by amine oxidase. Because of the timeliness of the study with regard to interest in the compound, the fact that it is relatively ineffective when administered by mouth but is active when used topically, and since Evans, Fuller and Walker[2] have postulated very recently that some such mechanism plays a part in the inactivation of "Marfanil" in the body we have thought it worth while to publish a note on our results as they pertain to this compound.

The procedure was essentially that reported by Beyer.[5] The Warburg respirometer was used for the measurement of the oxygen taken up in the course of the deamination of the compounds. Guinea pig liver homogenates were the source of amine oxidase. The tests were conducted in the presence of cyanide using M/23 or M/16 concentrations of the amines before their dilution by other contents of the flasks. The compounds tested were tyramine, benzylamine, p-sulfamilphenylethylamine and "Marfanil." Each vessel contained 1.5 cc 25 per cent. guinea pig liver homogenate in M/8 phosphate buffer, pH 7.2; 0.1 cc M/15 NaCN; 0.9 cc M/4 phosphate buffer, pH 7.2. The center well contained 0.2 cc 20 per cent. KOH plus 0.1 cc M/15 NaCN. The substrates were placed in the side arms. The reaction was run at 37° C in an

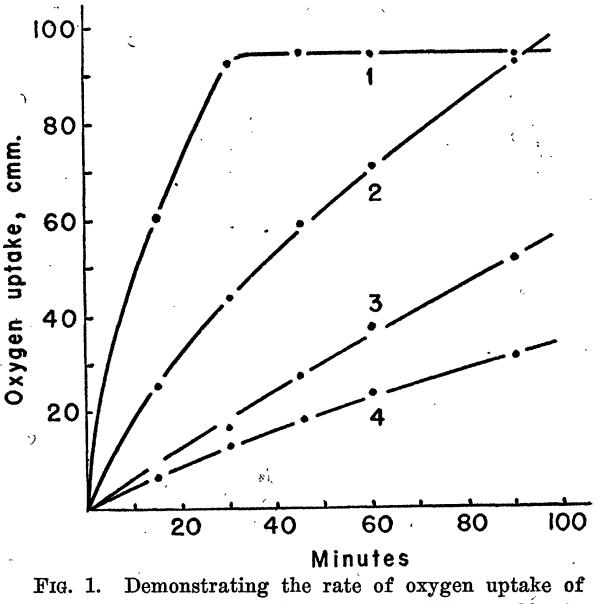

FIG. 1. Demonstrating the rate of oxygen uptake of (1) tyramine hydrochloride, M/23; (2) p-sulfamilphenylethylamine hydrochloride, M/16; (3) benzylamine hydrochloride, M/16; (4) "Marfanil" hydrochloride, M/16. 0.2 cc of each substrate was used.

[1] From the Department of Pharmacology, The Medical-Research Division, Sharp and Dohme, Inc., Glenolden, Pa.

[2] (a) J. Klarar, *Klin. Wschr.*, 20: 1250, 1941. (b) A. Fleming, Special report on tests with Marfanil prepared for Medical Research Council, 1943. (c) C. N. Robinson, *Lancet*, 2: 351, 1943. (d) G. A. G. Mitchell, W. S. Rees and C. N. Robinson, *Lancet*, 1: 627, 1944. (e) D. G. Evans, A. T. Fuller and J. Walker, *Lancet*, 2: 523, 1944. (f) G. Domagk, *Klin. Wschr.*, 21: 448, 1942; *Dtsch. Med. Wschr.*, 69: 379, 1943.

[3] (a) E. A. Bliss and H. C. Deitz, *Jour. Bacteriol.*, 47: 449, 1944. (b) C. A. Lawrence, *Jour. Bacteriol.*, 47: 452, 1944. (c) E. A. Bliss and H. C. Deitz, *Bull. Johns Hopkins Hosp.*, 75: 1, 1944. (d) C. M. McKee, D. M. Hamre and G. W. Rake, *Proc. Soc. Exp. Biol. and Med.*, 54: 211, 1943. (e) D. M. Hamre, H. A. Walker, W. B. Dunham, H. V. van Dyke and G. Rake, *Proc. Soc. Exp. Biol. and Med.*, 55: 170, 1944.

[4] E. Miller, J. M. Sprague, L. W. Kissinger and L. F. McBurney, *Jour. Am. Chem. Soc.*, 62: 2099, 1940.

[5] K. H. Beyer, *Jour. Pharmacol.*, 71: 151, 1941.