poisoning is a result of a disturbance in the dual function of hemoglobin. Under natural conditions the tissues receive their full supply of oxygen by the reduction of oxyhemoglobin, for the plasma holds very little oxygen in solution. But with excessive oxygen pressure the plasma holds enough oxygen in solution to provide the full quota. As a result —oxyhemoglobin is not reduced, no base is provided to carry the acid from the tissues which necessarily must turn more acid.

My theory of respiratory control may now be summarized.

Changes in the hydrogen ion concentration of the respiratory center rather than of the blood constitute the prime factor in respiratory control.

Since the supply of oxygen determines the absolute and relative amounts of lactic acid and carbon dioxide formed in living tissues, and since it controls the efficiency of transport and elimination of acid, it constitutes the normal and indirect regulator of pulmonary ventilation.

The effects of lactic and carbonic acid are additive. They are exerted indirectly by way of the blood from the tissues, and more directly through their formation in the respiratory center itself.

Diminished oxidation in the respiratory center leads to an accumulation there of the relatively poorly diffusible lactic acid in a relatively poorly buffered cytoplasm and lymph, no longer fully protected by the potential alkalinity of the blood, the dual function being disturbed by the diminution in the reduction of hemoglobin and the liberation of alkali as it passes through the center.

By virtue of its own metabolism and its extreme sensitivity to minute changes in its own hydrogen ion concentration the respiratory center is sensitive to minute changes in its own oxidations, and, therefore, to changes in the tension of oxygen in the arterial blood.

The capacity of the center to respond to changes in the arterial carbon dioxide tension consequent on fluctuations in the general metabolism, however, must also be a factor.[3]

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SCIENTIFIC EVENTS

THE TOTAL ECLIPSE OF THE SUN OF JANUARY 14

THE January issue of *Popular Astronomy* gives an account of the various expeditions which have gone to Sumatra to observe the total eclipse of the sun of January 14. This eclipse promises to be well observed, although the path of totality lies across a part of the globe where there are no established observatories. The eclipse will begin at sunrise in East Africa and the moon's shadow will pass across the Indian Ocean, passing over a small island, Seychelles, about 700 miles east of the African coast, thence across the islands of Sumatra, Borneo and Mindanao, the southernmost one of the Philippine group, the eclipse ending at sunset in the Pacific Ocean.

Most of the observing stations will be grouped on the Island of Sumatra, where the observing conditions appear to be the most favorable, the duration of totality being upwards of three minutes. Unfortunately the maximum duration of 4 minutes 11 seconds occurs in mid-ocean. There will be three expeditions from the United States and one each from England, Australia, Germany, Holland, Italy and Java.

The American parties are: The U. S. Naval Observatory party, in charge of Captain F. B. Littell, including Professors George H. Peters and George M. Raynsford, astronomers in the Naval Observatory, and Dr. John A. Anderson, of the Mount Wilson Observatory. Their observing station will probably be at Tebing Tingge, Sumatra. The Sproul Observatory party, consisting of Director and Mrs. John A. Miller; Dr. Heber D. Curtis, director of the Allegheny Observatory, with Mrs. Curtis and Baldwin Curtis; Ross W. Marriott and Dean B. McLaughlin, of the Sproul Observatory; Adrian Rubel and Wilson M. Powell, seniors at Harvard, and Lamont Dominick, of New York. Their observing station will probably be at Benkoelen, on the west coast of Sumatra. The Harvard party, consisting of Dr. H. T. Stetson, director of the Harvard Astronomical Laboratory; Dr. W. W. Coblentz, physicist of the U. S. Bureau of Standards; Mr. Weld Arnold and Mr. W. A. Spurr, Harvard students. Their station will be at or near Benkoelen.

Dr. Horn d'Arturo, with an Italian expedition, will be stationed in Somaliland, near the east coast of Africa.

The English expedition sent to Sumatra by the "Joint Permanent Committee" will probably be at Benkoelen, a former British naval station. The party consists of Messrs. G. E. Barton, C. R. Davidson, F. J. M. Stratton, F. W. Aston and Colonel J. Whaley Cohen.

The Australian party under Mr. Z. Merfield, of the Melbourne Observatory, will probably be stationed at Benkoelen.

Professor Voûte from Lembang in Java will be near Palembang, north of the mountainous ridge that forms the backbone of Sumatra.

