WEATHER FORECASTS

IN the issue of SCIENCE for May 8, page 479, there is a little slip in the item "Weather Forecasts," by J. D. Davidson. To disprove the notion that "the air is heavy with moisture" when it is going to rain, the first reason given is "because of the molecular weights of water and of the hydrogen-oxygen mixture." Presumably this should have read "nitrogen-oxygen" mixture.

The erroneous idea that moist air is heavier than dry air probably is due in part to the assumption that air absorbs moisture very much as a sponge absorbs water, and that moist air, therefore, should consist of the original volume of air plus the added water vapor and should weigh more than the dry air alone. What actually occurs, of course, is that the water vapor displaces an equal volume of air. Since water vapor is lighter than air any mixture of the two will weigh less than the same volume of dry air under the same condition of temperature and pressure.

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PER CENT.

DR. ELLIOTT[1] has made a much needed plea that instead of using the ambiguous term "per cent.," authors should indicate exactly what they mean when they state the concentrations of their solutions. In this connection it might be well to mention the official sanction which has been given by the U. S. Pharmacopoeia to the usually more useful definition of the term per cent. The eleventh edition of the U.S.P. defines it for solutions of solids or gases in liquids as grams per hundred cubic centimeters of solution, and for liquids in liquids as cc per 100 cc of solution, when not otherwise qualified.

Another source of confusion, not mentioned by Dr. Elliott, is the use of per cent. to refer to dilutions of a concentrated solution. A solution of HCl prepared by diluting 10 cc of conc. HCl to 100 cc with water, is not a 10 per cent. solution (or even a 1:10 solution).

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HEALTH AS A NATIONAL ASSET

IN the magazine, *Britain To-day,* which apparently serves the purpose of promoting amity and cultural relations among English-speaking people, Sir George Newman, formerly chief medical officer of the Ministry of Health, published an article on "Health as a National Asset." In this article he states that modern English medicine was mainly established by seven particular events, among which he lists the discovery of anesthesia by Humphry Davy and Simpson.

[1] K. A. C. Elliott, SCIENCE, n.s., 95: 123, 1942.

It happens that both Davy and Simpson were Britishers and both contributed materially to the advancement of science and medicine. Davy, who at the age of nineteen was employed in the laboratory of the Pneumatic Institute of Thomas Beddoes in Clifton, made some interesting observations on the recently discovered gases—carbon dioxide and nitrous oxide. He used nitrous oxide on various animals, as well as on himself, and observed the pleasant feeling of inebriation as well as the suppression of pain perception resulting from the inhalation of this gas. Due to its exhilarating actions he very properly termed nitrous oxide as laughing gas and remarked that "as nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used to advantage during surgical operations in which no great effusion of blood takes place." (1799.)

It may be added that Davy's chief, Beddoes, made the same observation concerning ether—an observation which was amply confirmed by Faraday and other British and American observers. It is fair to state, however, that these isolated observations remained mere scientific curiosities and remained unheeded for a long time by surgeons in general and the British medical profession in particular and that they have not accomplished what Sir George Newman implies—the establishment of modern English medicine.

The other name mentioned by Sir George Newman is that of Sir James Young Simpson. Simpson was a well-known obstetrician and woman specialist who first used ether to alleviate the suffering of child-birth after ether had been successfully used in America by a number of surgeons and introduced into the British Isles by Bigelow. Simpson is also responsible for the introduction of chloroform into the practice of surgery after its action in animals had been discovered by the great French physiologist, Flourens.

These very interesting observations and discoveries have little to do with the discovery of anesthesia for surgical operations, which is a purely American contribution. Whether the credit for this great discovery should be given to Crawford W. Long, of Jefferson, Ga., or to William T. G. Morton is a debatable question, although it is certain that Long preceded Morton but that Morton had the good fortune of having demonstrated the efficacy of ether in the operating room of the Massachusetts General Hospital to the satisfaction of the leading surgeons of the day (October 16, 1846).

It is the American discovery of anesthesia and its successful demonstration by Morton that influenced English and other medicines, because within a year after this demonstration ether was used throughout the civilized world and "strong men" were no longer needed to hold down the tortured, struggling patients

during operations. American pharmacologists and physicians will rightly wonder where Sir George obtained his information of the discovery of anesthesia and whether his particular brand of information did a service to the cause of the Anglo-American scientific alliance.

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CEMENTING SINO-AMERICAN FRIENDSHIP

IN the April 17 issue of SCIENCE was an appeal by Morris F. Shaffer to cement the bonds between Chinese and American scientists the same as is being done between American and British scientists. In the spirit of this appeal I recently turned over to a Chinese student of algae a number of reprints on subjects in his field. His deep appreciation of this contribution to the rebuilding of his working library, which was lost to the Japanese in Hongkong, indicates a concrete way American scientists can express their desire to "preserve the scientific heritage of the whole world against the barbarism and obscurantism of Fascist ideology."

Few scientists keep all the reprints and other scientific publications which they receive. This discarded material, however, is a potentially valuable nucleus for the rebuilding of private and institutional libraries now lost or to be lost or destroyed as a result of the present war. As China could live on what America wastes, so Chinese scientists could thrive on what we throw away. Because the nation-wide campaign to gather waste paper may be instrumental in destroying much potentially valuable scientific literature, it would seem appropriate for all internationally minded scientists to begin now to lay aside the material they do not want so that it may be assembled and put to use at the end of the conflict now raging. There is at present no organization receiving and storing such unneeded literature for future distribution, but if every one will make such an accumulation, surely some organization will eventually take over the task, and this material will become a useful tool in the rebuilding of a better world and in cementing the ties between American and Chinese scientists.

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QUOTATIONS

CONTRIBUTIONS TO SCIENCE OF THE JOHNS HOPKINS UNIVERSITY

A NEW and striking picture of the scientific leadership of the university is offered by a survey of "American Men of Science," a biographical dictionary containing in its latest edition 28,000 names, selected for proven scientific achievement.

By a nation-wide vote, about five per cent. of those named have been starred for special distinction. Taking chemistry as representative of the sciences, one finds that stars have been awarded to 209 men who have received their doctor of philosophy degree at American educational institutions. Of these 209, 165 received their degree at privately endowed institutions and only 44 at state-supported universities.

Five institutions alone boast 126, or substantially more than half, of the starred names. And of these five, Harvard, Chicago, Yale, Columbia and Johns Hopkins, Johns Hopkins is the highest! Johns Hopkins has 31, Harvard 28, Chicago 23, Yale 23, and Columbia 21.

That the Hopkins' scientific leadership has been felt long in America's key industries is no secret. The first laboratory for research on petroleum was started by a Hopkins graduate. Other Hopkins scientists since then have devoted their efforts to improving upon refining processes.

In addition, an increasing amount of time now is being devoted by Hopkins men to fundamental problems of the petroleum industry, such as studies upon the origin of petroleum and the problem of possible exhaustion of reserves: new and unexpected methods are being discovered for producing high-grade gasoline from agricultural products.

The mechanism of the cracking process is being examined and the applications of catalysis to the production of better fuels and lubricants are being considered. In the present emergency, especial emphasis is being placed by Hopkins researchers upon the production of improved aviation fuels, usually by the processing of low-grade fuels, and upon the study of processes of wear and corrosion, which attack the life of military machines.

Other alumni are working hard on the exploitation of coal-tar and petroleum by-products, pharmaceutical products, the food industries, and in special applications, such as solvents, lacquers, refrigerants, antifreezes, explosives, flavors, perfumes, fertilizers, insecticides, dyes and photography.

Much research, in fact, is going on at the Homewood campus, itself. So secret are these studies and so vital to the national security that armed guards now patrol the grounds surrounding the chemistry and physics buildings.

Hopkins graduates and the university's faculty alike are playing an important role in America's all-out war effort.—*The Johns Hopkins University Gazette.*