An expedition from the Royal Academy of Science of the Netherlands plans to occupy a station at Ta-

[3] Postgraduate lecture delivered before the Associated Anesthetists of U. S. and Canada, Atlantic City, May 26, 1925. (For references to original articles consult Gesell, *Physiological Review*, 1925, V, p. 551.)

langbetoetoe, about 10 miles northwest of Palembang. The party will consist of the following: Dr. J. van der Bilt, Utrecht Observatory; Dr. M. Minnaert, Helio-physical Laboratory, Utrecht; Dr. W. J. H. Moll, Department of Physics, University of Utrecht; Dr. A. Pannekoek, University of Amsterdam, and Miss J. C. Thoden van Velzen, graduate student of the University of Amsterdam.

It is reported also that the Einstein Foundation and the Potsdam Observatory are sending an expedition to Sumatra under the direction of Dr. E. F. Freundlich to secure observations for further study of the Einstein deflection of light rays in a gravitational field.

NATIONAL CONFERENCE ON OUTDOOR RECREATION

IN a letter written in April, 1924, President Coolidge appealed for nation-wide support of and participation in outdoor recreation as vital to the maintenance and development of American ideals. On the advice of a committee of cabinet members to whom the subject was referred, the President called a conference in May in which 128 national organizations participated. These were such as felt the use of the resources of the United States in land, water and wild life essential for the prosecution of their work.

The permanent organization effected at this first conference is based upon the President's committee, consisting of: *Chairman,* Hon. John W. Weeks, Secretary of War; Hon. Hubert Work, Secretary of the Interior; Hon. W. M. Jardine, Secretary of Agriculture; Hon. Herbert Hoover, Secretary of Commerce; Hon. James J. Davis, Secretary of Labor; *Executive Secretary,* Hon. Dwight F. Davis, Assistant Secretary of War.

With them is intimately associated the executive committee of the conference representing the various agencies and organizations cooperating in the movement. This committee consists of: Chauncey J. Hamlin, *chairman;* John C. Merriam, *vice-chairman;* Theodore Roosevelt, *honorary vice-chairman;* George Bird Grinnell, *honorary vice-chairman;* Vernon Kellogg, *secretary;* George E. Scott, *treasurer and chairman of Finance Committee;* Mrs. Herbert Hoover, Gustavus T. Kirby, Colin H. Livingstone, Barrington Moore, John Barton Payne, Charles Sheldon, Mrs. John Dickinson Sherwood, George Shiras, 3d, William A. Welch.

A group of departmental committees cooperates with the standing committees on education, human relations, playgrounds and athletic activities, land policies and wild life. The objective of the organization is the establishment of a national policy to unify and support the activities of the many federal, state, municipal and unofficial agencies striving to develop the recreational resources of the country. As a necessary feature of its work the conference proposes to promote the preservation and proper use of national resources. In the discharge of the functions of the conference the executive committee endeavors to elucidate broad policies and encourage special projects in line with these policies. It has been able to secure some financial support for administrative work and special grants for individual projects. It has published a few bulletins and has distributed other literature to express in authoritative fashion its purpose and policies. One of the most recent of these pamphlets covers the organization and program of work for 1924–1925. This is so remarkable a record, especially in view of the newness of the movement and of the limited funds at its disposal, that an outline of its contents is appropriate.

The program includes thirty projects of major importance in the field of conservation, each one of them intimately related to outdoor recreation. Under the direction of the general council, composed of one hundred men and women, leaders in the fields of recreation and conservation, each approved project is worked out by a special committee of those intimately related to the topic. Among the projects are: A survey of municipal and county park systems of the United States; recreational surveys of state lands and of federal lands; recreational value of highways; wild life legislation and administration; recreational needs of industrial workers; natural preserves; the establishment of national recreation areas; administration of the unreserved and unappropriated public lands; recreational values of waterways (aquatic pollution, and also drainage). Some of the projects have secured funds for their prosecution and are well advanced; others are still seeking financial support. But the record of actual achievement reflects credit on the sponsors of the movement.

A second conference has just been called for January 20 and 21 in Washington. The constituent organizations are invited to lay before this meeting studied conclusions on outdoor recreation and the conservation of wild life resources. The principal objects of the conference will be to consider federal and state responsibilities in outdoor recreation; to submit a national program for 1926 for the endorsement of the President's committee; and to make definite reports of the progress of surveys and other committee work. By virtue of its long and active interest in problems of conservation, the American Association for the Advancement of Science is deeply concerned in the work of the conference.

HENRY B. WARD

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